Tennessee Statewide Material Characterization & Recycling Study

Department of Environment & Conservation

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02224033.00 | May 11, 2026

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1 EXECUTIVE SUMMARY

The State of Tennessee commissioned this statewide waste characterization study to establish an updated baseline for materials management planning and to identify the highest-impact opportunities to prevent waste, expand diversion, and improve recycling system performance. Field activities were completed at 10 solid waste facilities across Tennessee's grand divisions. For Municipal Solid Waste (MSW), 390 samples collected from April 2025 through March 2026 were manually sorted into 10 major material categories and 47 material types. Reported results reflect statewide averages derived from the sample set, with associated variability measures (including confidence intervals) to support interpretation and planning.

The Tennessee Statewide Material Characterization and Recycling Study provides a current, decision-grade baseline on what materials are being disposed and managed statewide. Additionally, this study provides insight on the opportunities for material diversion and alternative processing and what it means for program design, infrastructure investment, and policy priorities.

OVERALL STATEWIDE MSW COMPOSITION

The overall statewide MSW composition results (summarized in **Exhibit 2** and detailed in **Table 4**) show that organics and paper dominate Tennessee's disposed waste stream. Combined, these two categories represent 56.1 percent of MSW by weight, indicating that most disposed materials are potentially divertible through a combination of organics management (food waste prevention, donation, composting/anaerobic digestion) and stronger paper/cardboard recovery.

Across all statewide MSW samples, the five most common material types by weight were:

- Wasted Food – Edible (15.1 percent)
- Old Corrugated Cardboard (7.2 percent)
- Compostable Paper (6.4 percent)
- Textiles and Shoes (5.2 percent)

These leading material types indicate that (1) food waste is the single largest disposed material component, (2) fiber-based packaging (especially corrugated cardboard) remains a significant opportunity for additional recovery, (3) food-soiled/compostable paper represents a meaningful portion of disposed materials that is generally not suitable for traditional paper recycling, and (4) textiles are a persistent and often under-addressed component of the disposed stream.

KEY INSIGHTS FROM STATEWIDE RESULTS

- **Residential and commercial streams are compositionally similar at the category level.** The report notes that organics and paper account for 55.0 percent of the residential MSW stream and 55.0 percent of the commercial MSW stream. This reinforces that statewide diversion gains will require strategies that work across both sectors, while still recognizing material-type differences within each sector.

- **Material-type priorities differ by sector.** Residential MSW is comprised of wasted food (edible) at 14.5 percent, followed by "Other" (8.8 percent), compostable paper (6.6 percent), paperboard (5.3 percent), and fines (5.1 percent). Commercial MSW is comprised of wasted food (edible) at 15.9 percent, followed by old corrugated cardboard (10.6 percent),

compostable paper (6.2 percent), "Other" (5.6 percent), and textiles and shoes (5.4 percent). In practical terms, commercial diversion strategies should heavily emphasize cardboard capture and food waste programs in food service and hospitality settings, while residential strategies should pair food waste prevention/diversion with packaging-focused education and system design that reduces small-material loss to fines.

- **Most disposed MSW is residential by tonnage.** Gate survey results summarized in the report indicate an average statewide split of 63.1 percent residential and 36.9 percent commercial (based on surveyed inbound loads). This suggests that statewide outcomes will be strongly influenced by residential service access, participation, and correct set-out behaviors—while targeted commercial programs remain essential for capturing high-volume generators of corrugated cardboard and food waste.

IMPLICATIONS AND PRIORITY OPPORTUNITIES

The statewide composition results point to a small number of material groups that drive the majority of disposed tonnage. In particular, organics (30.7 percent of overall MSW) and paper (25.4 percent of overall MSW) represent the largest recoverable fractions, followed by plastics (18.9 percent, combining rigid and film). Together, these categories define the core opportunity set for statewide diversion planning.

- **Organics management (largest opportunity):** With wasted food (edible) alone at 15.1 percent of disposed MSW (plus additional inedible food and other organics), strategies that combine food waste prevention, edible food recovery, and organics processing capacity (composting and/or anaerobic digestion) are likely to produce the largest system-wide disposal reductions.

- **Paper and cardboard recovery:** Corrugated cardboard (7.2 percent overall; 10.6 percent in the commercial stream) supports targeted commercial recycling approaches (e.g., service requirements or incentives for high-generating businesses) alongside continued residential recycling system improvements.

- **Compostable paper alignment:** Compostable paper represents 6.4 percent of disposed MSW and often requires alignment between organics programs and processing facility acceptance policies (e.g., food-soiled paper inclusion criteria).

- **Plastics strategy split (rigid vs. film):** Plastics represent a substantial share of disposed MSW and typically require separate solutions for rigid containers versus film plastics, which are commonly excluded from curbside programs.

- **Textiles and reuse pathways:** Textiles and shoes represent 5.2 percent of disposed MSW, indicating potential value in reuse, repair, take-back, and targeted collection approaches that divert durable goods prior to disposal.

ACKNOWLEDGEMENTS

The SCS project team would like to thank the staff at the Tennessee Department of Environment and Conservation for their assistance in selecting and communicating with host facilities for the Tennessee Statewide Waste Characterization Study. SCS would also like to thank each host facility and their management and operations staff for their participation in and support of this project. This study would not have been possible without selected facilities graciously hosting field activities.

2 BACKGROUND

The State of Tennessee commissioned a statewide waste characterization study to answer a straightforward but foundational question: *what is actually being thrown away in Tennessee, where is it coming from, and what opportunities exist to recover value before materials are disposed?* Solid waste policy, infrastructure investment, and public education campaigns are most effective when they are grounded in current, reliable, state-specific data. Without an updated measurement of what materials are generated, disposed, and managed in Tennessee, it is difficult to set realistic diversion goals, prioritize materials, or measure progress over time.

The Tennessee Department of Environment and Conservation (TDEC) utilized funding provided through the Solid Waste Infrastructure for Recycling (SWIFR) Grant Program to complete this study. TDEC contracted with SCS Engineers to design and complete the study. TDEC pursued the study to strengthen statewide planning in an environment of rising disposal costs, evolving recycling markets, and increasing public expectations for sustainable materials management. Communities and regional planning entities face practical questions about how to extend landfill life, reduce long-term liabilities, and manage materials that can create operational challenges (such as food waste, film plastics, or lithium batteries). A waste characterization study provides the evidence needed to decide whether solutions should focus on preventing waste at the source, expanding recycling access, developing organics processing capacity, improving contamination reduction, or targeting specific commercial or institutional generators. In other words, the study converts “we should recycle more” into a clear picture of *which* materials, *from where*, and *through what programs* will deliver the greatest impact.

Another key driver for commissioning the study was TDEC’s interest in returning recoverable materials to productive use and supporting a more circular economy. Composition data helps quantify how much potentially recyclable paper, cardboard, metals, plastics, and glass are still entering the waste stream, as well as how much organics are being buried rather than composted or otherwise managed. This information is valuable not only for public agencies, but also for private companies evaluating new or expanded material recovery, composting, reuse, or manufacturing facilities that depend on predictable feedstock. By documenting what is available in the waste stream - and at what scale across Tennessee’s regions - the study helps reduce uncertainty for investments that can create jobs, improve environmental outcomes, and keep dollars circulating within the state.

TDEC also commissioned the study to ensure that public resources—particularly funding made available through the SWIFR Grant Program - could be directed strategically and evaluated transparently. Waste characterization results provide a defensible basis for identifying infrastructure gaps, designing grant criteria, and selecting projects that align with demonstrated needs (for

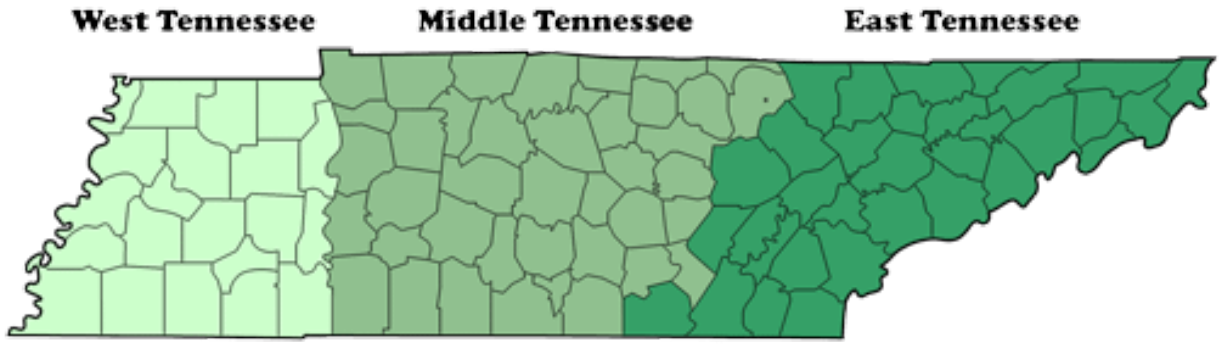
example, organics processing where food waste is a large fraction of disposed materials, or recycling system upgrades where contamination is undermining recovery). Just as importantly, a statewide baseline creates a reference point for future studies, allowing Tennessee to track how the waste stream changes as new programs are implemented, new products enter the market, and residents and businesses respond to outreach and service expansions.

Finally, Tennessee commissioned the statewide waste characterization study to update data from previous studies. The 2025 study's broader geographic coverage across Tennessee's grand divisions, multiple permitted facilities, and multiple material streams was designed to produce more representative, decision-grade data. Collectively, these motivations reflect a practical intent: to give TDEC, local governments, and industry partners a shared, data driven understanding of Tennessee's waste stream so they can prioritize actions, invest wisely, and measure progress toward reducing disposal and increasing material recovery.

3 METHODS

To establish the statewide waste profile, field events occurred at 10 solid waste facilities located throughout the State of Tennessee. To acquire representative data, the study was designed to visit solid waste facilities located in each of the Tennessee grand divisions. **Exhibit 1** depicts the grand divisions of Tennessee.

Exhibit 1. Tennessee Grand Divisions



Approximately 50 samples of municipal solid waste (MSW) or source-separated recyclable materials were collected during each field event that typically lasted for one week. Samples were collected from randomly selected trucks that delivered MSW or recyclables to a disposal site.

MANUAL CHARACTERIZATION

A manual characterization method was used to characterize MSW materials at landfills and recyclable materials at MRFs across Tennessee. This section describes the methods used to perform the manual characterization of these materials.

Sampling Plan

Prior to beginning fieldwork, the SCS team prepared a sampling plan based on the specific waste quantity data and distribution across material generating sectors specific to each facility hosting waste characterization field events. The sampling plans were used to guide sampling and sorting activities at each facility. These plans specified the targeted number of residential and commercial samples to obtain and sort based on the proportion of MSW received from each of these generating sectors. The sampling plans specified that up to 50 MSW or recycling samples were to be characterized at each facility based on a five-day work week.

Sample Selection and Screening

The SCS team screened incoming loads of materials at the scale house or at another designated location to select loads for sorting that align with each facility's sampling plan. The screening included a brief interview with the truck driver to confirm waste source and location, and generating sector of the materials on the truck.

Drivers with loads selected for sampling were directed to a designated area to discharge their load. At most facilities, SCS field personnel relied on the support of a facility-provided heavy equipment

operator to obtain the sample and deliver it to the sorting location. SCS staff recorded details of the sample electronically on a sample data form that was unique to each sample. Information recorded included material generating sector, hauler name, and truck number.

Sample Acquisition

Following material screening and selection, a random material sample was obtained directly by SCS staff or with the assistance of a facility heavy equipment operator. Material samples were placed in pre-weighed 35-to 45-gallon containers and subsequently weighed until at least 200 pounds of materials were obtained. Material samples were staged near the sorting location to manage and track each sample.

Material Categories and Types

Municipal Solid Waste

In partnership with TDEC staff, MSW material samples analyzed were grouped into 10 major material categories and 47 material types. Individual members of the SCS sort team were assigned select material categories and sorted waste into the designated material types. **Table 1** lists the material categories and types measured as part of this study. Examples of materials corresponding to each type are also provided.

Table 1. Municipal Solid Waste Material Categories and Types

Material Category	Material Type		Definitions/Examples
Paper	Sorted Office Paper		Bleached paper; white high-grade paper
	Newspaper and Magazines		Daily/weekly/monthly newspapers
	Mixed Paper		Construction paper, manila folders, junk mail, etc.
	Compostable Paper		Napkins, tissues, and paper towels
	Old Corrugated Cardboard		Shipping/pizza boxes
	Paperboard		Boxboard, chipboard; brown or white inside color; beer/soda cases, cereal boxes
	Other Paper (non-recyclable)		Composite paper; waxed cardboard; other paper not fitting another paper category
Plastic	Rigid	PET #1	Rigid containers with #1; water, soda bottles and containers
		HDPE #2	Rigid containers with #2; milk cartons, jars/tubs, cups, bottles, natural or pigmented
		PVC #3	Rigid containers with #3; food/drink
		LDPE #4	Rigid containers with #4; squeeze bottles
		PP #5	Rigid containers with #5; food containers/cups, auto parts, industrial fibers

Material Category	Material Type		Definitions/Examples
Plastic		PS #6	Rigid containers with #6; utensils, cups/lids, video cassettes, clamshells, expanded PS
		Durable Plastics	Laundry baskets, toys, buckets, PVC, flooring, etc.
		#7 and Other Plastic	Straws, cutlery, lids, etc.
	Film	Garbage Bags	Trash can liners, bags used to hold MSW
		Retail Bags	Grocery bags, shopping bags, etc.
		Other Film Plastic	Chip bags, storage bags, produce bags, plastic wrap
Organics	Wasted Food (edible)		Food waste that could have been eaten or donated
	Wasted Food (inedible)		Peels, eggshells, coffee grounds, FOG, etc.
	Yard Waste		Leaves, branches, grass clippings, garden waste, agricultural waste
	Wood (Non-C&D)		Treated or untreated wood, packaging, wooden utensils, other non-C&D wood
	Textiles and Shoes		Clothing, rags, sheets, towels, shoes, pillows, bags, belts, shoes
	Other Organics		Food processing wastes, cat litter, animal by-product
Metals	Steel and Tin Cans		Food and beverage cans
	Aluminum Cans		Soda/beer/sparking water cans, cat food, paint/varnish cans, aerosol cans
	Aerosol Cans		Metal spray cans for painting, body spray, whipped cream
	Other Ferrous Metal		Cast iron and iron
	Other Non-Ferrous Metal		Aluminum foil/trays/pans, copper, titanium, lead, zinc, brass/bronze
Glass	Clear Glass		Clear food/beverage bottles and jars
	Green Glass		Green food/beverage bottles and jars
	Amber Glass		Amber food/beverage bottles and jars
	Blue Glass		Blue food/beverage bottles and jars
	Other Glass		Lightbulbs, Pyrex, sheet glass; crushed, mixed glass
C&D Material	Drywall		Clean or painted drywall sheets
	Wood		Untreated/treated lumber, plywood, engineered wood
	Carpet		Textiles with backing, padding
	Other C&D Waste		Sinks, toilets, furniture, rubble, brick, masonry, ceramic
HHW	Batteries		All household batteries and lead-acid batteries
	Oil		Motor oil, lubricants
	Paint		Water and oil-based paints
	Anti-freeze		Coolants
	Other HHW		Pesticides, herbicides, poisons, oil filters, fluorescent lamps

Material Category	Material Type	Definitions/Examples
Electronics	Electronics	Toaster, microwave, electric toothbrush, toys, cellphone, keyboards, etc.
Other	Tires	Car tires, bicycle tires, and other tires
	Other	Other material not classified above; diapers
	Fines	Other materials too small to sort (i.e. <2 inches)

Recyclable Materials

In partnership with TDEC staff, recyclable material samples analyzed were grouped into six major material categories and 37 material types. Individual members of the SCS sort team were assigned select material categories and sorted waste into the designated material types. Table 2 lists the material categories and types measured as part of this study. Examples of materials corresponding to each type are also provided.

Table 2. Material Recyclability Categories and Types

Major Material Category	Material Type	Definitions/Examples
Paper	Mixed Paper	Construction paper, manila folders, junk mail, newspaper, office paper, paper board etc.
	Old Corrugated Cardboard	Shipping/pizza boxes
	Non-Recyclable Paper	Composite paper; waxed cardboard; napkins; paper towels; other non-recyclable paper
Plastic	PET #1	Rigid containers with #1; water, soda bottles, cups, and containers
	HDPE #2 - Natural	Natural rigid containers with #2; milk jugs, jars/tubs, cups, bottles
	HDPE #2 - Colored	Colored rigid containers with #2; milk jugs, jars/tubs, cups, bottles
	PVC #3	Rigid containers with #3; food/drink
	LDPE #4	Rigid containers with #4; squeeze bottles
	PP #5	Rigid containers with #5; food containers/cups, auto parts, industrial fibers
	PS #6 - Expanded	Expanded polystyrene, Styrofoam; cups, takeout containers
	PS #6 - Rigid	Rigid containers with #6; utensils, cups/lids, video cassettes
	Durable Plastics	Laundry baskets, toys, buckets, PVC, flooring, etc.
	#7 and Other Plastic	Straws, cutlery, lids, and other unidentifiable plastics
	Film Plastics	Shopping bags, garbage bags, produce bags, etc.

Major Material Category	Material Type	Definitions/Examples
Organic	Wasted Food	Food waste/scraps; banana peel, eggshell, vegetables, bread, etc.
	Yard Waste	Leaves, branches, grass clippings, garden waste, agricultural waste
	Textiles and Shoes	Clothing, rags, sheets, towels, shoes, pillows, bags, belts, shoes
Metals	Steel and Tin Cans	Food and beverage cans
	Aluminum Cans	Soda/beer/sparking water cans, cat food, paint/varnish cans, aerosol cans
Metals	Aerosol Cans	Metal spray cans for paint, body spray, whipped cream, etc.
	Other Ferrous Metal	Cast iron and iron
	Other Non-Ferrous Metal	Aluminum foil/trays/pans, copper, titanium, lead, zinc, brass/bronze
Glass	Clear Glass	Clear food/beverage bottles and jars
	Green Glass	Green food/beverage bottles and jars
	Amber Glass	Amber food/beverage bottles and jars
	Blue Glass	Blue food/beverage bottles and jars
	Other Glass	Lightbulbs, Pyrex, sheet glass; crushed, mixed glass
Other	Bagged Recycling	Bagged recyclable materials
	Bagged MSW	Bagged waste materials
	Tanglers	Hoses, extension cords, Christmas lights
	Electronics	Toaster, microwave, electric toothbrush, toys, cellphone, keyboards, etc.
	C&D Waste	Lumber, drywall, insulation, asphalt shingles, carpet, flooring, etc.
	HHW	Oil, antifreeze, sharps, paint, batteries, etc.
	Lithium Batteries	Lithium-ion batteries and devices containing them
	Tires	Car tires, bicycle tires, and other tires
	Other	Other material not classified above; diapers
	Fines	Other materials too small to sort (i.e. <2 inches)

Sample Sorting

The sorting of MSW and recyclable material samples was led by an experienced SCS professional with the support of a six-person sort crew. Fundamental to this task was a consistent, methodical, statistically valid sorting program that was repeated for each sample. SCS staff oversaw the entire sorting process and actively conducted quality control measures to confirm materials were sorted and weighed properly. Each member of the sort crew was assigned select material categories

for sorting (i.e., paper, plastic, metal, etc.). This improved the efficiency and accuracy of the sorting process as staff specialized in sorting the materials to which they were assigned.

The basic procedures and objectives for sorting were identical for each sample as described in the systematic approach below:

1. The sort crew transferred the refuse sample onto the sorting table until it was full and began characterizing the materials. Large or heavy waste items, such as bags of yard waste, were torn open, examined, and then placed directly into the appropriate waste container for subsequent weighing.

2. Crew members manually segregated each item of waste, according to material categories defined in **Table 1** for MSW (or **Table 2** for recyclables) and placed it in the appropriate container. These steps were repeated until the entire sample was sorted down to a particle size of 2-inches or less[1]. Small items, 2-inches or less, were swept off the sorting table into a separate container for weighing. These small items comprised the material category "Fines."

3. Containers of the sorted materials were individually weighed by SCS staff. SCS staff also performed quality control measures to confirm the purity of each sorted material category.

4. At the completion of sorting, the waste containers were moved to the scale where a representative of SCS weighed each category and recorded the net weight on the Sort Data Sheet. Tare weights of the empty containers were also recorded. Measurements were made to the nearest tenth of a pound.

This four-step process was repeated until all the day's samples taken at the site were characterized. Waste samples were maintained in as-disposed condition or as close to this as possible until the actual sorting began. Proper site layout and close supervision of sampling was maintained to avoid the need to repeatedly handle sampled wastes.

Consistent with good practice in such sampling programs, efforts were made to minimize sampling bias or other impacts on the integrity of the database. To this end, field sampling was coordinated to avoid holidays and other disruptions.

Data Collection

Following the sorting of material samples into different types listed above, each container was weighed on a portable bench scale, and the gross weight of the sorted material and container was recorded. The tare weight of each container was recorded directly on the container. The tare weight of the container was also recorded upon weighing the material. Material samples were maintained as collected to facilitate sample tracking. Proper site layout and close supervision of sampling avoided the need to handle samples multiple times.

[1] Note for samples of recyclable materials that bags, boxes, and other containers were not opened; the bag or box and the contents were placed directly into either the bagged MSW or bagged recycling category after inspection.

VISUAL CHARACTERIZATION

A visual characterization method was used to characterize construction/demolition/bulky (CDB) waste materials at landfills across Tennessee. This section describes the methods used to perform the visual characterization of these materials.

Sample Selection and Screening

CDB waste was visually characterized by experienced SCS field personnel. Staff would screen trucks at or near the working face of a landfill to confirm the contained waste aligned with the requirements for this study. Screening included interviewing the drivers to confirm the waste was generated in the State of Tennessee and, when possible, the specific location or type of property where the waste was collected. When possible, the SCS staff recorded the total weight of each load as reported on the corresponding scale ticket as provided by the driver.

If the load of CDB waste met the criteria for characterization as part of this project, the SCS team would record the information about the materials on a sample data form that was unique to each sample. The truck driver was then directed to dump the entire load in a designated area (often on the side of the landfill working face) for safe access by field personnel. The truck driver was asked to create a long spread-out pile of the materials to facilitate inspection and identification of as many materials as possible in each load.

Sample Characterization

SCS field personnel would independently walk around the pile of waste materials and note the major components present in the waste load. Staff would then complete a second, third, and fourth observation of the waste load to note materials present in smaller quantities.

Throughout the visual inspection of the waste materials field personnel would estimate the percentage volume of each material component and record it on the sample data form. Staff reviewed the data to confirm that the sum of the percentages equals 100 percent. Upon conclusion of the data recording and field quality check of the data, SCS staff took pictures of each load and then directed landfill operations staff to push the load for disposal and another load was selected.

Material Categories

The CDB material samples were visually characterized into seven major material categories and 24 specific material types. **Table 3** includes a listing of the CDB waste material categories and types with corresponding definitions and examples of each material type.

Table 3. Construction/Demolition/Bulky Waste Material Categories and Types

Material Category	Material Type	Definition/Examples
Paper	Old Corrugated Cardboard	Shipping/pizza boxes
Organics	Yard Waste	Leaves, branches, grass clippings, garden waste
	Textiles and Shoes	Clothing, sofas, bags, curtains

Material Category	Material Type	Definition/Examples
	Other Organics	Food processing wastes, animal by-product
Metals	Ferrous Metals	Iron, steel, stainless steel, etc.
	Non-Ferrous Metals	Aluminum, copper, lead, zinc, brass
	White Goods	Refrigerator, stove, washing machine, dryer
Glass	Glass	Windows, mirrors, glass bottles
Construction and Demolition Debris	Bricks, Rubble, Masonry, Concrete, etc.	Bricks, rubble, masonry, concrete, etc.
	Drywall	Clean or painted drywall sheets
	Untreated Wood	Lumber, plywood, wood with no paint, stain, chemical additives
	Treated Wood	Wood items with paint, stain and other chemical coatings/treatments
	Carpets	Textiles with backing, padding
	Asphalt Shingles	Roofing shingles
	Insulation	Fiberglass insulation
	Other C&D Waste	Sinks, toilets, porcelain, tile, insulation
Electronics	Electronics	Toaster, microwave, electric toothbrush, toys, cellphone, keyboards, etc.
Other	Mattresses	Mattresses and box springs
	Tires	Car tires, bicycle tires, and other tires
	Furniture	Primarily wood; upholstered; desks, chairs, sofas, etc.
	Durable Rigid Plastics	Buckets, playhouse, swing set, etc.
	Bagged MSW	Unknown bagged materials
	Dirt, Sand, Soil	Soil, dirt, fully composted materials
	Other Material	Other material not classified; note material type on data form

HEALTH AND SAFETY

Appendix A includes a sample health and safety plan developed for the project.

4 RESULTS

MUNICIPAL SOLID WASTE

The municipal solid waste (MSW) stream analysis includes material profiles overall for the State of Tennessee and individual profiles for the residential and commercial sectors by grand division.

Overall Statewide MSW Composition

A total of 390 MSW samples were characterized as part of the field activities from April 2025 to March 2026 and including MSW generated through both residential and commercial activities. The composition includes the mean percent by material category and type, standard deviation, and 95 percent confidence intervals based on the number of samples and variability between the samples.

Exhibit 2 presents a visual representation of the major material categories. Organics and Paper represent 56.1 percent of the overall waste stream. Table 4 presents the overall waste composition by material type based on the 390 MSW samples collected and sorted during the study. The five most common material types, by weight, of the overall State of Tennessee waste stream were:

- Wasted Food – Edible (15.1 percent),
- Other (7.4 percent)
- Old Corrugated Cardboard (7.2 percent)
- Compostable Paper (6.4 percent)
- Textiles and Shoes (5.2 percent)

Exhibit 2. Statewide Overall MSW Composition Summary

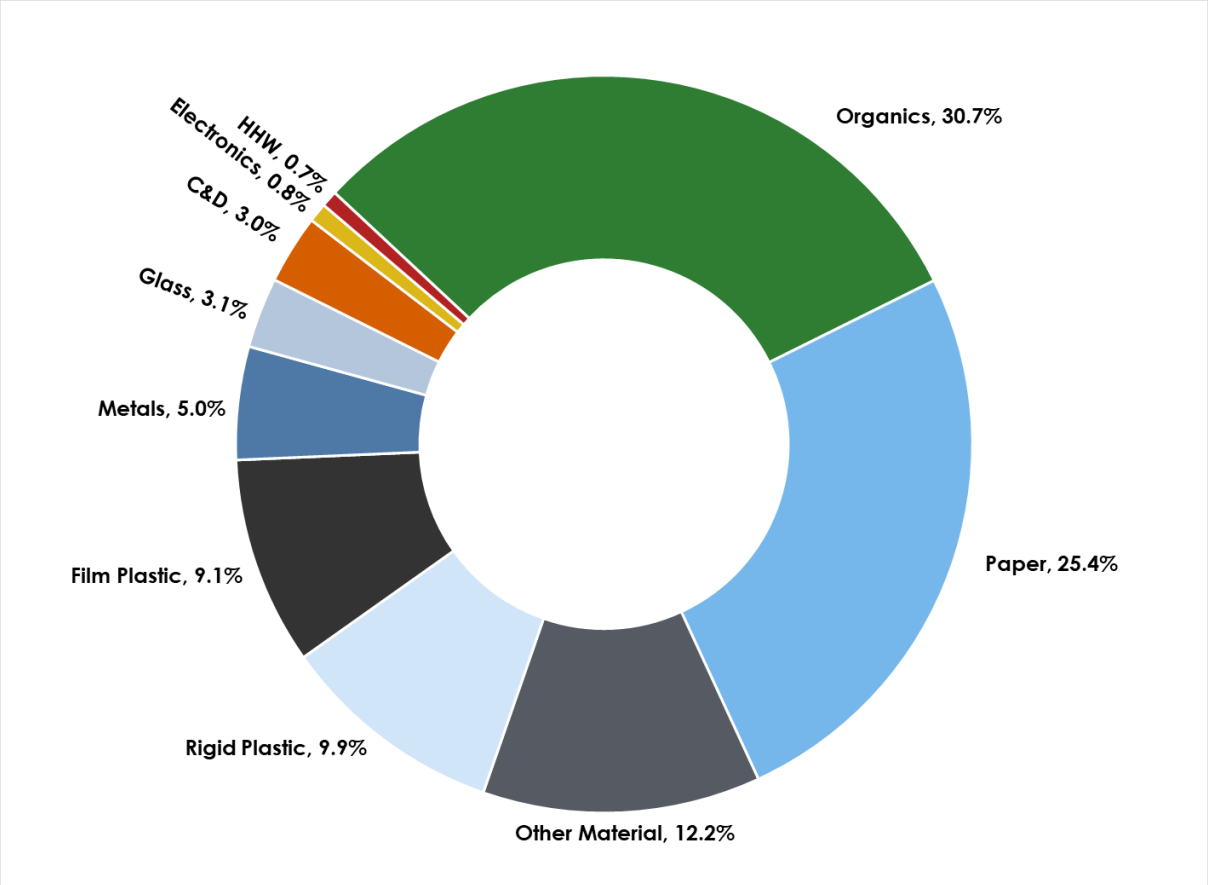


Table 4. Statewide Overall MSW Composition Detailed

Material Components	Mean Composition	Standard Deviation	95% Confidence Limits Lower	Upper
PAPER				
Sorted Office Paper	2.0%	1.9%	1.9%	2.2%
Newspaper and Magazines	0.8%	1.1%	0.7%	0.9%
Mixed Paper	2.3%	2.1%	2.1%	2.5%
Compostable Paper	6.4%	2.8%	6.2%	6.7%
Old Corrugated Cardboard	7.2%	7.1%	6.5%	7.9%
Paperboard	4.4%	2.0%	4.2%	4.6%
Other Paper (non-recyclable)	2.3%	4.7%	1.8%	2.8%
Total Paper	**25.4%**			
RIGID PLASTIC				
PET #1	2.9%	1.3%	2.7%	3.0%
HDPE #2	1.2%	0.7%	1.1%	1.3%
PVC #3	<0.1%	0.2%	<0.1%	<0.1%
LDPE #4	<0.1%	<0.1%	<0.1%	<0.1%
PP #5	1.4%	0.8%	1.4%	1.5%
PS #6	1.4%	1.0%	1.3%	1.5%
Durable Plastics	1.9%	2.3%	1.7%	2.1%
#7 and Other Rigid Plastics	1.0%	0.7%	1.0%	1.1%
Total Rigid Plastic	**9.9%**			
FILM PLASTIC				
Garbage Bags	3.3%	1.7%	3.1%	3.4%
Retail Bags	1.3%	0.7%	1.3%	1.4%
Other Film Plastics	4.5%	3.0%	4.2%	4.8%
Total Film Plastic	**9.1%**			
ORGANICS				
Wasted Food (edible)	15.1%	8.5%	14.3%	16.0%
Wasted Food (inedible)	4.7%	4.5%	4.3%	5.1%
Yard Waste	2.2%	6.3%	1.6%	2.8%
Wood (Non-C&D)	0.4%	1.3%	0.2%	0.5%
Textiles and Shoes	5.2%	7.9%	4.4%	6.0%
Other Organics	3.2%	5.9%	2.6%	3.8%
Total Organics	**30.7%**			

Table 4. Overall MSW Composition Detailed (cont.)

Material Components	Mean Composition	Standard Deviation	95% Confidence Limits Lower	Upper
METALS				
Steel and Tin Cans	1.2%	1.0%	1.1%	1.3%
Aluminum Cans	1.3%	0.7%	1.2%	1.4%
Aerosol Cans	0.2%	0.3%	0.2%	0.2%
Other Ferrous Metal	1.4%	2.8%	1.1%	1.7%
Other Non-Ferrous Metal	0.8%	1.2%	0.7%	0.9%
Total Metals	**5.0%**			
GLASS				
Clear Glass	1.8%	1.6%	1.7%	2.0%
Green Glass	0.4%	0.7%	0.3%	0.5%
Amber Glass	0.6%	1.1%	0.4%	0.7%
Blue Glass	<0.1%	0.2%	<0.1%	<0.1%
Other Glass	0.3%	1.0%	0.2%	0.4%
Total Glass	**3.1%**			
C&D MATERIAL				
Drywall	0.3%	3.0%	<0.1%	0.6%
Wood	1.2%	3.2%	0.9%	1.5%
Carpet	0.6%	2.4%	0.3%	0.8%
Other C&D Waste	0.9%	3.5%	0.6%	1.3%
Total C&D Material	**3.0%**			
HOUSEHOLD HAZARDOUS WASTE				
Batteries	0.1%	0.7%	<0.1%	0.2%
Oil	<0.1%	0.5%	<0.1%	<0.1%
Paint	0.1%	0.8%	<0.1%	0.2%
Anti-freeze	<0.1%	0.2%	<0.1%	<0.1%
Other HHW	0.4%	2.2%	0.2%	0.7%
Total HHW	**0.7%**			
ELECTRONICS				
Electronics	0.8%	2.0%	0.6%	1.0%
Total Electronics	**0.8%**			
OTHER				
Tires	0.4%	3.4%	<0.1%	0.7%
Other	7.4%	6.7%	6.7%	8.0%
Fines	4.4%	3.6%	4.1%	4.8%
Total Other	**12.2%**			
TOTAL	**100.0%**			

Note: Composition based on 390 samples.

Residential MSW Composition

Residential waste is generated through day-to-day household activities, including food preparation and consumption, cleaning, personal care, home maintenance, and the ongoing purchase and use of packaged consumer goods. Collection is most commonly provided through curbside routes operated by municipal departments or contracted haulers, with rear-load collection vehicles or automated side-load collection vehicles.

Exhibit 3 presents a visual representation of the major material categories**.** Organics and Paper represent 55.0 percent of the overall waste stream. **Table 5** presents the statewide residential waste composition by material type based on the 217 residential MSW samples collected and sorted during the study. The five most common material types, by weight, of the statewide residential waste stream were:

- Wasted Food - Edible (14.5 percent)
- Other (8.8 percent)
- Compostable Paper (6.6 percent)
- Paperboard (5.3 percent)
- Fines (5.1 percent)

Exhibit 3. Statewide Residential MSW Composition Summary

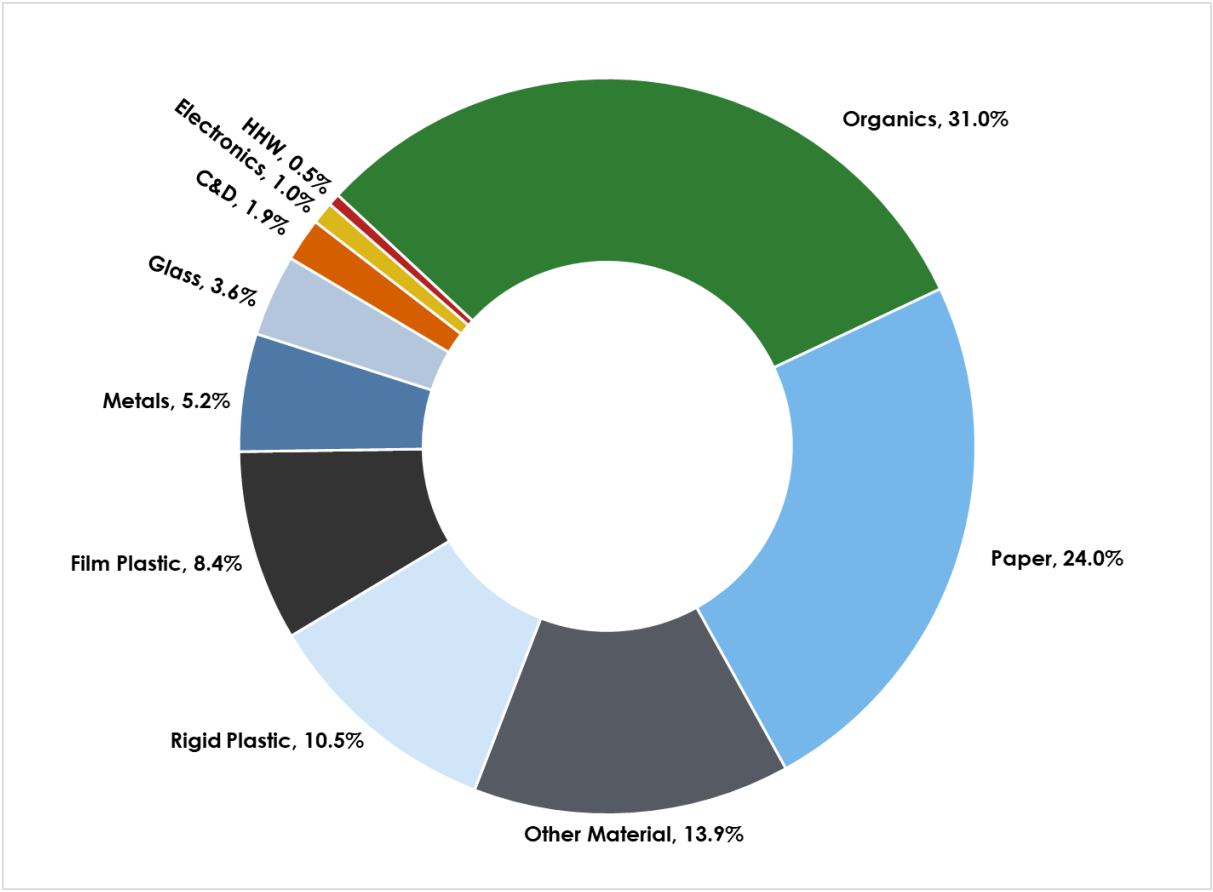


Table 5. Statewide Residential MSW Composition Detailed

Material Components	Mean Composition	Standard Deviation	95% Confidence Limits Lower	Upper
PAPER				
Sorted Office Paper	2.3%	1.8%	2.1%	2.6%
Newspaper and Magazines	1.0%	1.0%	0.9%	1.1%
Mixed Paper	2.1%	1.3%	1.9%	2.2%
Compostable Paper	6.6%	2.3%	6.3%	6.9%
Old Corrugated Cardboard	4.6%	2.6%	4.2%	4.9%
Paperboard	5.3%	1.6%	5.1%	5.5%
Other Paper (non-recyclable)	2.1%	1.4%	1.9%	2.3%
Total Paper	**24.0%**			
RIGID PLASTIC				
PET #1	3.4%	1.0%	3.3%	3.5%
HDPE #2	1.3%	0.6%	1.2%	1.4%
PVC #3	<0.1%	<0.1%	<0.1%	<0.1%
LDPE #4	<0.1%	<0.1%	<0.1%	<0.1%
PP #5	1.5%	0.7%	1.4%	1.6%
PS #6	1.4%	0.6%	1.3%	1.4%
Durable Plastics	1.9%	1.8%	1.6%	2.1%
#7 and Other Rigid Plastics	1.1%	0.5%	1.0%	1.1%
Total Rigid Plastic	**10.5%**			
FILM PLASTIC				
Garbage Bags	2.8%	0.9%	2.7%	3.0%
Retail Bags	1.6%	0.6%	1.5%	1.7%
Other Film Plastics	3.9%	1.2%	3.8%	4.1%
Total Film Plastic	**8.4%**			
ORGANICS				
Wasted Food (Edible)	14.5%	6.2%	13.7%	15.4%
Wasted Food (Inedible)	4.5%	2.7%	4.2%	4.9%
Yard Waste	2.7%	6.1%	1.9%	3.5%
Wood (Non-C&D)	0.3%	0.7%	0.2%	0.4%
Textiles and Shoes	5.0%	3.7%	4.5%	5.5%
Other Organics	4.0%	5.4%	3.3%	4.7%
Total Organics	**31.0%**			

Table 5. Statewide Residential MSW Composition Detailed (cont.)

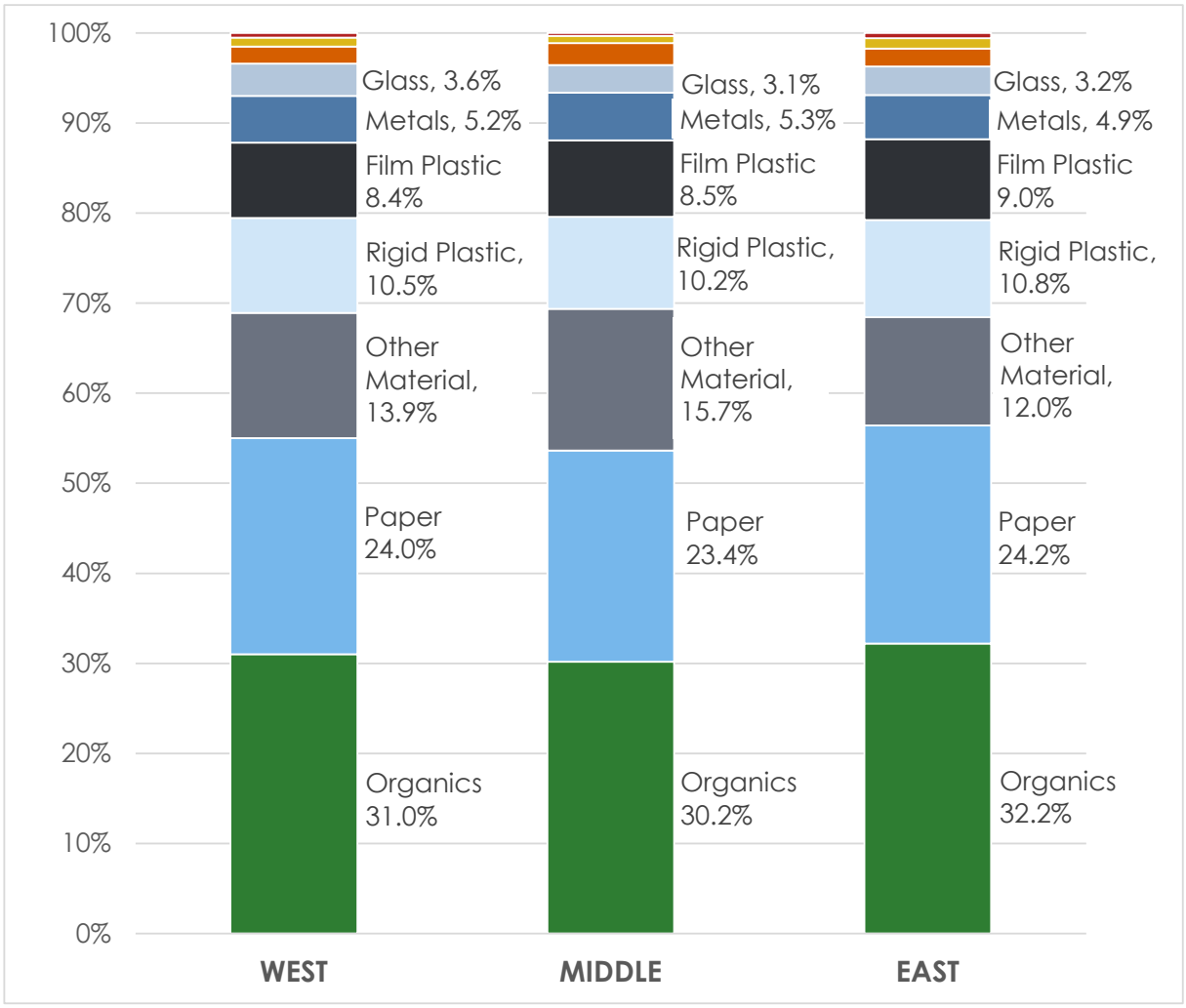
Material Components	Mean Composition	Standard Deviation	95% Confidence Limits Lower	95% Confidence Limits Upper
METALS				
Steel and Tin Cans	1.4%	0.7%	1.3%	1.5%
Aluminum Cans	1.6%	0.6%	1.5%	1.6%
Aerosol Cans	0.2%	0.2%	0.2%	0.3%
Other Ferrous Metal	1.1%	1.8%	0.9%	1.3%
Other Non-Ferrous Metal	0.8%	1.0%	0.7%	1.0%
Total Metals	**5.2%**			
GLASS				
Clear Glass	2.2%	1.6%	2.0%	2.4%
Green Glass	0.5%	0.8%	0.4%	0.6%
Amber Glass	0.5%	0.6%	0.5%	0.6%
Blue Glass	<0.1%	0.3%	<0.1%	<0.1%
Other Glass	0.3%	0.9%	0.2%	0.4%
Total Glass	**3.6%**			
C&D MATERIAL				
Drywall	0.2%	1.7%	<0.1%	0.4%
Wood	0.6%	1.3%	0.4%	0.8%
Carpet	0.4%	1.7%	0.2%	0.7%
Other C&D Waste	0.6%	2.9%	0.2%	1.0%
Total C&D Material	**1.9%**			
HOUSEHOLD HAZARDOUS WASTE				
Batteries	0.2%	0.9%	<0.1%	0.3%
Oil	<0.1%	0.1%	<0.1%	<0.1%
Paint	<0.1%	0.5%	<0.1%	0.2%
Anit-freeze	<0.1%	<0.1%	<0.1%	<0.1%
Other HHW	0.2%	0.8%	0.1%	0.4%
Total HHW	**0.5%**			
ELECTRONICS				
Electronics	1.0%	2.3%	0.7%	1.3%
Total Electronics	**1.0%**			
OTHER MATERIAL				
Tires	<0.1%	0.1%	<0.1%	<0.1%
Other	8.8%	6.4%	7.9%	9.6%
Fines	5.1%	3.9%	4.6%	5.6%
Total Other Material	**13.9%**			
TOTALS	**100.0%**			

Note: Composition based on 217 samples.

Residential MSW Composition by Grand Division

Exhibit 4 presents the residential MSW composition across the three Tennessee grand divisions and indicates that overall variation by major material category is minimal.

Exhibit 4. Residential MSW Composition by Grand Division



While the overall category-level composition is similar across the grand divisions, there is sample-to-sample variation within each region that can cause individual material types to appear higher or lower when comparing one composition to another. However, when the 95 percent confidence intervals are compared across grand divisions, certain materials show statistically significant differences in composition. These statistically significant differences are presented in **Table 6**.

Table 6. Significant Differences in Residential MSW Composition By Grand Division

Major Material Category	Material Type	High	Low
Paper	Mixed Paper	East 2.6%	West 1.6%
	Paperboard	West 5.7%	Middle 4.9%
Rigid Plastic	Polypropylene #5	Middle & East 1.7% each	West 1.2%
	Polystyrene #6	West 1.4%	East 1.2%
	#7 and Other Rigid Plastics	East 1.3%	West & Middle 1.0% & 0.9%
Film Plastic	Garbage Bags	West 3.1%	East 2.5%
	Retail Bags	West 1.8%	East 1.4%
	Other Film Plastic	Middle 4.4%	West & East 3.7% & 3.8%
Organics	Wasted Food (Inedible)	East 6.7%	West & Middle
	Yard Waste	West & Middle 3.2% & 3.5%	East 0.8%
Metals	Steel and Tin Cans	East 1.7%	Middle 1.2%
Glass	Green Glass	East 0.8%	West & Middle 0.3% & 0.4%
HHW	Paint	East 0.2%	West & Middle <0.1% each
Other Material	Other	West 10.0%	Middle 6.8%

Detailed composition summaries for residential waste by Tennessee grand division are included in **Appendix B.**

Commercial MSW Composition

Commercial waste is generated by businesses and institutions through routine operations such as retail sales, office work, warehousing and distribution, hospitality and food service, healthcare, and facility maintenance. Common sources include packaging from incoming shipments, corrugated cardboard and paper from administrative activities, food waste from kitchens and breakrooms, and a wide range of disposable service items and supplies.

Exhibit 5 presents a visual representation of the major material categories**.** Organics and Paper represent 57.7 percent of the overall waste stream. **Table 7** presents the statewide residential waste composition by material type based on the 173 commercial MSW samples collected and sorted during the study. The five most common material types, by weight, of the statewide commercial waste stream were:

- Waste Food - Edible (15.9 percent)
- Old Corrugated Cardboard (10.6 percent)
- Compostable Paper (6.2 percent)
- Other (5.6 percent)
- Textiles and Shoes (5.4 percent)

Exhibit 5. Statewide Commercial MSW Composition Summary

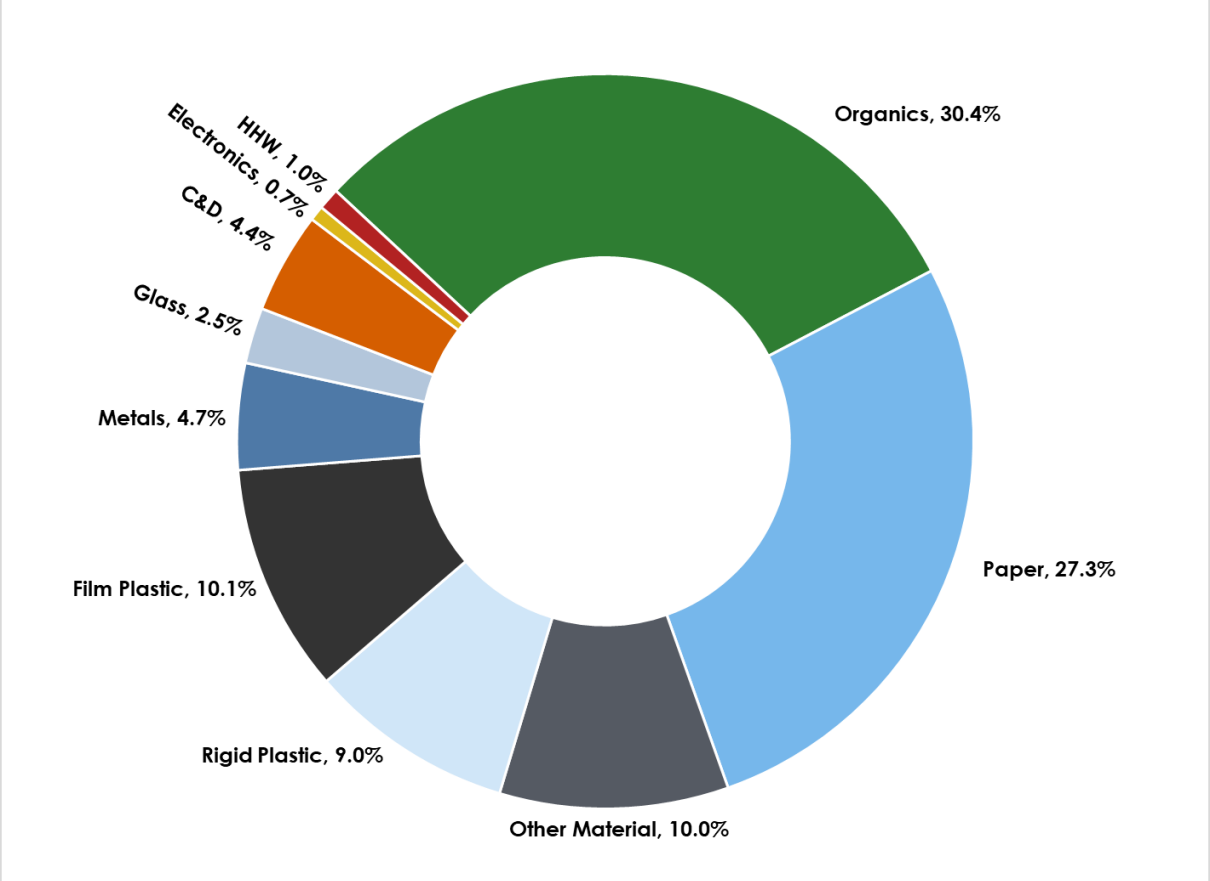


Table 7. Statewide Commercial MSW Composition Detailed

Material Components	Mean Composition	Standard Deviation	95% Confidence Limits Lower	Upper
PAPER				
Sorted Office Paper	1.7%	2.0%	1.4%	2.0%
Newspaper and Magazines	0.6%	1.1%	0.4%	0.7%
Mixed Paper	2.5%	2.8%	2.1%	2.9%
Compostable Paper	6.2%	3.4%	5.7%	6.7%
Old Corrugated Cardboard	10.6%	9.3%	9.2%	12.0%
Paperboard	3.1%	1.8%	2.9%	3.4%
Other Paper (non-recyclable)	2.5%	6.9%	1.5%	3.6%
Total Paper	**27.3%**			
RIGID PLASTIC				
PET #1	2.2%	1.3%	2.0%	2.4%
HDPE #2	1.1%	0.9%	0.9%	1.2%
PVC #3	<0.1%	0.3%	<0.1%	<0.1%
LDPE #4	<0.1%	0.1%	<0.1%	<0.1%
PP #5	1.3%	0.9%	1.2%	1.5%
PS #6	1.4%	1.4%	1.2%	1.7%
Durable Plastics	1.9%	2.8%	1.5%	2.4%
#7 and Other Rigid Plastics	1.0%	0.8%	0.8%	1.1%
Total Rigid Plastic	**9.0%**			
FILM PLASTIC				
Garbage Bags	3.8%	2.2%	3.5%	4.2%
Retail Bags	1.0%	0.6%	0.9%	1.1%
Other Film Plastics	5.3%	4.2%	4.6%	5.9%
Total Film Plastic	**10.1%**			
ORGANICS				
Wasted Food (Edible)	15.9%	10.7%	14.3%	17.5%
Wasted Food (Inedible)	4.9%	6.0%	4.1%	5.8%
Yard Waste	1.5%	6.5%	0.5%	2.5%
Wood (Non-C&D)	0.5%	1.7%	0.2%	0.7%
Textiles and Shoes	5.4%	11.1%	3.8%	7.1%
Other Organics	2.1%	6.4%	1.2%	3.1%
Total Organics	**30.4%**			

Table 7. Statewide Commercial MSW Composition Detailed (Cont.)

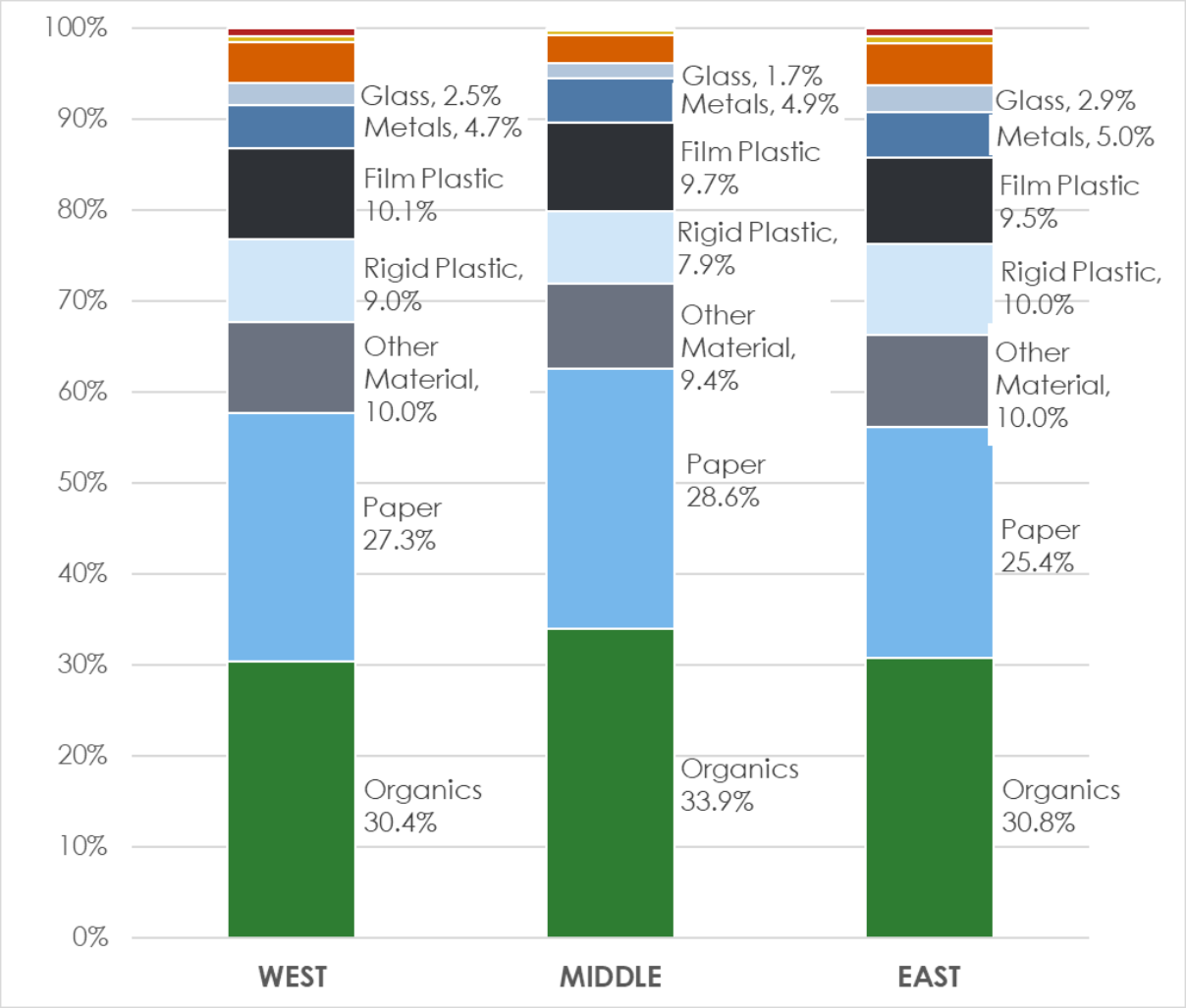
Material Components	Mean Composition	Standard Deviation	95% Confidence Limits Lower	Upper
METALS				
Steel and Tin Cans	0.9%	1.2%	0.8%	1.1%
Aluminum Cans	1.0%	0.7%	0.9%	1.1%
Aerosol Cans	0.2%	0.3%	0.1%	0.2%
Other Ferrous Metal	1.8%	3.6%	1.2%	2.3%
Other Non-Ferrous Metal	0.8%	1.3%	0.6%	1.0%
Total Metals	**4.7%**			
GLASS				
Clear Glass	1.4%	1.5%	1.1%	1.6%
Green Glass	0.2%	0.6%	0.2%	0.3%
Amber Glass	0.6%	1.5%	0.4%	0.8%
Blue Glass	<0.1%	<0.1%	<0.1%	<0.1%
Other Glass	0.3%	1.1%	0.1%	0.4%
Total Glass	**2.5%**			
C&D MATERIAL				
Drywall	0.4%	4.0%	<0.1%	1.0%
Wood	1.9%	4.4%	1.3%	2.6%
Carpet	0.7%	3.0%	0.3%	1.2%
Other C&D Waste	1.3%	4.1%	0.7%	2.0%
Total C&D Material	**4.4%**			
HOUSEHOLD HAZARDOUS WASTE				
Batteries	<0.1%	<0.1%	<0.1%	<0.1%
Oil	<0.1%	0.8%	<0.1%	0.2%
Paint	0.1%	1.0%	<0.1%	0.3%
Anit-freeze	<0.1%	0.3%	<0.1%	<0.1%
Other HHW	0.7%	3.2%	0.2%	1.1%
Total HHW	**1.0%**			
ELECTRONICS				
Electronics	0.7%	1.6%	0.4%	0.9%
Total Electronics	**0.7%**			
OTHER MATERIAL				
Tires	0.8%	5.1%	<0.1%	1.6%
Other	5.6%	6.7%	4.6%	6.6%
Fines	3.6%	2.9%	3.2%	4.0%
Total Other Material	**10.0%**			
TOTALS	**100.0%**			

Note: Composition based on 173 samples.

Commercial MSW Composition by Grand Division

Exhibit 6 presents the commercial MSW composition across the three Tennessee grand divisions and indicates that overall variation by major material category is minimal.

Exhibit 6. Commercial MSW Composition by Grand Division



While the overall category-level composition is similar across the grand divisions, there is sample-to-sample variation within each region that can cause individual material types to appear higher or lower when comparing one composition to another. However, when the 95 percent confidence intervals are compared across grand divisions, certain materials show statistically significant differences in composition. These statistically significant differences are presented in **Table 8**.

Table 8. Significant Differences in Commercial MSW Composition By Grand Division

Major Material Category	Material Type	High	Low
Paper	Sorted Office Paper	West & East 1.7% & 2.1%	Middle 0.9%
	Mixed Paper	East 3.2%	Middle 1.8%
	Old Corrugated Cardboard	West 12.9%	East 7.7%
Rigid Plastic	PET #1	East 2.7%	West 1.9%
	Durable Plastic	Middle 3.6%	West & East 1.4% & 1.5%
Film Plastic	Garbage Bags	West & East 4.1% & 4.2%	Middle 2.9%
Glass	Clear Glass	Middle & East 1.9% & 1.5%	West 0.8%
	Green Glass	East 0.5%	West <0.1%

Detailed composition summaries for commercial waste by Tennessee grand division are included in **Appendix C.**

RECYCLABLE MATERIALS

This section details the recycling stream composition measured from material recovery facilities in the State of Tennessee. The recycling stream targeted for this study included recyclable materials that were separated from the municipal solid waste stream at the point of generation (i.e. residential or commercial property). These materials were collected from the generator either curbside or onsite by a commercial or municipal hauler and delivered to a recycling center for consolidation and/or processing. These materials were characterized upon or shortly after delivery to the recycling centers before any processing or handling of the materials occurred.

This section presents the compilation of the 72 recyclable material samples collected and characterized as part of this study. A unique aspect of this study is the variation in the recycling processing systems in which the samples were obtained. Two types of systems were represented by the samples obtained and characterized:

- Single-Stream – All recyclable materials are collected mixed together in the same container.

- Multi-Stream – Each unique recyclable material is collected separately in a bin or container. Material types are not mixed during collection or processing.

The breakdown of samples by facility type is as follows:

- 48 single-stream samples
- 24 multi-stream samples
  72 TOTAL

The material types measured for the single-stream recycling samples were grouped as either "recyclable materials" or "contamination." Classification of each material type is based on the professional experience of SCS Engineers staff, input from TDEC staff, and research on typical materials accepted for recycling at material recovery facilities.

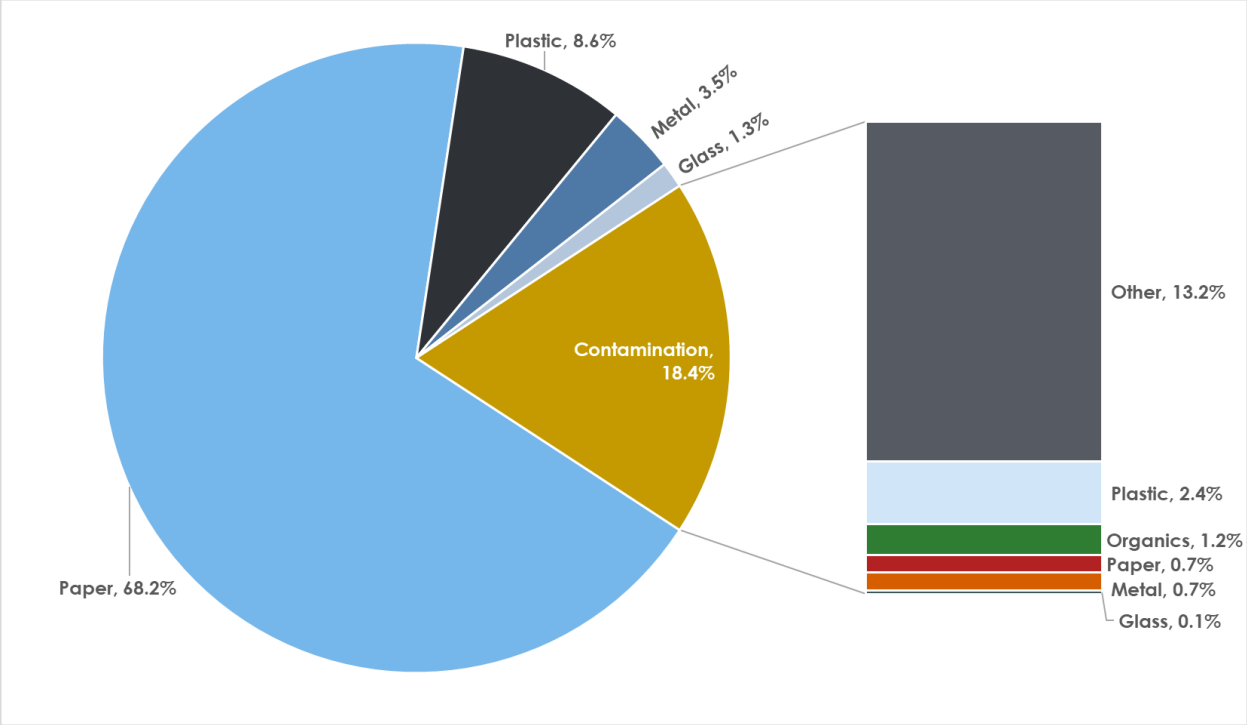
For the recycling samples characterized as part of the multi-stream collection program, only materials accepted for recycling as part of that stream are considered accepted recyclable materials. All other materials, even materials that can be recycled but were placed in the wrong stream, were considered contamination.

Single-Stream

This section presents the results of the single-stream recycling composition field measurements. The composition includes 95 percent confidence intervals based on the number of samples and variability between the samples. A total of 48 single-stream samples were characterized as part of this study.

Exhibit 7 presents a visual representation of the major material categories in single-stream recycling, including contamination. Table 9 presents the single-stream recycling composition by material type based on the 48 samples collected and sorted during the study.

Exhibit 7. Single-Stream Recycling Composition Summary



For national context, contamination in single-stream curbside recycling programs in the United States is widely recognized as a significant operational challenge. The Recycling Partnership's *2020 State of Curbside Recycling Report* identifies the national average contamination rate to be approximately 17 percent by weight, based on extensive data collection and analysis across diverse curbside programs. This estimate has since become a commonly referenced benchmark within the recycling industry, reflecting the scale of non-recyclable materials entering the recycling stream and the resulting impacts on processing efficiency, program costs, and material quality. Although individual community rates vary depending on program design, public education, and local infrastructure, The Recycling Partnership's 17 percent figure remains the most frequently cited national indicator of contamination levels.

Table 9. Single-Stream Recycling Composition Detailed

Material Components	Mean Composition	Standard Deviation	95% Confidence Limits Lower	Upper
RECYCLABLE MATERIALS				
PAPER				
Corrugated Cardboard	45.6%	18.9%	41.1%	50.0%
Mixed Paper	22.6%	12.3%	19.7%	25.5%
Total Paper	**68.2%**			
PLASTIC				
PET #1	5.1%	2.5%	4.5%	5.7%
HDPE #2 - Natural	0.8%	0.5%	0.7%	0.9%
HDPE #2 - Colored	1.5%	0.8%	1.3%	1.7%
PVC #3	<0.1%	<0.1%	<0.1%	<0.1%
LDPE #4	<0.1%	<0.1%	<0.1%	<0.1%
PP #5	0.7%	0.5%	0.6%	0.8%
PS #6 - Rigid	<0.1%	0.2%	<0.1%	0.1%
#7 and Other Plastic	0.4%	0.3%	0.3%	0.5%
Total Plastic	**8.6%**			
METAL				
Aluminum Cans	2.4%	1.4%	2.1%	2.7%
Steel and Tin Cans	1.1%	1.3%	0.8%	1.4%
Total Metal	**3.5%**			
GLASS				
Clear Glass	0.9%	1.1%	0.7%	1.2%
Green Glass	0.2%	0.4%	<0.1%	0.3%
Amber Glass	0.2%	0.5%	<0.1%	0.3%
Blue Glass	<0.1%	<0.1%	<0.1%	<0.1%
Total Glass	**1.33%**			
TOTAL RECYCLABLE MATERIALS	**81.6%**			

Table 9. Single-Stream Recycling Composition Detailed (cont.)

Material Components	Mean Composition	Standard Deviation	95% Confidence Limits Lower	Upper
CONTAMINATION				
PAPER				
Non-recyclable Paper	0.7%	1.5%	0.3%	1.0%
Total Paper	**0.7%**			
PLASTIC				
PS #6 - Expanded	0.2%	0.3%	0.1%	0.3%
Durable Plastics	1.1%	1.8%	0.7%	1.6%
Film Plastic	1.1%	1.1%	0.8%	1.4%
Total Plastic	**2.4%**			
ORGANICS				
Food Waste	0.5%	0.9%	0.3%	0.7%
Yard Waste	<0.1%	0.1%	<0.1%	<0.1%
Textiles and Shoes	0.7%	1.4%	0.3%	1.0%
Total Organics	**1.2%**			
METALS				
Aersol Cans	<0.1%	0.1%	<0.1%	<0.1%
Other Ferrous Metals	0.3%	0.7%	0.2%	0.5%
Other Non-Ferrous Metals	0.3%	0.9%	<0.1%	0.5%
Total Other Metals	**0.7%**			
GLASS				
Other Glass	0.1%	0.7%	<0.1%	0.3%
Total Glass	**0.1%**			
OTHER				
Bagged Recycling	3.1%	8.4%	1.1%	5.1%
Bagged MSW	5.9%	10.3%	3.4%	8.3%
Tanglers	0.1%	1.0%	<0.1%	0.4%
Electronics	0.2%	0.8%	<0.1%	0.4%
C&D Waste	0.5%	1.0%	0.3%	0.7%
HHW	0.3%	1.5%	<0.1%	0.7%
Lithium Batteries	<0.1%	<0.1%	<0.1%	<0.1%
Tires	<0.1%	<0.1%	<0.1%	<0.1%
Other	0.5%	1.0%	0.3%	0.8%
Fines	2.5%	2.6%	1.9%	3.1%
Total Other	**13.2%**			
CONTAMINATION SUBTOTAL	**18.4%**			
TOTAL	**100.0%**			

Note: Composition based on 48 samples.

Multi-Stream

This section presents the results of the multi-stream recycling composition field measurements. The composition includes 95 percent confidence intervals based on the number of samples and variability between the samples. A total of 24 multi-stream samples were characterized that represent four different material types: cardboard, mixed paper, plastic, and aluminum. The sample breakdown by material type is as follows:

- 15 cardboard samples
- 4 mixed paper samples
- 3 plastic samples
- 2 aluminum samples
  24 TOTAL

Contamination measurements varied across all four material streams. The cardboard stream was found to have the lowest contamination levels at five percent by weight. The aluminum can stream was measured to have the highest level of contamination at about 28 percent. This is primarily due to aluminum cans being contained in plastic bags (bagged cans were considered contamination) and steel/tin cans being mixed with aluminum.

Exhibits 8-11 present a summary composition of each of the four material streams and corresponding contamination rates. **Tables 10-13** include a detailed summary of each stream by material type.

Exhibit 8. Cardboard Material Stream Composition Summary

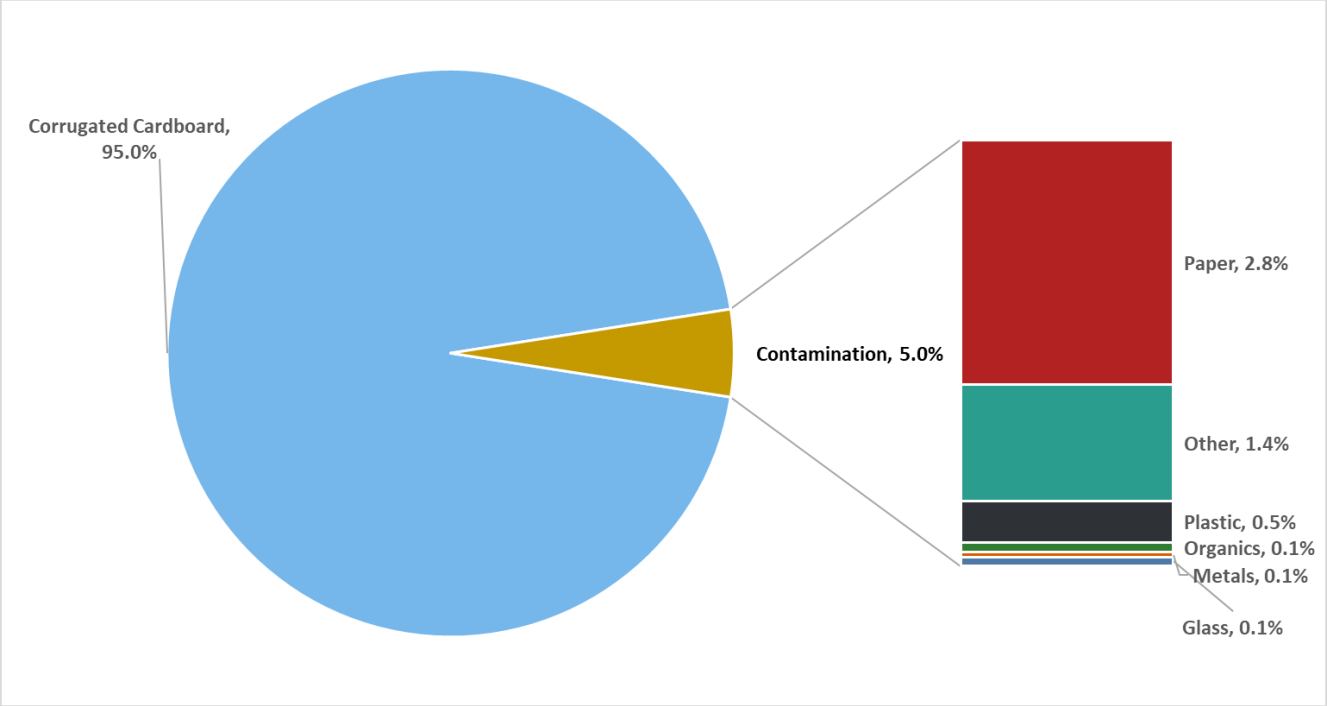


Table 10. Cardboard Material Stream Composition Detailed

Material Components	Mean Composition	Standard Deviation	95% Confidence Limits Lower	Upper
ACCEPTED RECYCLABLE MATERIALS				
Corrugated Cardboard	95.0%	4.9%	92.6%	97.5%
TOTAL RECYCLABLE MATERIALS	**95.0%**			
CONTAMINATION				
PAPER				
Mixed Paper	1.3%	1.2%	0.7%	1.9%
Non-recyclable Paper	1.5%	1.7%	0.7%	2.4%
Total Paper	**2.8%**			
PLASTIC				
PET #1	<0.1%	<0.1%	<0.1%	<0.1%
HDPE #2 - Natural	<0.1%	<0.1%	<0.1%	<0.1%
HDPE #2 - Colored	<0.1%	<0.1%	<0.1%	<0.1%
PVC #3	<0.1%	<0.1%	<0.1%	<0.1%
LDPE #4	<0.1%	<0.1%	<0.1%	<0.1%
PP #5	<0.1%	<0.1%	<0.1%	<0.1%
PS #6 - Expanded	0.2%	0.2%	<0.1%	0.3%
PS #6 - Rigid	<0.1%	<0.1%	<0.1%	<0.1%
Durable Plastics	<0.1%	<0.1%	<0.1%	<0.1%
#7 and Other Plastic	<0.1%	<0.1%	<0.1%	0.1%
Film Plastics	0.2%	0.1%	<0.1%	0.2%
Total Plastic	**0.5%**			
ORGANICS				
Wasted Food	<0.1%	<0.1%	<0.1%	0.1%
Yard Waste	<0.1%	<0.1%	<0.1%	<0.1%
Textiles and Shoes	<0.1%	<0.1%	<0.1%	<0.1%
Total Organics	**0.1%**			

Table 10. Cardboard Material Stream Composition Detailed (cont.)

Material Components	Mean Composition	Standard Deviation	95% Confidence Limits Lower	95% Confidence Limits Upper
CONTAMINATION				
METALS				
Steel and Tin Cans	<0.1%	<0.1%	<0.1%	<0.1%
Aluminum Cans	<0.1%	<0.1%	<0.1%	<0.1%
Aersol Cans	<0.1%	<0.1%	<0.1%	<0.1%
Other Ferrous Metals	<0.1%	0.2%	<0.1%	0.1%
Other Non-Ferrous Metals	<0.1%	<0.1%	<0.1%	<0.1%
Total Other Metals	**<0.1%**			
GLASS				
Clear Glass	<0.1%	<0.1%	<0.1%	<0.1%
Green Glass	<0.1%	0.2%	<0.1%	0.2%
Amber Glass	<0.1%	<0.1%	<0.1%	<0.1%
Blue Glass	<0.1%	<0.1%	<0.1%	<0.1%
Other Glass	<0.1%	<0.1%	<0.1%	<0.1%
Total Glass	**0.1%**			
OTHER				
Bagged Recycling	0.2%	0.5%	<0.1%	0.4%
Bagged MSW	0.2%	0.3%	<0.1%	0.3%
Tanglers	<0.1%	<0.1%	<0.1%	<0.1%
Electronics	0.5%	1.8%	<0.1%	1.4%
C&D Waste	0.4%	0.8%	<0.1%	0.8%
HHW	<0.1%	0.2%	<0.1%	0.2%
Lithium Batteries	<0.1%	<0.1%	<0.1%	<0.1%
Tires	<0.1%	<0.1%	<0.1%	<0.1%
Other	0.1%	0.2%	<0.1%	0.2%
Fines	<0.1%	<0.1%	<0.1%	<0.1%
Total Other	**1.4%**			
TOTAL CONTAMINATION	**5.0%**			
TOTAL	**100.0%**			

Note: Composition based on 15 samples.

Exhibit 9. Mixed Paper Material Stream Composition Summary

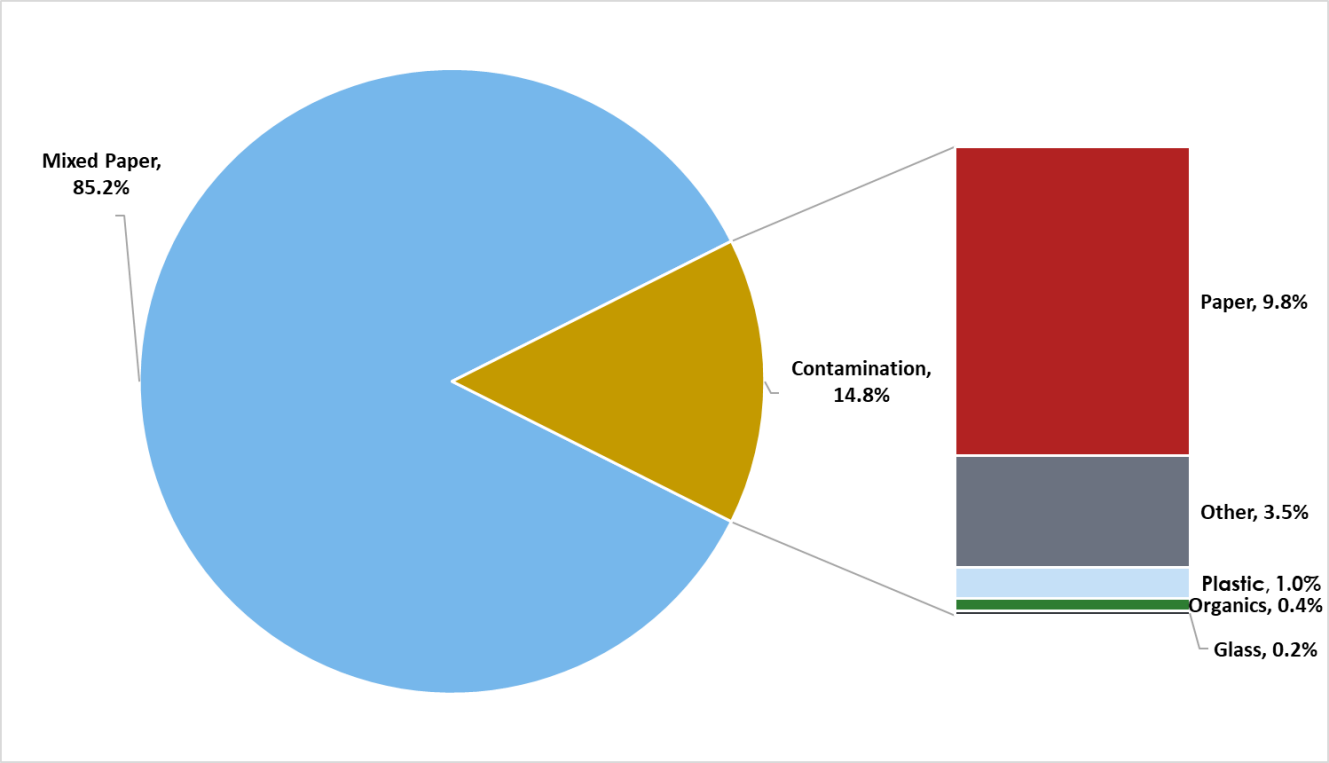


Table 11. Mixed Paper Material Stream Composition Detailed

Material Components	Mean Composition	Standard Deviation	95% Confidence Limits Lower	Upper
ACCEPTED RECYCLABLE MATERIALS				
Mixed Paper	85.2%	12.2%	73.2%	97.2%
TOTAL RECYCLABLE MATERIALS	**85.2%**			
CONTAMINATION				
PAPER				
Old Corrugated Cardboard	9.6%	12.3%	<0.1%	21.7%
Nonrecyclable Paper	0.2%	0.2%	<0.1%	0.4%
Total Paper	**9.8%**			
PLASTIC				
PET #1	<0.1%	<0.1%	<0.1%	0.1%
HDPE #2 - Natural	<0.1%	<0.1%	<0.1%	<0.1%
HDPE #2 - Colored	<0.1%	<0.1%	<0.1%	<0.1%
PVC #3	<0.1%	<0.1%	<0.1%	<0.1%
LDPE #4	<0.1%	<0.1%	<0.1%	<0.1%
PP #5	<0.1%	<0.1%	<0.1%	<0.1%
PS #6 - Expanded	0.4%	0.4%	<0.1%	0.8%
PS #6 - Rigid	<0.1%	<0.1%	<0.1%	<0.1%
Durable Plastics	0.2%	0.3%	<0.1%	0.5%
#7 and Other Plastic	<0.1%	<0.1%	<0.1%	<0.1%
Film Plastics	0.3%	0.2%	<0.1%	0.5%
Total Plastic	**1.0%**			
ORGANICS				
Wasted Food	0.2%	0.3%	<0.1%	0.5%
Yard Waste	<0.1%	<0.1%	<0.1%	<0.1%
Textiles and Shoes	0.1%	0.2%	<0.1%	0.3%
Total Organics	**0.4%**			

Table 11. Mixed Paper Material Stream Composition Detailed (cont.)

Material Components	Mean Composition	Standard Deviation	95% Confidence Limits Lower	Upper
CONTAMINATION				
METALS				
Steel and Tin Cans	<0.1%	<0.1%	<0.1%	<0.1%
Aluminum Cans	<0.1%	<0.1%	<0.1%	<0.1%
Aersol Cans	<0.1%	<0.1%	<0.1%	<0.1%
Other Ferrous Metals	<0.1%	<0.1%	<0.1%	<0.1%
Other Non-Ferrous Metals	<0.1%	<0.1%	<0.1%	<0.1%
Total Other Metals	**<0.1%**			
GLASS				
Clear Glass	<0.1%	0.1%	<0.1%	0.2%
Green Glass	<0.1%	<0.1%	<0.1%	<0.1%
Amber Glass	<0.1%	<0.1%	<0.1%	<0.1%
Blue Glass	<0.1%	<0.1%	<0.1%	<0.1%
Other Glass	<0.1%	0.2%	<0.1%	0.3%
Total Glass	**0.2%**			
OTHER				
Bagged Recycling	0.3%	0.7%	<0.1%	1.0%
Bagged MSW	3.0%	3.0%	<0.1%	5.9%
Tanglers	<0.1%	<0.1%	<0.1%	<0.1%
Electronics	<0.1%	<0.1%	<0.1%	<0.1%
C&D Waste	<0.1%	<0.1%	<0.1%	<0.1%
HHW	<0.1%	<0.1%	<0.1%	<0.1%
Lithium Batteries	<0.1%	<0.1%	<0.1%	<0.1%
Tires	<0.1%	<0.1%	<0.1%	<0.1%
Other	0.1%	<0.1%	<0.1%	0.2%
Fines	<0.1%	<0.1%	<0.1%	<0.1%
Total Other	**3.5%**			
TOTAL CONTAMINATION	**14.8%**			
TOTAL	**100.0%**			

Note: Composition based on 4 samples.

Exhibit 10. Plastic Material Stream Composition Summary

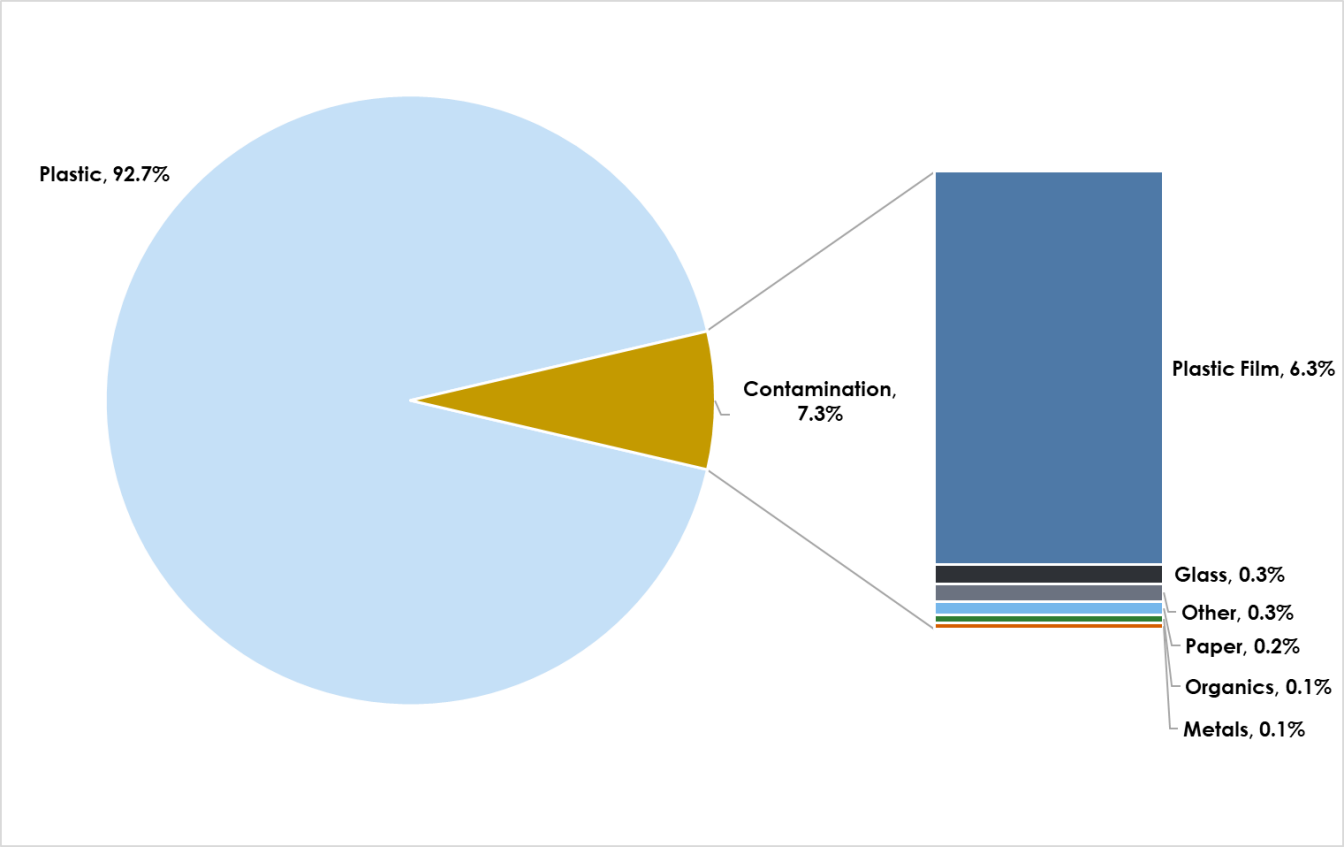


Table 12. Plastic Material Stream Composition Detailed

Material Components	Mean Composition	Standard Deviation	95% Confidence Limits Lower	Upper
ACCEPTED RECYCLABLE MATERIALS				
PET #1	57.8%	2.6%	54.8%	60.7%
HDPE #2 - Natural	9.1%	0.8%	8.2%	10.1%
HDPE #2 - Colored	12.1%	1.4%	10.5%	13.7%
PVC #3	<0.1%	<0.1%	<0.1%	<0.1%
LDPE #4	<0.1%	<0.1%	<0.1%	<0.1%
PP #5	8.4%	0.4%	7.9%	8.9%
PS #6 - Expanded	0.4%	<0.1%	0.3%	0.4%
PS #6 - Rigid	0.7%	<0.1%	0.7%	0.7%
Durable Plastics	1.8%	0.5%	1.3%	2.4%
#7 and Other Plastic	2.4%	0.6%	1.6%	3.1%
TOTAL RECYCLABLE MATERIALS	**92.7%**			
CONTAMINATION				
PAPER				
Mixed Paper	<0.1%	<0.1%	<0.1%	0.2%
Old Corrugated Cardboard	<0.1%	0.1%	<0.1%	0.2%
Nonrecyclable Paper	<0.1%	<0.1%	<0.1%	<0.1%
Total Paper	**0.2%**			
PLASTIC				
Film Plastics	6.3%	0.7%	5.4%	7.1%
Total Plastic	**6.3%**			
ORGANICS				
Wasted Food	0.1%	<0.1%	<0.1%	0.2%
Yard Waste	<0.1%	<0.1%	<0.1%	<0.1%
Textiles and Shoes	<0.1%	<0.1%	<0.1%	<0.1%
Total Organics	**0.1%**			

Table 12. Plastic Material Stream Composition Detailed (cont.)

Material Components	Mean Composition	Standard Deviation	95% Confidence Limits Lower	Upper
CONTAMINATION				
METALS				
Steel and Tin Cans	<0.1%	<0.1%	<0.1%	0.1%
Aluminum Cans	<0.1%	<0.1%	<0.1%	<0.1%
Aersol Cans	<0.1%	<0.1%	<0.1%	<0.1%
Other Ferrous Metals	<0.1%	<0.1%	<0.1%	<0.1%
Other Non-Ferrous Metals	<0.1%	<0.1%	<0.1%	<0.1%
Total Other Metals	**0.1%**			
GLASS				
Clear Glass	0.1%	<0.1%	<0.1%	0.2%
Green Glass	0.1%	0.1%	<0.1%	0.2%
Amber Glass	<0.1%	<0.1%	<0.1%	0.1%
Blue Glass	<0.1%	<0.1%	<0.1%	<0.1%
Other Glass	<0.1%	<0.1%	<0.1%	0.1%
Total Glass	**0.3%**			
OTHER				
Bagged Recycling	<0.1%	<0.1%	<0.1%	<0.1%
Bagged MSW	<0.1%	3.0%	<0.1%	3.5%
Tanglers	0.2%	<0.1%	0.1%	0.2%
Electronics	<0.1%	<0.1%	<0.1%	<0.1%
C&D Waste	<0.1%	<0.1%	<0.1%	<0.1%
HHW	<0.1%	<0.1%	<0.1%	<0.1%
Lithium Batteries	<0.1%	<0.1%	<0.1%	<0.1%
Tires	<0.1%	<0.1%	<0.1%	<0.1%
Other	<0.1%	<0.1%	<0.1%	0.1%
Fines	<0.1%	<0.1%	<0.1%	<0.1%
Total Other	**0.3%**			
TOTAL CONTAMINATION	**7.3%**			
TOTAL	**100.0%**			

Note: Composition based on 3 samples.

Exhibit 11. Aluminum Material Stream Composition Summary

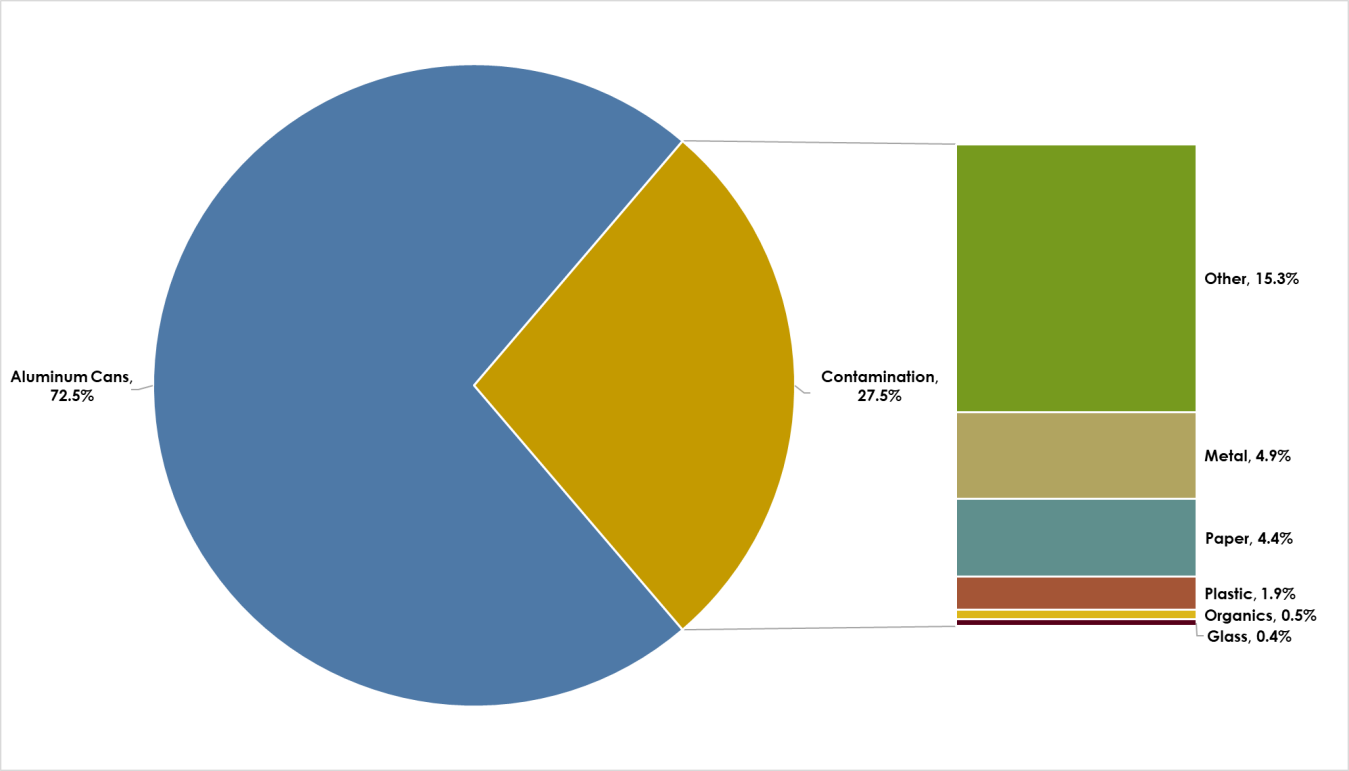


Table 13. Aluminum Material Stream Composition Detailed

Material Components	Mean Composition	Standard Deviation	95% Confidence Limits Lower	Upper
ACCEPTED RECYCLABLE MATERIALS				
Aluminum Cans	72.5%	8.8%	60.3%	84.7%
TOTAL RECYCLABLE MATERIALS	**72.5%**			
CONTAMINATION				
PAPER				
Mixed Paper	<0.1%	<0.1%	<0.1%	<0.1%
Old Corrugated Cardboard	4.4%	4.0%	<0.1%	10.0%
Nonrecyclable Paper	<0.1%	<0.1%	<0.1%	<0.1%
Total Paper	**4.4%**			
PLASTIC				
PET #1	0.3%	0.1%	0.1%	0.5%
HDPE #2 - Natural	<0.1%	<0.1%	<0.1%	<0.1%
HDPE #2 - Colored	<0.1%	<0.1%	<0.1%	0.1%
PVC #3	<0.1%	<0.1%	<0.1%	<0.1%
LDPE #4	<0.1%	<0.1%	<0.1%	<0.1%
PP #5	<0.1%	<0.1%	<0.1%	0.1%
PS #6 - Expanded	<0.1%	<0.1%	<0.1%	<0.1%
PS #6 - Rigid	<0.1%	<0.1%	<0.1%	<0.1%
Durable Plastics	0.3%	0.5%	<0.1%	1.0%
#7 and Other Plastic	<0.1%	<0.1%	<0.1%	<0.1%
Film Plastics	1.0%	0.3%	0.6%	1.4%
Total Plastic	**1.9%**			
ORGANICS				
Wasted Food	0.2%	0.2%	<0.1%	0.5%
Yard Waste	<0.1%	<0.1%	<0.1%	0.1%
Textiles and Shoes	0.2%	<0.1%	0.2%	0.3%
Total Organics	**0.5%**			

Table 13. Aluminum Material Stream Composition Detailed (cont.)

Material Components	Mean Composition	Standard Deviation	95% Confidence Limits Lower	Upper
CONTAMINATION				
METALS				
Steel and Tin Cans	4.5%	0.5%	3.9%	5.2%
Aersol Cans	<0.1%	<0.1%	<0.1%	<0.1%
Other Ferrous Metals	<0.1%	<0.1%	<0.1%	<0.1%
Other Non-Ferrous Metals	0.4%	0.4%	<0.1%	1.0%
Total Other Metals	**4.9%**			
GLASS				
Clear Glass	0.2%	<0.1%	0.1%	0.2%
Green Glass	<0.1%	<0.1%	<0.1%	<0.1%
Amber Glass	<0.1%	<0.1%	<0.1%	0.2%
Blue Glass	<0.1%	<0.1%	<0.1%	<0.1%
Other Glass	0.1%	0.2%	<0.1%	0.4%
Total Glass	**0.4%**			
OTHER				
Bagged Recycling	14.5%	2.3%	11.3%	17.7%
Bagged MSW	0.3%	0.4%	<0.1%	0.8%
Tanglers	<0.1%	<0.1%	<0.1%	<0.1%
Electronics	<0.1%	<0.1%	<0.1%	<0.1%
C&D Waste	<0.1%	<0.1%	<0.1%	0.1%
HHW	0.2%	0.3%	<0.1%	0.7%
Lithium Batteries	<0.1%	<0.1%	<0.1%	<0.1%
Tires	<0.1%	<0.1%	<0.1%	<0.1%
Other	0.1%	<0.1%	<0.1%	0.1%
Fines	<0.1%	<0.1%	<0.1%	0.1%
Total Other	**15.3%**			
TOTAL CONTAMINATION	**27.5%**			
TOTAL	**100.0%**			

Note: Composition based on 2 samples.

CONSTRUCTION/DEMOLITION/BULKY WASTE

This section presents the composition estimated for construction/demolition/bulky waste disposed in Tennessee. A total of 289 waste loads were visually inspected and characterized at solid waste facilities across the State of Tennessee. The estimated percent composition by volume for each material was recorded in the field. Additionally, for each sample visually characterized, information on the net weight and total estimated volume of the load was recorded. This field data was used in conjunction with volume-to-weight density conversion factors compiled by the U.S. EPA to estimate the weight of each material type visually identified.

Each material type weight was normalized to the net weight of the load as provided by scale house staff or truck drivers. Entire loads of construction/demolition/bulky waste were characterized as part of this study. Table 14 provides a summary of the number of construction/demolition/bulky waste loads by Tennessee grand division. Appendix D provides the U.S. EPA Volume-to-Weight Material Conversion Factors.

Table 14. Summary of Construction/Demolition/Bulky Waste Loads Characterized

Grand Division	Number of Waste Loads	Percent of Total
West	116	40%
Middle	112	39%
East	61	21%
Total	**289**	**100%**

Construction/demolition and bulky waste streams tend to be more variable than typical MSW because they are driven by discrete projects and episodic cleanouts rather than routine daily generation. Loads may be dominated by a single material (e.g., drywall from interior renovations, treated wood from decking, concrete from demolition, or furniture from tenant turnover), and the mix can shift with the local construction cycle, storm and seasonal cleanup activity, and differences in who is delivering material (contractors, self-haul residents, or commercial cleanout crews). As a result, individual load compositions can vary substantially from one another even within the same facility and time period, and statewide averages should be interpreted as indicative of overall trends rather than predictive of any single load or short-term period.

Overall

The overall State of Tennessee construction/demolition/bulky waste stream composition includes the average percentage of each material by weight for the 289 waste loads visually characterized as part of this study. Samples were visually characterized into the categories presented in **Table 3.** The most common materials estimated to comprise the construction/demolition/bulky waste stream, by weight, include:

- Dirt, Sand, and Soil (15.0 percent),
- Bricks, Rubble, Masonry, Concrete, etc. (14.2 percent), and
- Treated Wood (11.5 percent).

Exhibit 12 presents the summary of the construction/demolition/bulky waste stream composition and **Table 15** presents a detailed composition by material type.

Exhibit 12. Overall C&D Material Composition Summary

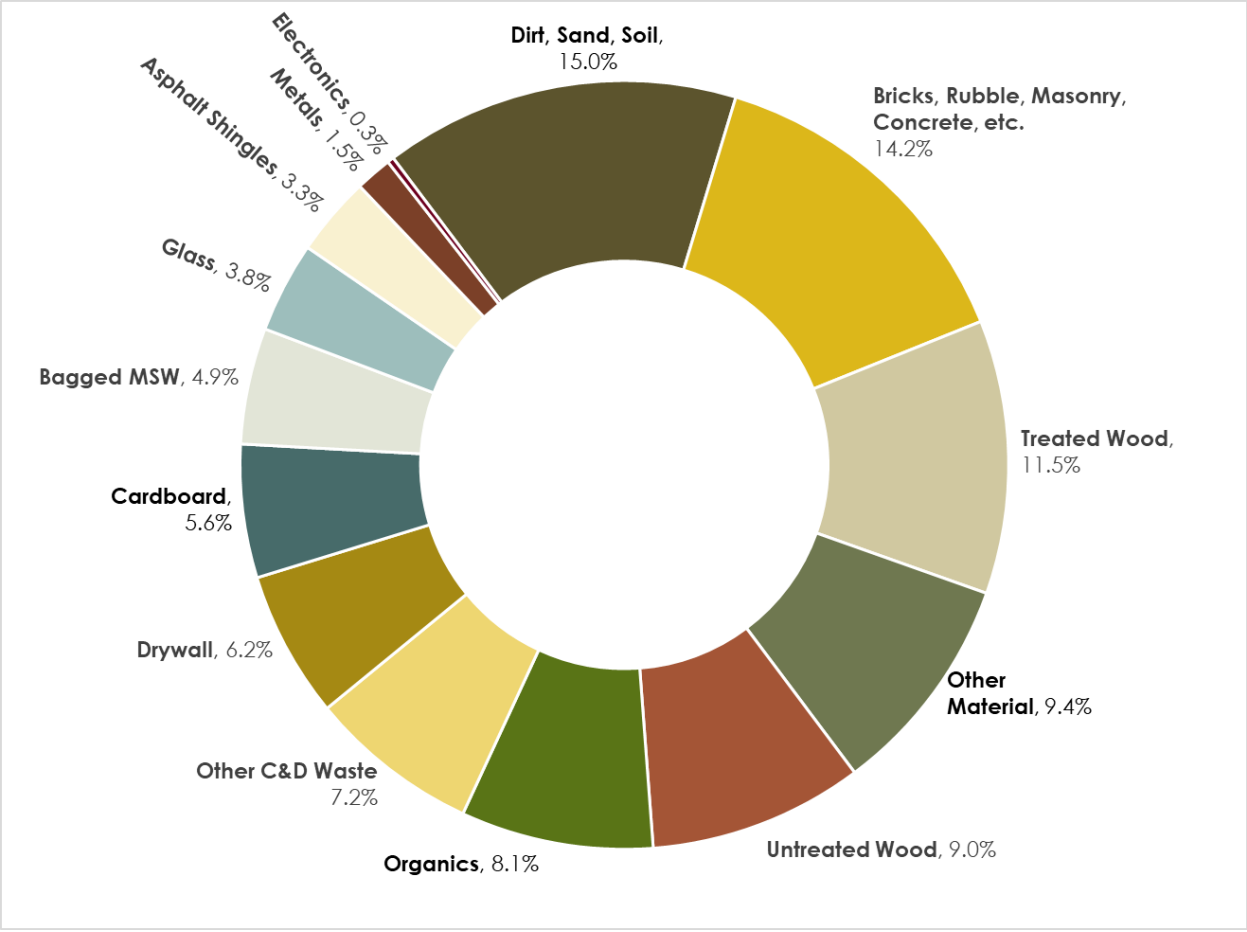


Table 15. Overall C&D Material Composition Detailed

Material Components	Mean Composition
PAPER	
Old Corrugated Cardboard	5.6%
Total Paper	**5.6%**
ORGANICS	
Yard Waste	7.6%
Textiles and Shoes	0.5%
Other Organics	<0.1%
Total Organics	**8.1%**
METALS	
Ferrous Metals	1.1%
Non-Ferrous Metals	0.4%
White Goods	<0.1%
Total Metals	**1.5%**
GLASS	
Glass	3.8%
Total Glass	**3.8%**
CONSTRUCTION AND DEMOLITION DEBRIS	
Bricks, Rubble, Masonry, Concrete, etc.	14.2%
Drywall	6.2%
Untreated Wood	9.0%
Treated Wood	11.5%
Carpets	1.0%
Asphalt Shingles	3.3%
Insulation	0.4%
Other C&D Waste	5.9%
Total Construction and Demolition Debris	**51.5%**
ELECTRONICS	
Electronics	0.3%
Total Electronics	**0.3%**
OTHER MATERIAL	
Mattresses	1.0%
Tires	<0.1%
Furniture	2.2%
Durable Rigid Plastics	2.1%
Bagged MSW	4.9%
Dirt, Sand, Soil	15.0%
Other Material	4.0%
Total Other Material	**29.2%**
TOTAL	**100.0%**

Note: Composition based on 289 samples.

West Division

The West Division construction/demolition/bulky waste stream composition includes the average percentage of each material by weight for the 116 material samples visually characterized as part of this study. The most common materials estimated to comprise the construction/demolition/bulky waste stream, by weight, include:

- Dirt, Sand, and Soil (24.0 percent),
- Untreated Wood (13.7 percent), and
- Other C&D Waste (13.4 percent).

Exhibit 13 presents the summary of the construction/demolition/bulky waste stream composition and **Table 16** presents a detailed composition by material type.

Exhibit 13. West Region C&D Material Composition Summary

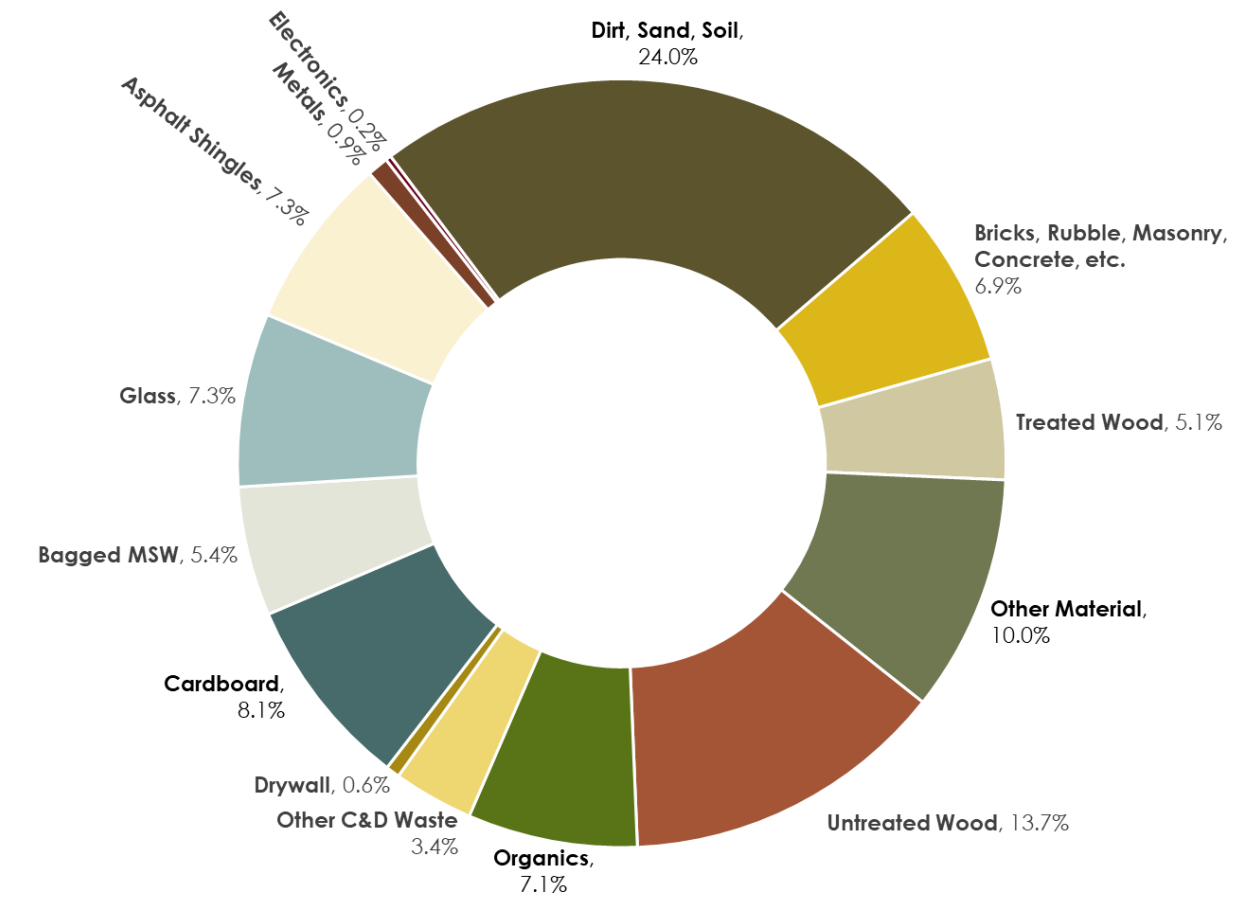


Table 16. West Region C&D Material Composition Detailed

Material Components	Mean Composition
PAPER	
Old Corrugated Cardboard	8.1%
Total Paper	**8.1%**
ORGANICS	
Yard Waste	6.5%
Textiles and Shoes	0.7%
Other Organics	<0.1%
Total Organics	**7.1%**
METALS	
Ferrous Metals	0.7%
Non-Ferrous Metals	0.2%
White Goods	<0.1%
Total Metals	**0.9%**
GLASS	
Glass	7.3%
Total Glass	**7.3%**
CONSTRUCTION AND DEMOLITION DEBRIS	
Bricks, Rubble, Masonry, Concrete, etc.	6.9%
Drywall	0.6%
Untreated Wood	13.7%
Treated Wood	5.1%
Carpets	0.5%
Asphalt Shingles	7.3%
Insulation	0.7%
Other C&D Waste	2.3%
Total Construction and Demolition Debris	**36.9%**
ELECTRONICS	
Electronics	0.2%
Total Electronics	**0.2%**
OTHER MATERIAL	
Mattresses	0.2%
Tires	<0.1%
Furniture	2.2%
Durable Rigid Plastics	1.8%
Bagged MSW	5.4%
Dirt, Sand, Soil	24.0%
Other Material	5.7%
Total Other Material	**39.4%**
TOTAL	**100.0%**

Note: Composition based on 116 samples.

Middle Tennessee

The Middle Division construction/demolition/bulky waste stream composition includes the average percentage of each material by weight for the 112 material samples visually characterized as part of this study. The most common materials estimated to comprise the construction/demolition/bulky waste stream, by weight, include:

- Other C&D Waste (20.3 percent),
- Brick, Rubble, Masonry, Concrete, etc. (18.6 percent),
- Organics (13.5 percent).

Exhibit 14 presents the summary of the construction/demolition/bulky waste stream composition and **Table 17** presents a detailed composition by material type.

Exhibit 14. Middle Region C&D Material Composition Summary

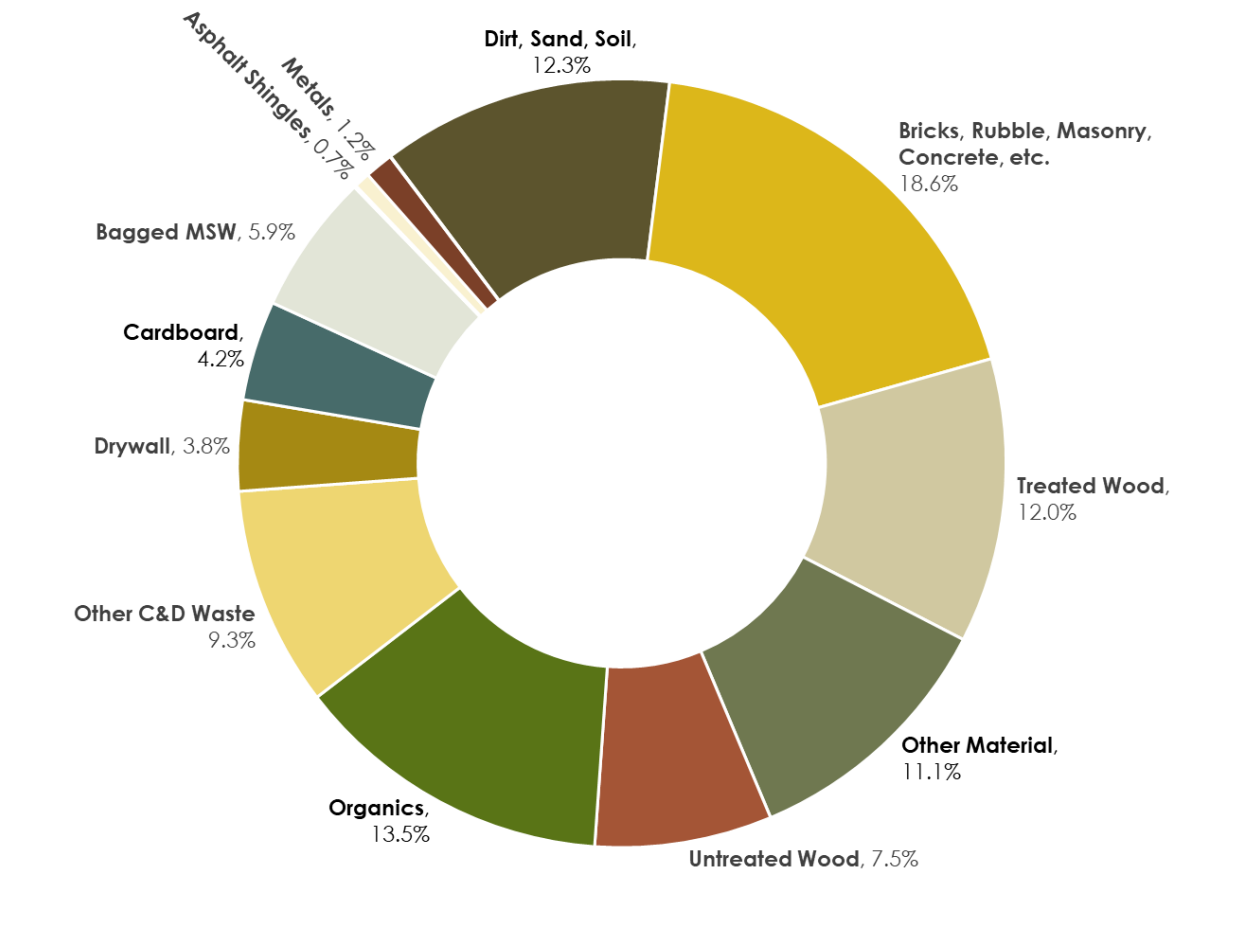


Table 17. Middle Region C&D Material Composition Detailed

Material Components	Mean Composition
PAPER	
Old Corrugated Cardboard	4.2%
Total Paper	**4.2%**
ORGANICS	
Yard Waste	12.9%
Textiles and Shoes	0.6%
Other Organics	<0.1%
Total Organics	13.5%
METALS	
Ferrous Metals	1.1%
Non-Ferrous Metals	<0.1%
White Goods	<0.1%
Total Metals	**1.2%**
GLASS	
Glass	<0.1%
Total Glass	**<0.1%**
CONSTRUCTION AND DEMOLITION DEBRIS	
Bricks, Rubble, Masonry, Concrete, etc.	18.6%
Drywall	3.8%
Untreated Wood	7.5%
Treated Wood	12.0%
Carpets	1.1%
Asphalt Shingles	0.7%
Insulation	0.1%
Other C&D Waste	8.1%
Total Construction and Demolition Debris	**51.8%**
ELECTRONICS	
Electronics	<0.1%
Total Electronics	**<0.1%**
OTHER MATERIAL	
Mattresses	2.4%
Tires	<0.1%
Furniture	3.6%
Durable Rigid Plastics	2.5%
Bagged MSW	5.9%
Dirt, Sand, Soil	12.3%
Other Material	2.6%
Total Other Material	**29.3%**
TOTAL	**100.0%**

Note: Composition based on 112 samples

East Tennessee

The East Division construction/demolition/bulky waste stream composition includes the average percentage of each material by weight for the 61 material samples visually characterized as part of this study. The most common materials estimated to comprise the construction/demolition/bulky waste stream, by weight, include:

- Treated Wood (21.1 percent),
- Brick, Rubble, Masonry, Concrete, etc. (19.5 percent),
- Drywall (18.5 percent).

Exhibit 15 presents the summary of the construction/demolition/bulky waste stream composition and **Table 18** presents a detailed composition by material type.

Exhibit 15. East Region C&D Material Composition Summary

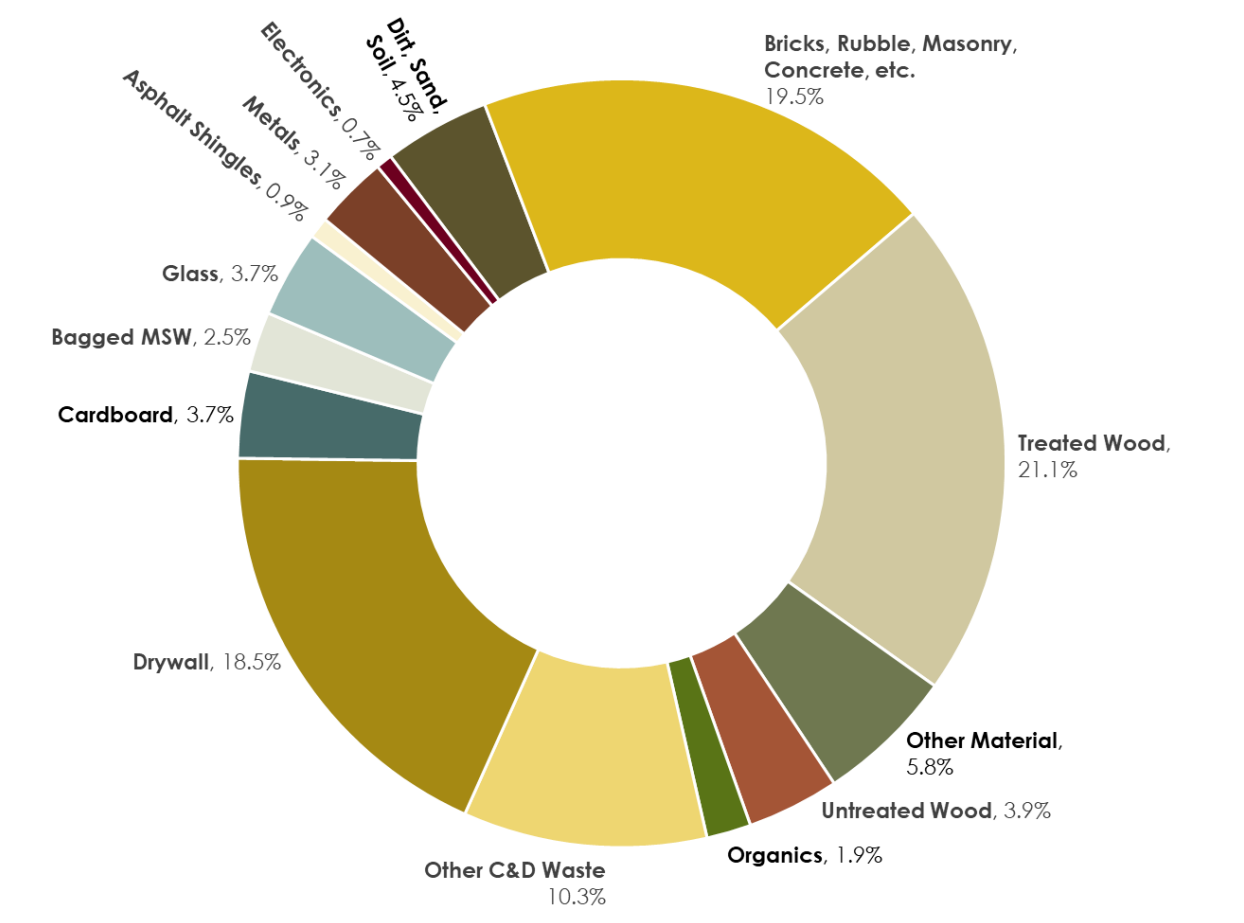


Table 18. East Region C&D Material Composition Detailed

Material Components	Mean Composition
PAPER	
Old Corrugated Cardboard	3.7%
Total Paper	**3.7%**
ORGANICS	
Yard Waste	1.6%
Textiles and Shoes	0.2%
Other Organics	<0.1%
Total Organics	1.9%
METALS	
Ferrous Metals	1.8%
Non-Ferrous Metals	1.3%
White Goods	<0.1%
Total Metals	**3.1%**
GLASS	
Glass	3.7%
Total Glass	**3.7%**
CONSTRUCTION AND DEMOLITION DEBRIS	
Bricks, Rubble, Masonry, Concrete, etc.	19.5%
Drywall	18.5%
Untreated Wood	3.9%
Treated Wood	21.1%
Carpets	1.6%
Asphalt Shingles	0.9%
Insulation	0.2%
Other C&D Waste	8.4%
Total Construction and Demolition Debris	**74.2%**
ELECTRONICS	
Electronics	0.7%
Total Electronics	**0.7%**
OTHER MATERIAL	
Mattresses	0.4%
Tires	<0.1%
Furniture	0.3%
Durable Rigid Plastics	1.9%
Bagged MSW	2.5%
Dirt, Sand, Soil	4.5%
Other Material	3.2%
Total Other Material	**12.8%**
TOTAL	**100.0%**

Note composition based on 61 samples

ESTIMATED ENERGY VALUE

This section presents an estimated energy value analysis of the municipal solid waste stream disposed in the State of Tennessee. Using published literature[2], each material category analyzed for this study was assigned a higher heating value and moisture content. The values were then applied to the overall statewide composition for each of the 10 material categories - including Paper, Rigid Plastic, Film Plastic, Organics, Metals, Glass, C&D Material, Household Hazardous Waste, Electronics, and Other.

This analysis calculates each material's contribution to overall moisture content and Higher Heating Value (HHV) measured in BTU/lb, which is essential for evaluating the energy recovery potential of select waste management processing technologies. Paper (25.4 percent), with low moisture content and a larger higher heating value, and Organics (30.7 percent), with a high moisture content and a lower heating value represent the largest portions of the waste stream. This analysis estimates the overall HHV of the waste stream to be approximately 5,820 BTU/lb. Table 19 includes the results of this analysis.

Table 19. Estimated MSW Stream Heating Value

Material Type	Statewide Waste Composition (%)	Percent Moisture (%)	Overall Moisture Contribution (%)	Higher Heating Value (BTU/lb)	Overall HHV Contribution (BTU/lb)
Paper	25.4%	6.0%	1.5%	7,200	1,832
Rigid Plastic	9.9%	2.0%	0.2%	14,000	1,383
Flim Plastic	9.1%	2.0%	0.2%	14,000	1,277
Organics	30.7%	70.0%	21.5%	2,000	615
Metals	5.0%	3.0%	0.1%	300	15
Glass	3.1%	2.0%	0.1%	60	2
C&D Material	3.0%	8.0%	0.2%	3,000	91
HHW	0.7%	20.0%	0.1%	8,000	57
Electronics	0.8%	20.0%	0.2%	60	1
Other	12.2%	20.0%	2.4%	4,500	549
TOTAL	**100.0%**		**26.6%**		**5,820**

GATE SURVEYS

SCS personnel surveyed incoming waste loads at select solid waste facilities to estimate the sources of municipal solid waste generated and disposed in the State of Tennessee. The goal of the gate surveys was to collect information on the amount of waste disposed by the residential and commercial generating sectors. Vehicles and waste screened as part of the gate surveys included only waste generated in Tennessee. If waste was identified as having originated from a state outside of Tennessee the survey on that load was not completed. If the driver indicated the waste originated

[2] Brunner and Schwarz (1983) Solid Waste Handbook

in Tennessee, field personnel asked the driver to identify the primary source of the material. If loads were identified as mixed residential and commercial, the driver was asked to estimate the percentage of the material from each source. Interviewing drivers for the gate surveys occurred after they had entered the solid waste facility and had received their scale ticket. Field personnel requested to see each driver's scale ticket to record the net weight of each load. Gate surveys captured data from a total of 429 waste collection records across the three geographic regions of Tennessee: West, Middle, and East.

Overall, the surveys collected data on approximately 3,195 tons of waste statewide, with 2,017 tons classified as residential (63.1 percent) and 1,178 tons as commercial (36.9 percent). Results show the West Tennessee region had the most balanced split with 50.7 percent residential and 49.3 percent commercial (464 vs. 451 tons). Middle and East Tennessee data indicate that residential waste is the predominate type of MSW disposed of in these regions. **Exhibit 16** presents the average statewide distribution of residential and commercial MSW.

Exhibit 16. Statewide MSW Distribution

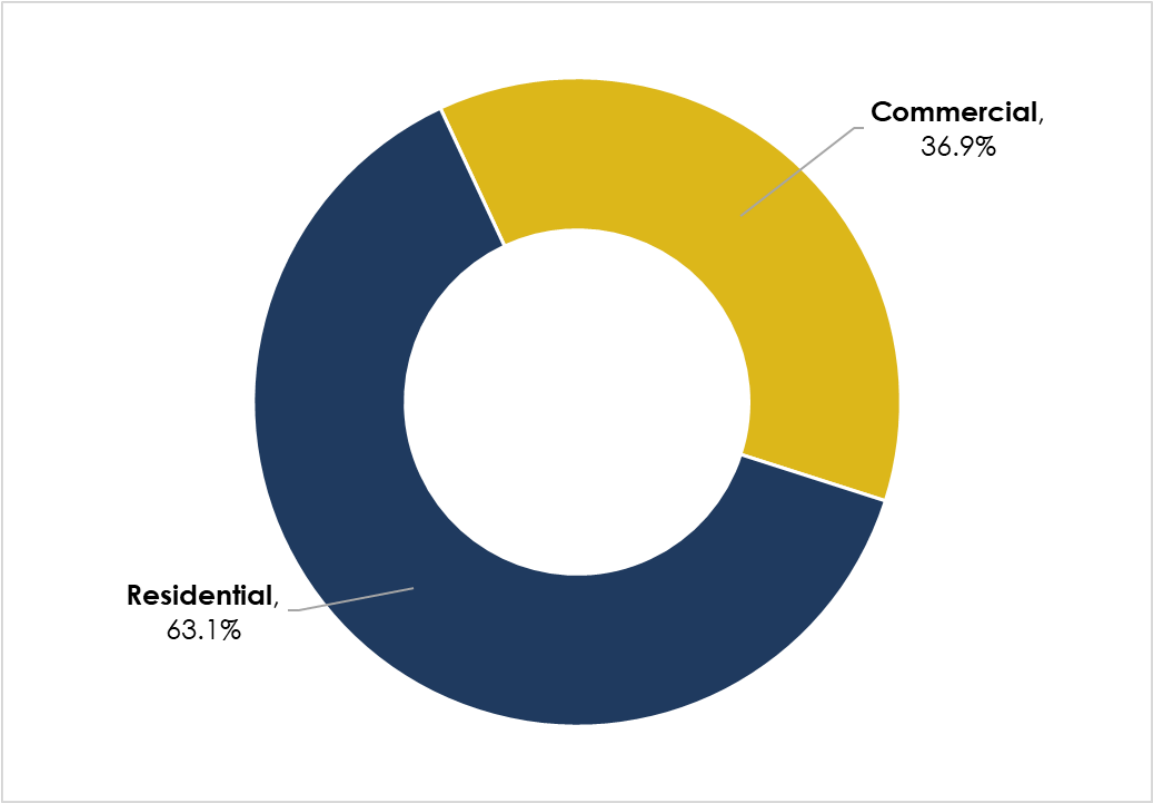
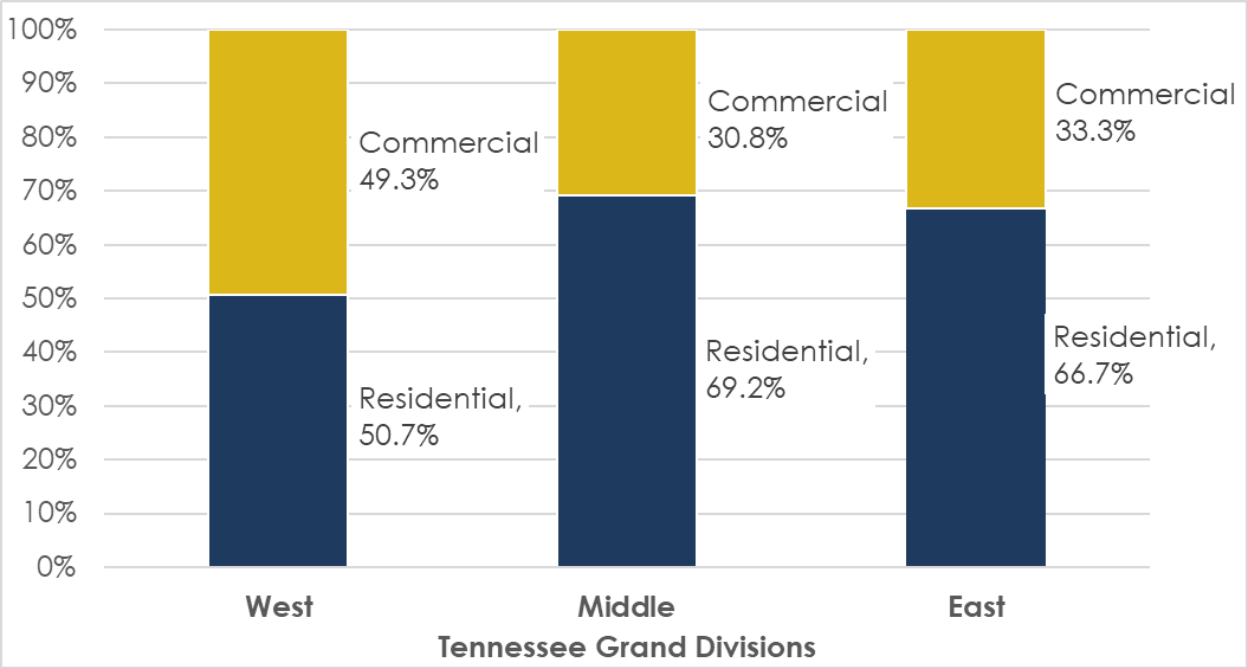


Exhibit 17 presents the distribution of residential and commercial MSW by Tennessee's grand divisions.

Exhibit 17. MSW Distribution by Grand Division



SURVEYS

Residential Food Waste Management

The Residential Food Scrap Management Survey was developed to better understand how households currently manage uneaten food and inedible food scraps, as well as residents' awareness of and interest in alternative food waste diversion options such as home composting, drop-off programs, and subscription or curbside collection services. The survey is designed to collect information on household characteristics, existing food scrap disposal practices, perceived barriers to participation in composting programs, and overall attitudes toward food waste reduction and sustainability initiatives. These data should provide insight into both the scale of residential food waste generation and the behavioral, logistical, and service-related factors that influence participation in food waste diversion programs across Tennessee.

The intended audience for this survey included residents that generate food waste and discard it for disposal or place it in systems for recovery (i.e. composting, anaerobic digestion). Results of this study should be relevant to local governments, waste service providers, and composting or organics processing facilities as they assess potential demand for residential food waste collection or support services. More broadly, the survey findings are intended to inform planning level decisions related to food waste reduction strategies, public education needs, and the feasibility of expanding residential food waste management programs within the state. The survey was not distributed as part of this study. The survey can be found in **Appendix E.**

Commercial Recycling Backhauling

The Quantifying Internally Managed Commercial Recyclable Materials in Tennessee Survey was developed to improve understanding of commercial recyclable materials that are diverted from disposal through on-site or internally managed practices rather than through traditional municipal or private recycling collection systems. Some businesses manage recyclable materials such as corrugated cardboard, pallets, yard waste, or organics internally by reusing, densifying, donating, composting, or otherwise diverting materials prior to entering the solid waste stream. These activities are often not captured in disposal or recycling tonnage data, resulting in an incomplete picture of material recovery occurring across the state. This survey seeks to identify the types of recyclable materials internally managed, estimate the quantities managed through internal programs, and characterize the business sectors engaging in these practices. The resulting data may support a more accurate assessment of commercial sector diversion and help inform statewide waste characterization, recycling rate estimates, and solid waste management planning efforts in Tennessee.

The primary audience for this survey includes staff at companies and organizations that may manage recyclable materials on their own. By documenting internally managed recyclable materials, the survey provides decision-makers with data needed to better evaluate existing diversion pathways, identify opportunities to expand recovery outside of traditional collection programs, and recognize the role that commercial generators play in reducing disposal and supporting a more circular materials economy in Tennessee. The survey was not distributed as part of this study. The survey can be found in **Appendix E**.

Understanding Food Waste Diversion Practices

This section summarizes the findings from a statewide survey conducted to assess current food waste management practices, community attitudes, existing infrastructure, and barriers to food waste diversion across the State of Tennessee. The survey collected 44 responses from local government officials and solid waste coordinators between December 2025 and March 2026, providing insights into the current landscape of food waste management across the state's three grand divisions.

Introduction and Methods

The survey targeted individuals with knowledge of local solid waste management operations, including county-level solid waste coordinators, mayors, government officials, and regional authority representatives. Respondents represented communities across all three grand divisions of Tennessee: West, Middle, and East. The majority of respondents (approximately 82 percent) identified as county-level solid waste coordinators, with additional responses from mayors, county commissioners, and regional authority coordinators.

The survey addressed several key areas: respondent demographics and professional roles, geographic location, community support levels for sustainable waste management, awareness of existing food waste policies and collection services, knowledge of processing facilities, public interest in food waste programs, and perceived barriers to program implementation.

Results

Survey responses were distributed across Tennessee's three grand divisions, with the highest concentration from East Tennessee (18 responses), followed by Middle Tennessee (21 responses), and West Tennessee (5 responses). This distribution provides reasonable coverage of the state's diverse geographic and demographic characteristics.

Community Support

Community support for sustainable solid waste management efforts varied considerably across respondents. On a scale of 1 to 5, responses ranged from moderately unsupportive (rating of 2) to highly supportive (rating of 5). Several communities in Knox County, Shelby County, Rhea County, Blount County, Cheatham County, and Hickman County reported the highest levels of community support (rating of 5), suggesting strong public interest in waste reduction initiatives in these areas. However, multiple counties, including McMinn, Chester, Hardin, Gibson, Marion, and Smith, reported lower support levels (rating of 2), indicating potential challenges in implementing new food waste programs in these communities.

Planning and Collection

The survey revealed significant gaps in formal food waste planning at the local level. When asked whether local solid waste planning documents discuss or address food waste minimization and diversion, most respondents (approximately 68 percent) indicated "No," while others responded "Unknown" or "Maybe." Only five respondents confirmed that their local planning documents address food waste: Roane County, Sevier County, Franklin County, Putnam County, and Cheatham County.

Similarly, existing food waste collection services remain limited across the state. Most respondents (approximately 77 percent) reported that no separate food waste collection services are provided by private haulers, municipalities, or other entities in their communities. Only four respondents indicated awareness of such services: Knox County mentioned the University of Tennessee Composting Facility (limited to students and faculty), Wayne County referenced the Turney Center Annex hauling food waste to Hickman County for composting, Shelby County identified Life Building Incorporated, and Roane County noted food waste diversion by Kroger, Walmart, and TVA Kingston.

Infrastructure

The availability of non-disposal facilities that accept source-separated food waste for beneficial use remains limited throughout Tennessee. Approximately 73 percent of respondents indicated that no such facilities exist in their communities, with several others responding "Unknown." Notable exceptions include:

- Knox County: University of Tennessee Composting Facility (students and faculty only)
- Bradley County: NewTerra Composting at North Farmers Market (requires additional advertising)
- Shelby County: Life Building Incorporated, operated by Hosea Houston
- Washington County: Hoffman Composting in Johnson City
- Sevier County: A facility that processes all MSW including organics (not source-separated)
- Cheatham County: The Compost Company

The Sevier County response highlights an important distinction: their facility accepts all municipal solid waste and processes organics without requiring source separation, which represents a different operational model than traditional source-separated food waste composting.

Public Interest and Demand

Public interest in source-separated food waste collection varies considerably across communities. Approximately 23 percent of respondents indicated definitive public interest ("Yes"), including Knox County, Fentress County, Bradley County, and Shelby County. However, a significant portion (approximately 32 percent) responded "Maybe," suggesting uncertain or emerging interest, while approximately 27 percent reported no public interest. The remaining respondents indicated uncertainty about public demand.

This mixed response suggests that public education and awareness campaigns may be necessary precursors to successful program implementation in many communities.

Barriers to Food Waste Diversion

The survey identified numerous barriers to starting or expanding food waste diversion programs. The most frequently cited barriers include:

- **Unavailable Processing Facilities:** This emerged as the most cited barrier, mentioned by approximately 70 percent of respondents. The lack of local composting sites, anaerobic digesters, or other processing infrastructure represents a fundamental obstacle to program development.

- **Cost Considerations:** Financial constraints were cited by approximately 55 percent of respondents as a significant barrier. This includes capital costs for equipment, operational expenses, staffing, and the absence of sustainable funding mechanisms.

- **Unknown or No Demand for End Products:** Approximately 50 percent of respondents expressed concern about the marketability of finished compost or other end products, reflecting uncertainty about the economic viability of food waste processing operations.

- **Equipment Limitations:** Many communities lack the specialized equipment necessary for food waste collection and processing, with approximately 45 percent of respondents identifying this as a barrier.

- **Staffing Challenges:** Personnel shortages and the need for specialized training were cited by approximately 40 percent of respondents as obstacles to program implementation.

- **Lack of Processing Knowledge:** Technical expertise gaps were noted by approximately 35 percent of respondents, suggesting a need for educational resources and training programs.

- **Potential Facility Neighbors:** Community opposition to siting composting or processing facilities was mentioned by some respondents, particularly in Knox County, where past experiences with composting operations have created public resistance.

Additional barriers mentioned by individual respondents include difficulties in waste segregation, rural community characteristics limiting feasibility, and competing priorities for existing recycling programs.

Recommendations and Considerations from Respondents

Several respondents provided constructive feedback and recommendations for TDEC consideration that included the following:

- **Public Education Campaigns:** Multiple respondents suggested expanding public awareness efforts, including suggestions to leverage the "Nobody Trashes Tennessee" campaign to promote composting and highlight the environmental impact of food waste in landfills.

- **Regional Partnerships:** Smaller counties may benefit from partnering with neighboring jurisdictions to achieve economies of scale in collection and processing operations.

- **Private Sector Engagement:** Several respondents expressed interest in promoting private sector solutions rather than public sector operation of composting facilities.

- **Backyard Composting Promotion:** Some communities are already providing education and compost bins (such as Earth Machine units) to encourage residential composting as an alternative to centralized collection. By managing food waste on the property where it is generated, it saves energy and staff resources in the public or private sector from having to collect, transport, and process the materials.

Summary

The survey results indicate that Tennessee faces significant challenges in expanding food waste diversion programs, including limited processing infrastructure, financial constraints, uncertain end-product markets, and varying levels of public interest and community support. However, pockets of activity and interest exist throughout the state, particularly in larger urban areas and communities with higher baseline support for sustainable waste management.

Moving forward, TDEC may consider targeted investments in processing infrastructure development, technical assistance programs for local governments, public education initiatives, and exploration of regional partnership models to address the systemic barriers identified through this survey. The responses also suggest that private sector engagement and market development for compost products should be priorities in developing a comprehensive statewide food waste diversion strategy. The survey can be found in **Appendix E**.

5 RECOMMENDATIONS

Based on the Tennessee Statewide Waste Characterization Study data collected and analyzed, Tennessee's waste stream presents significant opportunities for increased waste reduction and diversion. The composition data reveals that **approximately 70-75 percent of Tennessee's waste stream consists of potentially recyclable or compostable materials** that are currently being landfilled. This discussion presents evidence-based policy recommendations organized into six strategic focus areas to help Tennessee achieve meaningful improvements in waste diversion rates.

ORGANICS

According to the composition data organic materials constitute 30.7 percent of Tennessee's overall waste stream - the single largest material type measured. This breaks down as follows:

Organic Material Type	Overall Composition	Residential Composition	Commercial Composition
Wasted Food (Edible)	15.1%	14.5%	15.9%
Wasted Food (Inedible)	4.7%	4.5%	4.9%
Yard Waste	2.2%	2.7%	1.5%
Textiles and Shoes	5.2%	5.0%	5.4%
Wood (Non-C&D)	0.4%	0.3%	0.5%
Other Organics	3.2%	4.0%	2.1%
Total Organics	**30.7%**	**31.0%**	**30.4%**

- Commercial Food Waste Recovery Infrastructure Investment - The commercial sector data shows that 20.8 percent of commercial waste is wasted food (edible and inedible) - the highest among all material types. Recommended support the State of Tennessee might provide includes:
    - Grants for municipal and non-profit composting facilities across all three grand divisions (West, Middle, and East Tennessee)
    - Tax incentives for businesses installing food waste processing equipment
    - Public-private partnerships for anaerobic digestion facilities to capture energy value
- Statewide Organics Diversion Goal for Large Generators – The State of Tennessee might consider implementing a phased organic waste disposal diversion goal modeled after other successful state programs. Such a program would establish thresholds by which organic waste generators would be asked to divert organic waste material from disposal. An example program

might be like the example program below with specific thresholds and timelines to be set by TDEC after stakeholder engagement:

  - **Phase 1 (Year 1-2):** Require commercial generators producing >2 tons/week of food waste to divert organic materials
  - **Phase 2 (Year 3-4):** Reduce threshold to >1 ton/week
  - **Phase 3 (Year 5+):** Reduce threshold to >0.5 tons/week

- **Residential Organics Collection Programs** – With 19.0 percent of residential wasted food (edible and inedible food items), the State of Tennessee might consider the following options:

  - Provide matching grants for municipalities implementing curbside organics collection
  - Support community composting programs in urban and suburban areas
  - Fund educational campaigns on backyard composting techniques

- **Food Rescue and Donation Programs -** Given that wasted food (edible) alone represents 15.1 percent of the total waste stream, the State of Tennessee might consider the following options:

  - Create tax incentives for food donation beyond federal deductions
  - Fund regional food bank infrastructure and transportation networks
  - Establish a statewide food rescue coordination platform in conjunction with the Get Food Smart TN program

PAPER AND CARDBOARD RECOVERY ENHANCEMENT

The composition data reveals that paper materials comprise 25.4 percent of Tennessee's overall waste stream, making it the second-largest category:

Paper Material Type	Overall Composition	Residential Composition	Commercial Composition
Compostable Paper	6.4%	6.6%	6.2%
Old Corrugated Cardboard (OCC)	7.2%	4.6%	10.6%
Paperboard	4.4%	5.3%	3.1%
Mixed Paper	2.3%	2.1%	2.5%
Sorted Office Paper	2.0%	2.3%	1.7%
Newspapers/Magazines	0.8%	1.0%	0.6%
Other Paper (non-recyclable)	2.3%	2.1%	2.5%

Paper Material Type	Overall Composition	Residential Composition	Commercial Composition
Total Paper	25.4%	24.0%	27.3%

The data shows a significant disparity: Old Corrugated Cardboard represents **10.6 percent of commercial waste** stream compared to only 4.6 percent of the residential waste stream. This indicates substantial commercial OCC is being disposed rather than recycled, despite cardboard having established markets.

- **Commercial Cardboard Recycling** - Given that OCC is the most valuable and market-ready paper commodity, the following policy recommendations may support additional recovery of this material:
    - Encourage all commercial establishments generating >50 pounds/week of cardboard to recycle
    - Encourage the inclusion of recycling provisions in commercial lease agreements for multi-tenant properties

- **Strengthen Single-Stream Recycling Programs** - Data from the single stream MRF indicates significant contamination issues, with bagged MSW representing 5.9 percent and bagged recycling 3.1 percent of recycling stream samples. To address this the State of Tennessee might consider the following initiatives:
    - Fund contamination reduction education campaigns
    - Support automated sorting technology upgrades at MRFs
    - Encourage the establishment of standardized acceptable materials lists across the state

- **Support for Paper Mill Development** – The State of Tennessee may consider the following initiatives:
    - Provide economic development incentives for paper mills that prioritize the use of recycled paper
    - Create partnerships with regional paper manufacturers to expand the dialogue for how to make paper recycling more successful throughout the State
    - Support research into new applications for recovered paper fiber

- **Compostable Paper Diversion** – With 6.4 percent of waste being compostable paper (pizza boxes, paper towels, food-soiled paper), opportunities to encourage the diversion of this material might include:
    - Study the barriers and inclusion of compostable paper in organic waste collection programs and composting facilities

- Develop clear labeling standards for compostable vs. recyclable paper products
- Support industrial composting facilities that accept paper products

PLASTICS MANAGEMENT AND REDUCTION

The overall waste stream composition for the State of Tennessee contains 18.9 percent plastics (rigid plastics and film). Given plastic waste comprises nearly one-fifth of the disposed waste stream, it is recommended the State consider the following policy and program initiatives to reduce and divert this material.

- Film Plastic Collection Programs – Film plastics in particular represent 9.1 percent of the waste stream but are typically excluded from curbside programs. Key options for preventing disposal and increasing diversion include the following:

  - Support retail take-back programs for plastic bags and film
  - Investigate chemical recycling technologies for film plastics
  - Partner with retail chains to expand store drop-off locations
  - Fund consumer education on film plastic recycling opportunities

- Reusable and Refillable Container Programs – PET #1 plastic comprises about three percent of the disposed waste stream. Visual observations from field activities indicate that a significant portion of PET #1 plastic is single-use disposable beverage bottles. In an effort to reduce plastic waste, the State of Tennessee might consider the following initiatives:

  - Pilot reusable container programs at universities and state facilities
  - Support businesses implementing refill/reuse models

METALS AND GLASS RECOVERY OPTIMIZAITON

Metals are often the most valuable part of a recycling program. The data shows 2.5 percent of the disposed waste stream is metal containers that in most cases are part of community recycling programs. Another 2.5 percent of the waste stream is other metal that may be recycled through other (non-curbside) recycling programs. Additionally, glass comprises 3.1% of Tennessee's overall waste stream.

- Aluminum Can Recovery Enhancement - Although aluminum cans comprise only 1.3 percent of the waste stream, their disposal represents a significant unrealized value. This is particularly important for recycling programs that often rely on rebates from higher value materials to sustain the overall program. To facilitate increased recovery of aluminum cans, the State of Tennessee might consider the following activities:

  - Partner with scrap metal industry for targeted collection programs
  - Support can collection at events, parks, and public spaces
  - Expand redemption center access in underserved communities
  - Educational campaigns on aluminum's high recycling value

- Glass Collection and Processing – To address challenges with the recovery and recycling of glass the following recommendations may be considered:

- Invest in glass beneficiation facilities to improve material quality
- Develop alternative end markets (i.e., aggregate, filtration media)
- Consider glass-specific collection to reduce contamination in other recycling program types

- **Scrap Metal Diversion from Disposal** – The 2.2 percent of waste comprised of "other" ferrous and non-ferrous metals represents valuable materials that are currently being lost to disposal. The following efforts may assist in the recovery of this portion of the waste stream:

  - Require MRFs to maximize metal recovery from residuals
  - Support small-scale metal recovery at transfer stations
  - Strengthen scrap metal dealer regulations to prevent illegal dumping

CONSTRUCTION AND DEMOLITION AND SPECIAL WASTE MANAGEMENT

Construction and demolition materials represent 3.0 percent of Tennessee's MSW stream (higher percentages exist in dedicated C&D streams not fully captured here):

- **C&D Recycling Recommendations** - Tennessee may consider implementing C&D diversion recommendations for construction and demolition projects, particularly projects on state properties. These recommendations may include requesting C&D recycling plans for projects over $500,000, setting incremental minimum diversion rates (for example 50 percent by 2028, 75 percent by 2035, etc.); developing C&D processor certification standards; creating incentives for deconstruction vs. demolition activities

- **Carpet Stewardship Program** - With carpet at 0.6 percent of the waste stream the State may consider activities to support voluntary carpet recovery/reuse programs, partner with carpet recycling processors, promote Carpet America Recovery Effort (CARE) participation

- **Electronics Waste Management Enhancement** - Electronics comprise 0.8 percent of the stream. Efforts to divert this valuable and potentially hazardous material include:

  - Strengthen e-waste collection infrastructure
  - Support manufacturers' take-back programs
  - Confirm proper data destruction and materials recovery

- **Household Hazardous Waste Programs** - HHW at 0.7 percent of waste includes batteries, oil, paint, antifreeze, and other HHW:

  - Expand permanent HHW collection facilities statewide
  - Increase frequency of mobile HHW collection events
  - Support used oil recycling infrastructure

- **Tire Management** - Though tires represent only 0.4% of MSW, proper management is critical:

  - Maintain and strengthen tire processor licensing
  - Support tire-derived fuel and rubber mulch markets
  - Address legacy tire pile remediation on public property

IMPLEMENTATION FRAMEWORK AND CROSS-CUTTING STRATEGIES

Regional Considerations

This study measured and collected data for Tennessee's three grand divisions to provide information that may facilitate regional approaches to reduce disposal and encourage waste prevention and recycling. Implementation of recommendations should consider:

- **Urban vs. Rural:** Different infrastructure needs and collection economics
- **Regional Markets:** Proximity to end markets varies across the state
- **Local Capacity:** Municipal staffing and budgets vary significantly

Cross-Cutting Policy Recommendations

1. Statewide Recycling Goal and Measurement

- Require standardized reporting from all haulers and facilities
- Publish annual progress reports with county-level data
- Create accountability mechanisms for goal achievement

2. Funding Mechanisms

Sustainable funding is essential for program success:

- **Solid Waste Disposal Surcharge:** Increase per-ton disposal fees to fund recycling
- **Grant Programs:** Continue and expand TDEC grant programs for local infrastructure
- **Green Bonds:** Issue bonds for major infrastructure investments

3. Education and Outreach

The recycling stream data shows significant contamination issues, indicating education needs:

- Statewide "Recycle Right Tennessee" campaign
- Standardized recycling education in K-12 curriculum
- Multi-language outreach materials
- Social media and digital engagement strategies
- Business technical assistance programs

4. Market Development

Strong end markets are essential for recycling success:

- Create state procurement preferences for recycled-content products
- Support manufacturing facilities using recycled feedstocks
- Partner with economic development agencies on recycling industry recruitment
- Invest in research on emerging recycling technologies

INFRASTRUCTURE INVESTMENT PRIORITIES

Based on material composition priority investments should target:

1. **Composting/Anaerobic Digestion** (30.7% organics)
2. **MRF Upgrades** (contamination reduction)
3. **Transfer Stations** (rural collection efficiency)
4. **Film Plastic Processing** (9.1% of waste stream)
5. **Glass Beneficiation** (improve material quality)

Regulatory Framework Updates

- Update solid waste regulations to reflect modern materials
- Establish material-specific handling requirements
- Create certification programs for recycling facilities
- Strengthen enforcement for illegal dumping and improper disposal

SUMMARY: PRIORITY ACTIONS BY IMPACT POTENTIAL

Priority	Initiative	Waste Stream Impact	Implementation Timeframe
1	Organic Waste Programs	30.7% of waste	2-5 years
2	Commercial Cardboard Mandate	10.6% of commercial	1-2 years
5	C&D Recycling Recommendations	3.0% of MSW	2-3 years
6	Film Plastic Collection	9.1% of waste	2-4 years

Conclusion

The Tennessee Statewide Waste Characterization Study data reveals that approximately 70-75 percent of Tennessee's current waste stream consists of potentially recoverable materials. The largest opportunities exist in:

1. **Organics** (30.7 percent) through composting, anaerobic digestion, and food rescue
2. **Paper/Cardboard** (25.4 percent) through enhanced recycling and diversion programs
3. **Plastics** (18.9 percent) through film collection and infrastructure investment

By implementing the policy recommendations outlined in this discussion—with appropriate funding, education, and regulatory support—Tennessee can significantly increase waste diversion rates, reduce landfill dependency, create green jobs, and contribute to environmental sustainability goals.

The data-driven approach using composition study results ensures that resources are directed toward the highest-impact opportunities.

Appendix A

Sample Site-Specific Health and Safety Plan

Site-Specific Health and Safety Plan for TDEC Statewide Waste Characterization Study

Bi-County Solid Waste Landfill

3212 Dover Road
Woodlawn, TN 37191

November 17-21, 2025

REQUIRED APPROVAL			
SCS OSHC or designee:	Jared Hamela	Date:	
SCS PM	Brent Dieleman	Date:	11/13/2025
SCS Field Manager:	Brent Dieleman	Date:	11/13/2025

Project No.:	02224033.00
Project Name:	TDEC Statewide Waste Characterization
Primary Site Address:	3212 Dover Rd, Woodlawn, TN 37191
Client Contact:	Mark Neblett

EMERGENCY TELEPHONE NUMBERS	
Fire:	911 or (931) 645-7456 (non-emergency)
Police:	911 or (931) 648-0656 (non-emergency)
Hospital	Tennova Healthcare – Clarksville 651 Dunlop Ln Clarksville, TN 37040 (931) 502-1000
Ambulance:	911
WorkCare	(888) 449-7787 (for SCS staff health issues)
The directions and information on the nearest hospital are found on Page 3.	

ACKNOWLEDGEMENT PAGE

"I have read the Health and Safety Plan for the TDEC Statewide Waste Characterization Study. I have discussed any questions and/or concerns regarding the contents of this document with the designated SCS project safety representative, and I understand its requirements. I understand that failure to comply with safety regulations and this Health and Safety Plan, as well as failure to use safety and personal protective equipment or wandering outside of the area designated by the SCS Field Manager, shall be grounds for immediate dismissal."

Name	Signature	Company	Date

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1 INTRODUCTION

At SCS, protection of human health and the environment is paramount. This Site-Specific Health and Safety Plan (SSHSP) provides information to identify hazards that may be present and/or introduced by the activities completed for this project and details needed precautions that employees should follow to protect themselves. Tasks performed on the job site during the project should be analyzed to understand if physical or chemical hazards requiring safeguards or additional Personal Protective Equipment (PPE) exist. This plan will be modified as necessary if new hazards are identified during the project that require additional safeguards be put in place. The contents and requirements in this plan apply to SCS staff and subcontractors working at the Bi-County Solid Waste Landfill located at 3212 Dover Road, Woodlawn, TN 37191.

PROJECT ORGANIZATION

SCS Field Manager:	Brent Dieleman	202-841-9827
SCS Project Manager:	Brent Dieleman	202-841-9827
SCS Project Director	Stacey Demers	703-929-2986
Bi-County Solid Waste Balefill/Landfill Client Contact	Mark Neblett	931-320-2059

SCOPE OF WORK – WASTE CHARACTERIZATION

Waste characterization involves collecting field samples and sorting municipal solid waste and recyclable materials into designated categories. The data that is generated from the field activities will be compiled and provided to the Tennessee Department of the Environment (TDEC).

There have been no reported serious or fatal incidents attributed specifically to the performance of waste characterization studies. However, accidents may occur due to the potential hazards associated with the presence of heavy equipment at the site, the components of the waste itself (potentially sharp objects, broken glass), climatic conditions, and carelessness.

The presence of heavy equipment in operation at the site (end loaders, graders, compactors, garbage trucks, etc.) presents potential hazards which can be avoided using general common sense and staying visible. The equipment operators generally are involved in performing their tasks and may be unaware of the presence of other individuals within the immediate area. Personnel will be trained to be aware of the movement and location of equipment at all times. Wearing high-visibility safety vests and hard hats is required at all times while onsite.

The components of municipal solid waste present potential physical hazards. These include, but are not limited to, cuts from broken glass and sharp metal objects; splinters from pieces of wood; punctures from nails, needles, or other sharp objects; and scrapes and abrasions from the general handling of solid waste. There also exists the potential for exposure to household products, such as bleach, cleaners, and other toxic chemicals.

To alleviate the possibility of injury, caution should be employed at all times when physically handling the waste and recyclable materials. Protective clothing, including nitrile and puncture-resistant gloves

and safety glasses, should be worn at all times. If there is any question about the handling of a component of solid waste, the SCS Field Manager should be notified.

Waste characterization will be performed in an area that may not be climate controlled. Caution should be taken to avoid the possibility of heat stress due to protective clothing or weather, or frostbite in areas of extreme cold. Depending on temperature, portable heaters may be used to warm sorting personnel.

Refuse deposited at the work site can pose a potential fire hazard. Fires can be started through carelessness, sparks, or from "Hot Loads" handled at the work sites. If fire or smoke is observed, the site representative should be notified immediately. All SCS personnel and subcontractors should leave the immediate area at once, and the local emergency fire department should be notified.

2 EMERGENCY RESPONSE AND MEDICAL TREATMENT PROCEDURES

EMERGENCY CONTACT AND NOTIFICATION INFORMATION

Nearest Emergency Medical Facility Address from 3212 Dover Rd:

Ascension Saint Thomas Urgent Care Clarksville
1690 Fort Campbell Blvd
Clarksville, TN 37042
(931) 648-4838

Map and turn by turn directions are as follows:

- Start at 3212 Dover Rd
- Turn **left** onto US-79 N (4.9 miles)
- Take the TN-374 S **exit** (0.6 miles)
- Continue onto TN-374 S (3.8 miles)
- Use the **right** lane to take the US41A/Ft Cambell Blvd Ramp (0.3 miles)
- Use the **right** lane to turn **right** onto Fort Campbell Blvd (413 feet)
- Turn **right** to arrive at 1690 Fort Campbell Blvd

Map and directions from the Bi-County Solid Waste Landfill to Ascension Saint Thomas Urgent Care, Fort Campbell

ACCIDENT OR INCIDENT REPORTING SYSTEM

In the event of an emergency at the work site, project personnel should call 911 for emergency assistance. After the immediate emergency situation has been addressed by emergency personnel, The SCS Field Manager should call the SCS Project Director as well as the Client Services Manager and inform them of the situation. The SCS Project Manager or Director should evaluate the nature of the emergency and direct project personnel actions from that point.

METHODS TO SUMMON EMERGENCY RESPONSE TEAM

Emergency services can be summoned through 911, as this service is active in the area.

RESCUE AND MEDICAL TREATMENT REQUIREMENTS

SCS field staff will exercise their stop work authority when an injury or accident occurs. The appropriate emergency agency will be contacted and first aid administered, if possible. For SCS staff injuries and health issues that are not life-threatening and do not require emergency response, WorkCare will be contacted at (888) 449-7787. A first aid kit is available at the sorting site and in SCS owned vehicles (if onsite).

3 SITE DESCRIPTION

LOCATION DESCRIPTION

Field activities for this project will take place at:

Bi-County Solid Waste Balefill/Landfill
3212 Dover Rd
Woodlawn, TN 37191

4 GENERAL FIELD SAFETY PROCEDURES

General Standard Operating Procedures (SOPs) and additional SCS Health and Safety procedures and requirements are included in the current SCS Injury Illness Protection Program (IIPP) and on the SCS intranet. These documents are considered a part of this plan.

SCS team members will conduct themselves in a professional manner at all times. The following restrictions will also be observed by all SCS field staff and subcontractors.

- Working under the influence of intoxicants, narcotics, or controlled substances is prohibited.
- Smoking is only allowed in designated areas.
- Loose clothing will not be worn on-site; No unapproved work clothes or equipment will be allowed on-site; long hair will be worn up inside (hard) hat.
- Eating, drinking, chewing gum, smoking, or any practice that increases the probability of hand-to-mouth transfer and ingestion of material is prohibited from the immediate material sampling and sorting locations; designated break areas will be established.
- No personnel will be admitted to the site without the proper safety equipment, clearance or other approval.
- All personnel must comply with established safety procedures. Any staff member who does not comply with safety policy, as established by the SCS Field Manager, will be immediately dismissed from the site.
- Prescription drugs should not be taken by personnel where the potential for contact with toxic substances exist. Use must be specifically approved by a qualified physician.
- No weapons or firearms are allowed onsite.
- Work areas for sampling and sorting activities will be established.
- Work areas will be established based on prevailing site conditions and are subject to change. Personnel should check with the SCS Field Manager for current and appropriate procedures regularly.
- Contact with contaminated or potentially contaminated material should be avoided. Whenever possible, do not walk through puddles, mud, or any discolored ground surface. Do not kneel

on the ground. Do not lean, sit or place equipment on drums, containers, or vehicles.

- Due caution will be observed when proceeding on foot through open areas. Personnel will not cross the established barrier that will separate the sorting area from the area where heavy equipment will be operating.

- Any medical emergency supersedes routine safety requirements.

- Staff shall know their own capabilities and not lift any material, container, etc. that is heavy or awkwardly shaped without assistance from at least one other person.

APPLICABLE STANDARD OPERATING PROCEDURES (SOPS) AND PROGRAMS

The following SOPs are incorporated by reference and available on the SCS intranet.

	SOP Number and Name		SOP Number and Name
X	01 - General Code of Safe Work Practices		22 - Safe Procedures for Working with Sites That Contain Hydrogen Sulfide
X	04 - JTSA and PPE Assessment Procedures	X	24 - Avoidance of Slips, Trips, and Falls
	05 - Work Permits	X	25 - Avoidance and Prevention of Heat and Cold Stress, and Other Weather-Related Hazards
	06 - Forklift and Heavy Machinery Operations		26 - All-Terrain Vehicles and Watercraft
	07 - Compressed Air and Compressed Gas Cylinders		27 - OSHA and Other Regulatory Inspections
	08 - Drilling and Well Installation Procedures		
	09 - Electrical Safety		**Appendix Letter and Program Name**
	10 - Fall Protection	X	B - Hazard Communication
X	11 - Fire Extinguishers		C - HAZWOPER
	12 - Hand and Power Tools		D - Exposure Assessment
	13 - Working Safely with Ladders	X	E - PPE Other Than Respiratory Protection
	14 - Landfill Leachate and Condensate Safe Procedures		F - Respiratory Protection
	15 - Lockout and Tagout	X	G - Motor Vehicle and Fleet Safety
X	17 - Materials Use and Handling		H - Hearing Conservation
	18 - Polyethylene (PE) Pipe Work Safe Procedures	X	I - Bloodborne Pathogens
X	19 - Site Sanitation Procedures		J - Excavation and Construction Earthwork Program
	20 - Safe Work Practices for Scaffolds		K - Confined Space Entry
X	21 - Safe Procedures for Biological Hazards (Snakes, Insects, Vegetation, Bacteria)	X	L - Ergonomics Program

JOB TASK SAFETY ANALYSIS (JTSA) AND PPE ASSESSMENT

JTSAs for activities performed at the work site have been completed as indicated below and are included as **Attachment 1**. A completed JTSA is required for all work tasks performed at the site. JTSAs are designed to identify steps that involve potential hazards to employees and should be reviewed and understood (and signed providing evidence of understanding) before performing any task at the site. If additional steps or hazards are present, the JTSA should be revised (and the revision signed by all affected staff) to indicate that all items have been appropriately addressed and are understood before proceeding with the task.

Unless identified in an attached Job Task Safety Analysis (JTSA) form, all project tasks are anticipated to only require **Level D** PPE, as defined by the Occupational Safety and Health Administration (OSHA).

SCS field personnel (including subcontractors) will be informed in the use of safety equipment and will be required to wear PPE appropriate for the tasks in which they will be involved, including:

- Gloves (nitrile and HexArmor needlestick and puncture resistant gloves)
- High Visibility Safety Vests
- Eye Protection
- Steel-toe boots/shoes
- Hard hats, if required by the site

Extra PPE will be located on-site. The following additional PPE will be provided, but not required to be worn:

- Dust Masks
- Coveralls

Sufficient water for personal use will be brought on-site daily.

INSPECTION PROCEDURES

Periodic site inspections may be made by the SCS Project Director and/or Client Services Manager. There is also the potential for the client or a regulatory agency to visit and observe the work area. SCS personnel are to perform tasks in compliance with all contractual, regulatory, and company requirements at all times.

SITE CONTROL

SCS and its subcontractors will be restricted in site usage to the designated sampling and sorting areas. SCS will rely on client or host facility personnel to transfer material samples from the sampling area to the sorting area.

Our clients are responsible for providing SCS employees with safe site access and work area. This includes work areas that are free of threats from transients or other aggressive people or animals. If an SCS team member encounters an aggressive person or animal, they will withdraw from the site and contact the Client Representative, SCS Project Director and SCS Client Services Manager. The client is responsible for removing the threats. SCS employees will not take affirmative action of their own.

DECONTAMINATION PROCEDURES

The risks of illness due to ingestion of diseased or decomposing materials from the work site are significant. To minimize these risks, all personnel should remove and store the outer layer of their protective clothing (i.e., coveralls, gloves, etc.) on-site. Hands, face, and nails should be thoroughly washed, or scrubbed, with soap and water prior to engaging in activity likely to transmit materials encountered on-site into the mouth. If waste materials come in contact with the skin, that crew member will be temporarily excused to thoroughly wash the affected area with soap and water.

HANDLING OF HAZARDOUS WASTE MATERIALS

Hazardous materials will be avoided during sample selection. If hazardous materials are encountered during waste sorting activities it will be reported to the SCS Field Manager immediately. The materials will be separated from the MSW and recyclable material streams and put in a separate container. The hazardous materials will be reported to the Client Representative and that individual will be responsible for disposing of the materials.

Caution will be taken when handling mercury-containing wastes such as fluorescent light bulbs. Care will be taken to not break the glass bulb, and to avoid samples with excess amounts of fluorescent light bulbs.

HOUSEKEEPING REQUIREMENTS

SCS expects clients to provide access to a washroom/restroom with toilets, running water, and soap to facilitate decontamination. Hand sanitizer will also be made available in the designated break area. SCS field staff and subcontractors will keep our work area clutter-free and organized throughout the field activities to facilitate a safe working environment. Equipment and supplies will not be left on the ground/floor.

5 SITE HAZARDS

Chemical and Physical Agent Hazards

The following chemical and physical hazards should be considered before performing work at the Public Works Yard. The analysis will depend on a thorough understanding of the site's physical characteristics and the task(s) being performed.

Toxic Compounds: Non-Methane Organic Compounds (NMOCs), as well as inorganic toxic contaminants such as mercury, and sometimes even radioactive contaminants such as tritium, may be present. NMOCs include such toxic compounds as benzene, toluene, chloroform, vinyl chloride, carbon tetrachloride, and trichloroethane, which are commonly less than one percent by weight. These potential hazards should be evaluated on a case-by-case basis.

Poisons: Pesticides, cleaners, or other toxic materials of various types may be present in the waste stream. Avoid contact with these items. Pay close attention to where you walk and what you touch such that materials do not accidentally come into contact with skin, eyes, mouth, or clothing. Immediately remove any contaminated clothing, and wash with soapy water any skin that becomes contaminated.

Flammables: Fuel such as gasoline and diesel may be present in the waste stream. Additionally, paint thinners or other flammable materials may be present in the waste. The primary risk associated with these materials is fire. Keep all ignition sources away from flammable materials. Do not smoke, unless in designated areas. Pay close attention to where you walk and what you touch such that materials do not accidentally come into contact with skin, eyes, mouth, or clothing. Immediately remove contaminated clothing, and wash with soapy water any skin that becomes contaminated.

Oxidizers: Fertilizers, pool chemicals, chlorine, or other oxidizers may be present in the waste stream. The primary risk from oxidizers is an increased fire potential. Keep fire and fuel or oil away from oxidizers. Do not smoke, unless in designated areas. Pay close attention to where you walk and what you touch such that materials do not accidentally come into contact with skin, eyes, mouth, or clothing. Immediately remove contaminated clothing, and wash with soapy water skin that becomes contaminated.

Corrosives: Acidic and caustic materials may be present in the waste stream. The primary risk from corrosives is damage to the skin or eyes. Pay close attention to where you walk and what you touch such that materials do not accidentally come into contact with skin, eyes, mouth, or clothing. Immediately remove contaminated clothing, and wash with soapy water skin that becomes contaminated.

Physical Hazards

Physical hazards are inherently present during project field activities. Common physical hazards include mechanical hazards; noise exposure associated with mechanical equipment use; slip-trip-fall hazards associated with the field environment; hazards associated with weather conditions; musculoskeletal injury resulting from lifting tasks; and biological hazards. The physical hazards anticipated at the work site and the methods for preventing injury due to these hazards are

described below. The following physical hazards should be considered before performing any task or work. Depending on the task(s) performed, any or all of these hazards may be present.

- **Slip-Trip-Fall Hazards and General Housekeeping:** Slip-trip-fall hazards are common at most solid waste facilities due to wet, muddy, slippery or unstable surfaces and/or equipment on the ground. While it is difficult to eliminate all slip-trip-fall hazards, implementing safe work practices, utilizing proper footwear, and keeping the work area free from obstructions will minimize risk of injury. All tools, materials and supplies will have designated storage areas so that they do not become tripping hazards.

- **Noise:** Noise hazards may exist from equipment and collection vehicles. Noise levels identified as exceeding 85 decibels (i.e., whenever you have to raise your voice above normal conversational speech to be heard) will be reduced by means of hearing protection.

- **Lifting Hazards:** Field operations often require the performance of physical tasks, including lifting heavy items. All employees must implement proper lifting procedures, such as keeping the load close to the body and using leg muscles instead of back muscles to perform lifting tasks. Additionally, employees shall not attempt to lift large, heavy or awkwardly shaped objects without assistance.

- **Lightning and Other Severe Weather Events:** The danger of lightning strike is increased when work occurs on the elevated surface. Lightning can strike miles ahead of a storm when no rain is present. All operations should be stopped immediately when lightning is visible or thunder is audible. All personnel should seek shelter off the elevated surfaces and remain inside a building (primary) or vehicle (secondary) until the danger passes. Do not take shelter near tall objects such as power lines, trees, antennas, or the flare stack. Work can resume when the lightning is no longer visible and the thunder cannot be heard.

- **Heavy Equipment:** Compactors, bull dozers, loaders, track hoes, forklifts and large trucks, and other vehicles are present at the work site. Loud noise and limited visibility can increase the threat of being run over or crushed by these vehicles. Wear high-visibility vests (recommend Class III) and coordinate with vehicle operators when working in the vicinity of this equipment. Heavy equipment hazards are especially present at the designated waste sampling area(s). When working in these areas, equipment operators must be notified. .

- **Heat-Related Injuries:** Elevated body temperatures can cause serious injury or death. Working outdoors or in the sun increases the chance of heat-related injuries. This hazard is especially critical when PPE (such as coveralls or rain gear) is worn, since heat from the body becomes trapped inside clothing. Personnel should drink plenty of liquids and take breaks as needed. The following describes the various effects of heat-related injuries.

- **Heat Disorders and Health Effects**:

    - **Heat Stroke:** This disorder occurs when the body's system of temperature regulation (e.g., sweating and evaporation) fails and body temperature rises to critical levels. The condition is caused by a combination of highly variable factors, and its occurrence is difficult to predict. Heat stroke is a serious hazard, however. Primary signs and symptoms are confusion, irrational behavior, loss of consciousness, convulsions, a lack of sweating (usually), hot, dry skin, and an abnormally high body temperature. If a worker shows signs of possible heat stroke, call 911 to obtain immediate medical assistance. The worker should be placed in a shady area, and

his or her outer clothing should be removed. The worker's skin should also be wetted and air movement around the body increased to improve evaporative cooling until professional methods of cooling are initiated and the seriousness of the condition can be assessed. Fluids should be replaced as soon as possible--by mouth only if the worker is conscious. The medical outcome of an episode of heat stroke depends on the victim's physical fitness and the timing and effectiveness of first aid treatment. Regardless of the worker's protests, no employee suspected of being ill from heat stroke should be sent home or left unattended unless a physician has specifically approved such an order.

- **Heat Exhaustion:** The signs and symptoms of heat exhaustion include clammy skin, headache, nausea, vertigo, weakness, thirst, and giddiness. Fortunately, heat exhaustion responds readily to prompt treatment. This condition, however, should not be dismissed lightly, for several reasons. One is that fainting associated with heat exhaustion can be dangerous because the victim may be operating machinery or controlling an operation that should not be left unattended. The victim could also be injured when he or she faints. While the signs and symptoms associated with heat exhaustion are similar to those of heat stroke, the notable difference (with heat exhaustion) is clammy skin. Workers suffering from heat exhaustion should be removed from hot environments and given fluid replacement, by mouth only if the workers are conscious. They should also be encouraged to get adequate rest.

- **Heat Rashes:** The most common problem occurring in hot work environments is heat rash. Prickly heat is manifested as red papules and usually appears in areas where the clothing is restrictive. As sweating increases, the papules give rise to a prickling sensation. Prickly heat occurs in skin that is persistently wetted by unevaporated sweat, and papules may become infected if they are not treated. In most cases, heat rash will disappear when the affected individual returns to a cool environment.

- **Heat Fatigue:** One factor that predisposes individuals to heat fatigue is the lack of acclimatization. Use of a program of acclimatization and training for work in hot environments are advisable. The signs and symptoms of heat fatigue include impaired performance of skilled sensorimotor, high-concentration, or high-vigilance activities. The sole treatment available for heat fatigue is to remove heat stress and increase fluid replacement before a more serious heat-related condition develops.

Dust Hazards: High winds can result in airborne hazards. Be aware of dust hazards; if activities create dust or it is windy and metal contaminants are suspected, avoid breathing dust/particulates and avoid getting dirt on body/clothes. Stand upwind, use dust control in work area, and/or use dust cartridges on respirators as conditions warrant to avoid exposure. If dust is generated during operations, report to SCS Engineers Project Manager.

Biological Hazards

Rodents, poisonous insects, snakes, other animals and/or plants are a natural part of any ecosystem. They are sometimes difficult to eliminate or avoid on some sites because of the location. Employees should be aware of the potential for encountering these types of animals and plants. Where possible, nesting places should be removed or access to them should be limited. If several infestations occur, remedies should be discussed with a supervisor and the client (see **SCS IIPP, SOP-**

21, for precautions and treatment for biological hazards). The following could be encountered in carrying out this project's activities:

- **Rabid Animals:** Some mammals may carry rabies, and rabid animals tend to approach people instead of avoiding them. Beware of nocturnal (night dwelling) animals (such as raccoons or opossums) active during the day.

- **Dogs:** Realize that dogs encountered in the wild tend not to be "man's best friend," even if they look like "Lassie." Two or more dogs together constitute a pack (with a tendency toward fierce behavior), and can pose significant threat. Roaming animals, particularly large dogs that instinctively hunt by sight (such as collies or shepherds), are cause for concern. Some breeds (cocker spaniels and English Springer spaniels) are notorious for erratic fits of violent behavior. Other dogs are bred as guard dogs or fighting dogs (Dobermans, Rottweilers, Boxers, and Bulldogs). Dogs that are unconfined are more likely to contract rabies. Beware of dogs that foam at the mouth or show their teeth. Upon encountering such a dog, do not make any sudden moves. Do not make direct eye contact with the dog. Back slowly away from the animal, and never turn your back on unknown dogs.

- **Hantavirus:** Infection typically occurs by the inhalation of tiny airborne droplets of fresh or dried rodent excretions. Transmission to humans may also occur through direct contact with rodents or rodent-contaminated materials, and ingestion of contaminated food or water is also a possible route of transmission. Sweeping or "shaking out" rodent-contaminated materials should be avoided unless performed using respiratory protection. The early symptoms of hantavirus disease are flu-like (fever, chills, muscle aches). For a very short period of time, the infected person starts to feel better. Then, within 1 to 2 days, he or she may develop shortness of breath. The disease gets worse quickly and leads to respiratory failure, a condition known as Hantavirus Pulmonary Syndrome (HPS). About half of all HPS patients experience these symptoms, which usually occur 1 to 5 weeks from contracting the illness.

- **Snakes:** The potential exists to encounter snakes. The Copperhead and Timber Rattlesnake are potentially the most dangerous. Not all rattlesnakes give audible warning before they strike. Extra caution should be taken if tools or other materials are dropped in highly vegetated areas, around rocks, into stockpiles of pipe or other objects, or when walking through highly vegetated areas where visibility (of the ground) is limited. The most active times for rattlesnakes are morning, late afternoon, and early evening; however, encounters could happen at any time of the day. Walking loudly, shuffling feet, or making noise while working is recommended.

- **Bloodborne Pathogens:** Human blood can contain harmful viruses such as the Human Immunodeficiency Virus (HIV) and Hepatitis B Virus (HBV). Contact with affected blood, as well as materials contaminated by this blood, can result in transmitting viruses and the life-threatening conditions they cause.

SCS has adopted a Bloodborne Pathogen Exposure Control Plan to protect employees who may come into contact with blood, or materials contaminated with blood, during the performance of tasks. Although the program is intended to comply with OSHA's Bloodborne Pathogens Standard, 29 CFR 1910.1030, the primary purpose for adopting the plan is to help employees avoid bloodborne pathogens at work.

When an employee is involved in an exposure incident, it must be reported in accordance with the Health and Safety Injury and Illness Prevention Plan. All employees involved in an exposure incident will be offered post-exposure evaluation and follow-up, in accordance with the OSHA standard. Follow-up will include:

- Documentation of the route of exposure and the circumstances related to the incident.
- If possible, identification of the source individual and, if possible, the status of the source individual. The blood of the source individual will be tested (after consent is obtained) for HIV/HBV infectivity.
- Results of testing of the source individual will be made available to the exposed employee, along with applicable laws and regulations concerning disclosure of the identity and infectivity of the source individual.
- The employee will be offered the option of having blood collected for testing of that employee's HIV/HBV serological status. The blood sample will be preserved for at least 90 days to allow the employee to decide if the blood should be tested for HIV serological status. However, if the employee decides, prior to that time, that testing will be conducted, the appropriate action can be taken and the blood sample discarded.
- The employee will be offered post-exposure counseling in accordance with current recommendations of the U.S. Public Health Service.
- The employee will be given appropriate counseling concerning precautions to take during the period after the exposure incident. The employee will also be given information regarding potential illnesses and procedures for reporting related symptoms to appropriate personnel.

Attachment 1 – Job Task Safety Analysis and PPE Assessment Form

JTSA 16 – Waste Sort

Job Task Safety Analysis and PPE Assessment Form: JTSA-ES-16-WASTE SORT

Task Type (Check all that apply) ☐ **FS-OM&M/Construction** ☐ **Construction** ☐ **Energy** ☒ **Engineering**	**Task Description (include estimate of task duration in hours/day):** 5 Day waste sort; on-site for approximately 9 hours per day.	**Location or Project:** TDEC Statewide Waste Characterization Study **Date: November 17-21, 2025** **Project/Revision #:** 02224033.00	
Analysis Team Member	**Position Title**	**Acknowledged by**	**Position Title**
Brent Dieleman	Project/Field Manager		
Special Training/Certification Required (In Addition to IIPP and Site Specific Health & Safety Plan)	Bloodborne pathogens training		

Applicable SAFE Checklist(s): Specify type and category number	Safe Observation Form/Vehicle Inspection Form/Employee Suggestion

This form is certification that the hazard assessment has been performed for the workplace as required under 29 CFR 1910.132. This document is to be used as guidance for the task described and should be modified on an as necessary basis to address site, operational and/or environmental changes.

Job Task Safety Analysis and PPE Assessment Form: JTSA-ES-16-WASTE SORT

Job Task Step	Potential Environmental and Personnel Hazards[1]	Critical Actions	PPE Required
1. Drive to site, set up sorting table and containers.	Heavy lifting Slips/trips/falls Vehicle traffic	• Check in w/facility • Ensure work area is secured/isolated • Use buddy system • Employ safe lifting behaviors • Stretch/warm-up	Head: None Body: High-vis vest Foot: Steel--toe ANSI boots Hand: Nitrile/leather outer glove Respiratory: None Hearing: None Eye/Face: Safety glasses
2. Collect solid waste samples	Heavy lifting Vehicle/equipment traffic Slips/trips/falls Medical/bio waste Sharps Chemical exposures	• Stay visible • Use safe lifting • Set up away from traffic • Give directions to equipment operator • Avoid vehicle/equipment traffic	Head: Hardhat, if required by site Body: Safety vest Foot: Steel--toe ANSI boots Hand: Nitrile/puncture resistant gloves Respiratory: None Hearing: None Eye/Face: Safety glasses
3. Hand-sort solid waste materials on the sorting table	Heavy lifting Slips/trips/falls Medical/bio waste Sharps Chemical exposures Stress/hygiene concerns	• Use buddy system • Stay visible • Use safe lifting • Set up away from traffic • Brush trash (vs digging) • Wash hands freq. • Stay hydrated • Take breaks	Head: Hardhat, if required by site Body: Safety vest, Tyvek Foot: Steel--toe ANSI boots Hand: Nitrile/puncture resistant gloves Respiratory: Dust mask (optional) Hearing: None Eye/Face: Safety glasses
4. Cleanup and Decontaminate	Heavy lifting Slips/trips/falls Vehicle traffic	• Ensure work area is secured/isolated • Use buddy system • Employ safe lifting behaviors • Stretch/warm-up • Decontaminate PPE	Head: Hardhat, if required by site Body: Safety vest Foot: Steel--toe ANSI boots Hand: Nitrile/leather outer glove Respiratory: Dust mask (optional) Hearing: None Eye/Face: Safety glasses
5. Demobilization	Vehicle/HE traffic	• Check out w/facility	Head: None Body: High Visibility Vest Foot: Steel--toe ANSI boots Hand: None Respiratory: None Hearing: None Eye/Face: None
End of JTSA Form			

Appendix B

Detailed Residential Composition by Tennessee Grand Division

Residential MSW Composition Detailed – **West Tennessee**

Material Components	Mean Composition	Standard Deviation	95% Confidence Limits Lower	Upper
PAPER				
Sorted Office Paper	2.0%	1.6%	1.6%	2.3%
Newspaper and Magazines	1.2%	1.1%	0.9%	1.4%
Mixed Paper	1.6%	0.9%	1.4%	1.8%
Compostable Paper	6.2%	2.2%	5.8%	6.7%
Old Corrugated Cardboard	4.7%	2.5%	4.2%	5.3%
Paperboard	5.7%	1.7%	5.3%	6.0%
Other Paper (non-recyclable)	2.0%	1.6%	1.7%	2.4%
Total Paper	**23.4%**			
RIGID PLASTIC				
PET #1	3.3%	1.0%	3.1%	3.5%
HDPE #2	1.4%	0.6%	1.2%	1.5%
PVC #3	<0.1%	0.1%	<0.1%	<0.1%
LDPE #4	<0.1%	<0.1%	<0.1%	<0.1%
PP #5	1.2%	0.4%	1.1%	1.3%
PS #6	1.4%	0.6%	1.3%	1.6%
Durable Plastics	1.9%	1.6%	1.6%	2.3%
#7 and Other Rigid Plastics	1.0%	0.5%	0.8%	1.1%
Total Rigid Plastic	**10.2%**			
FILM PLASTIC				
Garbage Bags	3.1%	1.0%	2.8%	3.3%
Retail Bags	1.8%	0.5%	1.6%	1.9%
Other Film Plastics	3.7%	1.1%	3.4%	3.9%
Total Film Plastic	**8.5%**			
ORGANICS				
Wasted Food (Edible)	13.4%	6.4%	12.0%	14.7%
Wasted Food (Inedible)	3.2%	1.7%	2.9%	3.6%
Yard Waste	3.9%	8.2%	2.1%	5.6%
Wood (Non-C&D)	0.2%	0.5%	0.1%	0.3%
Textiles and Shoes	5.6%	3.8%	4.8%	6.4%
Other Organics	3.9%	5.4%	2.7%	5.0%
Total Organics	**30.2%**			

Residential MSW Composition Detailed – **West Tennessee (continued)**

Material Components	Mean Composition	Standard Deviation	95% Confidence Limits Lower	Upper
METALS				
Steel and Tin Cans	1.4%	0.7%	1.2%	1.5%
Aluminum Cans	1.6%	0.6%	1.4%	1.7%
Aerosol Cans	0.3%	0.3%	0.2%	0.3%
Other Ferrous Metal	1.1%	1.4%	0.8%	1.4%
Other Non-Ferrous Metal	0.9%	1.0%	0.7%	1.1%
Total Metals	**5.3%**			
GLASS				
Clear Glass	2.0%	1.3%	1.7%	2.3%
Green Glass	0.3%	0.5%	0.2%	0.4%
Amber Glass	0.5%	0.7%	0.4%	0.7%
Blue Glass	<0.1%	0.4%	<0.1%	0.1%
Other Glass	0.3%	1.0%	<0.1%	0.5%
Total Glass	**3.1%**			
C&D MATERIAL				
Drywall	0.3%	2.3%	<0.1%	0.8%
Wood	0.7%	1.6%	0.3%	1.1%
Carpet	0.3%	0.9%	<0.1%	0.4%
Other C&D Waste	1.2%	4.6%	0.2%	2.1%
Total C&D Material	**2.4%**			
HOUSEHOLD HAZARDOUS WASTE				
Batteries	<0.1%	0.1%	<0.1%	0.1%
Oil	<0.1%	0.1%	<0.1%	<0.1%
Paint	<0.1%	0.3%	<0.1%	0.1%
Anit-freeze	<0.1%	<0.1%	<0.1%	<0.1%
Other HHW	0.2%	0.4%	0.1%	0.3%
Total HHW	**0.3%**			
ELECTRONICS				
Electronics	0.8%	1.2%	0.5%	1.0%
Total Electronics	**0.8%**			
OTHER				
Tires	<0.1%	<0.1%	<0.1%	<0.1%
Other	10.0%	8.3%	8.3%	11.8%
Fines	5.7%	3.1%	5.0%	6.4%
Total Other	**15.7%**			
TOTALS	**100.0%**			

Note: Composition based on 83 samples.

Residential MSW Composition Detailed – **Middle Tennessee**

Material Components	Mean Composition	Standard Deviation	95% Confidence Limits Lower	Upper
PAPER				
Sorted Office Paper	2.5%	2.2%	1.9%	3.0%
Newspaper and Magazines	1.1%	0.9%	0.9%	1.3%
Mixed Paper	2.1%	1.3%	1.8%	2.4%
Compostable Paper	7.1%	2.8%	6.4%	7.8%
Old Corrugated Cardboard	4.7%	3.3%	3.9%	5.6%
Paperboard	4.9%	1.6%	4.5%	5.3%
Other Paper (non-recyclable)	1.9%	1.3%	1.6%	2.2%
Total Paper	**24.2%**			
RIGID PLASTIC				
PET #1	3.3%	1.0%	3.0%	3.5%
HDPE #2	1.2%	0.6%	1.1%	1.4%
PVC #3	<0.1%	<0.1%	<0.1%	<0.1%
LDPE #4	<0.1%	<0.1%	<0.1%	<0.1%
PP #5	1.7%	1.0%	1.5%	2.0%
PS #6	1.4%	0.6%	1.3%	1.6%
Durable Plastics	2.2%	2.1%	1.7%	2.8%
#7 and Other Rigid Plastics	0.9%	0.4%	0.8%	1.0%
Total Rigid Plastic	**10.8%**			
FILM PLASTIC				
Garbage Bags	2.9%	1.0%	2.7%	3.2%
Retail Bags	1.6%	0.6%	1.5%	1.8%
Other Film Plastics	4.4%	1.4%	4.1%	4.8%
Total Film Plastic	**9.0%**			
ORGANICS				
Wasted Food (Edible)	14.9%	6.9%	13.2%	16.7%
Wasted Food (Inedible)	3.5%	1.8%	3.0%	4.0%
Yard Waste	3.6%	5.5%	2.1%	5.0%
Wood (Non-C&D)	0.3%	1.0%	<0.1%	0.6%
Textiles and Shoes	5.2%	4.0%	4.2%	6.2%
Other Organics	4.7%	6.2%	3.1%	6.2%
Total Organics	**32.2%**			

Residential MSW Composition Detailed – **Middle Tennessee (continued)**

Material Components	Mean Composition	Standard Deviation	95% Confidence Limits Lower	Upper
METALS				
Steel and Tin Cans	1.2%	0.6%	1.1%	1.4%
Aluminum Cans	1.5%	0.6%	1.3%	1.6%
Aerosol Cans	0.2%	0.2%	0.1%	0.2%
Other Ferrous Metal	1.3%	2.7%	0.6%	2.0%
Other Non-Ferrous Metal	0.7%	0.8%	0.5%	0.9%
Total Metals	**4.9%**			
GLASS				
Clear Glass	2.0%	1.5%	1.7%	2.4%
Green Glass	0.4%	0.6%	0.2%	0.5%
Amber Glass	0.4%	0.5%	0.3%	0.6%
Blue Glass	<0.1%	0.2%	<0.1%	<0.1%
Other Glass	0.3%	0.6%	0.1%	0.4%
Total Glass	**3.2%**			
C&D MATERIAL				
Drywall	0.2%	1.7%	<0.1%	0.7%
Wood	0.6%	0.9%	0.3%	0.8%
Carpet	0.9%	2.7%	0.2%	1.6%
Other C&D Waste	0.2%	0.8%	<0.1%	0.4%
Total C&D Material	**2.0%**			
HOUSEHOLD HAZARDOUS WASTE				
Batteries	0.3%	1.8%	<0.1%	0.8%
Oil	<0.1%	<0.1%	<0.1%	<0.1%
Paint	<0.1%	<0.1%	<0.1%	<0.1%
Anit-freeze	<0.1%	0.1%	<0.1%	<0.1%
Other HHW	0.2%	0.7%	<0.1%	0.4%
Total HHW	**0.6%**			
ELECTRONICS				
Electronics	1.1%	3.2%	0.3%	2.0%
Total Electronics	**1.1%**			
OTHER				
Tires	<0.1%	0.2%	<0.1%	<0.1%
Other	6.8%	4.3%	5.7%	7.9%
Fines	5.2%	5.7%	3.7%	6.6%
Total Other	**12.0%**			
TOTALS	**100.0%**			

Note: Composition based on 59 samples.

Residential MSW Composition Detailed – **East Tennessee**

Material Components	Mean Composition	Standard Deviation	95% Confidence Limi Lower	Upper
PAPER				
Sorted Office Paper	2.6%	1.8%	2.2%	3.0%
Newspaper and Magazines	0.8%	0.9%	0.5%	1.0%
Mixed Paper	2.6%	1.4%	2.2%	2.9%
Compostable Paper	6.6%	1.8%	6.2%	7.0%
Old Corrugated Cardboard	4.2%	2.1%	3.7%	4.7%
Paperboard	5.3%	1.6%	4.9%	5.6%
Other Paper (non-recyclable)	2.3%	1.0%	2.1%	2.6%
Total Paper	**24.4%**			
RIGID PLASTIC				
PET #1	3.6%	1.0%	3.4%	3.9%
HDPE #2	1.3%	0.5%	1.2%	1.4%
PVC #3	<0.1%	<0.1%	<0.1%	<0.1%
LDPE #4	<0.1%	<0.1%	<0.1%	<0.1%
PP #5	1.7%	0.5%	1.6%	1.8%
PS #6	1.2%	0.4%	1.1%	1.3%
Durable Plastics	1.5%	1.7%	1.1%	1.9%
#7 and Other Rigid Plastics	1.3%	0.5%	1.2%	1.4%
Total Rigid Plastic	**10.7%**			
FILM PLASTIC				
Garbage Bags	2.5%	0.7%	2.4%	2.7%
Retail Bags	1.4%	0.6%	1.3%	1.5%
Other Film Plastics	3.8%	0.8%	3.6%	4.0%
Total Film Plastic	**7.8%**			
ORGANICS				
Wasted Food (Edible)	15.5%	5.2%	14.4%	16.7%
Wasted Food (Inedible)	6.7%	2.9%	6.1%	7.4%
Yard Waste	0.8%	1.7%	0.4%	1.2%
Wood (Non-C&D)	0.2%	0.7%	<0.1%	0.4%
Textiles and Shoes	4.1%	3.1%	3.4%	4.8%
Other Organics	3.6%	4.6%	2.6%	4.7%
Total Organics	**31.0%**			

Residential MSW Composition Detailed – **East Tennessee (continued)**

Material Components	Mean Composition	Standard Deviation	95% Confidence Limits Lower	Upper
METALS				
Steel and Tin Cans	1.7%	0.8%	1.5%	1.9%
Aluminum Cans	1.6%	0.7%	1.5%	1.8%
Aerosol Cans	0.3%	0.2%	0.2%	0.3%
Other Ferrous Metal	0.9%	1.2%	0.6%	1.2%
Other Non-Ferrous Metal	0.8%	1.2%	0.5%	1.1%
Total Metals	**5.3%**			
GLASS				
Clear Glass	2.6%	1.7%	2.3%	3.0%
Green Glass	0.8%	1.0%	0.6%	1.1%
Amber Glass	0.7%	0.7%	0.5%	0.8%
Blue Glass	<0.1%	0.1%	<0.1%	<0.1%
Other Glass	0.3%	0.9%	0.1%	0.5%
Total Glass	**4.5%**			
C&D MATERIAL				
Drywall	<0.1%	0.4%	<0.1%	0.2%
Wood	0.6%	1.1%	0.3%	0.8%
Carpet	0.3%	1.0%	<0.1%	0.5%
Other C&D Waste	0.3%	0.7%	0.2%	0.5%
Total C&D Material	**1.2%**			
HOUSEHOLD HAZARDOUS WASTE				
Batteries	<0.1%	0.2%	<0.1%	0.1%
Oil	<0.1%	0.1%	<0.1%	<0.1%
Paint	0.2%	0.8%	<0.1%	0.4%
Anit-freeze	<0.1%	<0.1%	<0.1%	<0.1%
Other HHW	0.3%	1.1%	<0.1%	0.6%
Total HHW	**0.7%**			
ELECTRONICS				
Electronics	1.1%	2.3%	0.6%	1.6%
Total Electronics	**1.1%**			
OTHER				
Tires	<0.1%	0.1%	<0.1%	<0.1%
Other	9.0%	4.8%	7.9%	10.1%
Fines	4.4%	2.7%	3.8%	5.1%
Total Other	**13.4%**			
TOTALS	**100.0%**			

Note: Composition based on 75 samples.

Appendix C

Detailed Commercial Composition by Tennessee Grand Division

Commercial MSW Composition Detailed – **West Tennessee**

Material Components	Mean Composition	Standard Deviation	95% Confidence Limits Lower	Upper
PAPER				
Sorted Office Paper	1.7%	2.0%	1.2%	2.2%
Newspaper and Magazines	0.7%	1.3%	0.4%	1.0%
Mixed Paper	2.2%	1.8%	1.8%	2.7%
Compostable Paper	6.4%	3.6%	5.5%	7.2%
Old Corrugated Cardboard	12.9%	11.1%	10.2%	15.6%
Paperboard	3.0%	1.9%	2.6%	3.5%
Other Paper (non-recyclable)	1.7%	1.6%	1.3%	2.1%
Total Paper	**28.6%**			
RIGID PLASTIC				
PET #1	1.9%	1.2%	1.6%	2.2%
HDPE #2	0.9%	0.7%	0.8%	1.1%
PVC #3	<0.1%	0.2%	<0.1%	<0.1%
LDPE #4	<0.1%	<0.1%	<0.1%	<0.1%
PP #5	1.3%	1.0%	1.1%	1.6%
PS #6	1.3%	0.9%	1.1%	1.5%
Durable Plastics	1.4%	1.6%	1.0%	1.8%
#7 and Other Rigid Plastics	0.9%	0.6%	0.7%	1.0%
Total Rigid Plastic	**7.9%**			
FILM PLASTIC				
Garbage Bags	4.1%	2.0%	3.6%	4.6%
Retail Bags	0.9%	0.5%	0.8%	1.1%
Other Film Plastics	4.7%	2.6%	4.1%	5.3%
Total Film Plastic	**9.7%**			
ORGANICS				
Wasted Food (Edible)	18.5%	13.2%	15.4%	21.7%
Wasted Food (Inedible)	4.6%	6.2%	3.1%	6.1%
Yard Waste	2.7%	10.0%	0.4%	5.1%
Wood (Non-C&D)	0.5%	1.4%	0.2%	0.8%
Textiles and Shoes	5.7%	16.1%	1.9%	9.6%
Other Organics	1.8%	4.3%	0.8%	2.8%
Total Organics	**33.9%**			

Commercial MSW Composition Detailed – **West Tennessee (continued)**

Material Components	Mean Composition	Standard Deviation	95% Confidence Limits Lower	Upper
METALS				
Steel and Tin Cans	1.1%	1.6%	0.7%	1.4%
Aluminum Cans	0.9%	0.7%	0.7%	1.1%
Aerosol Cans	0.1%	0.2%	<0.1%	0.2%
Other Ferrous Metal	1.9%	4.2%	0.9%	2.9%
Other Non-Ferrous Metal	0.9%	1.3%	0.6%	1.2%
Total Metals	**4.9%**			
GLASS				
Clear Glass	0.8%	0.9%	0.6%	1.0%
Green Glass	<0.1%	0.2%	<0.1%	<0.1%
Amber Glass	0.6%	1.3%	0.3%	0.9%
Blue Glass	<0.1%	<0.1%	<0.1%	<0.1%
Other Glass	0.2%	1.4%	<0.1%	0.6%
Total Glass	**1.7%**			
C&D MATERIAL				
Drywall	<0.1%	0.5%	<0.1%	0.2%
Wood	1.6%	4.3%	0.6%	2.6%
Carpet	0.6%	2.6%	<0.1%	1.2%
Other C&D Waste	0.7%	2.7%	<0.1%	1.3%
Total C&D Material	**3.0%**			
HOUSEHOLD HAZARDOUS WASTE				
Batteries	<0.1%	<0.1%	<0.1%	<0.1%
Oil	<0.1%	0.1%	<0.1%	<0.1%
Paint	<0.1%	0.2%	<0.1%	<0.1%
Anit-freeze	<0.1%	<0.1%	<0.1%	<0.1%
Other HHW	0.2%	0.6%	<0.1%	0.3%
Total HHW	**0.3%**			
ELECTRONICS				
Electronics	0.6%	1.7%	0.1%	1.0%
Total Electronics	**0.6%**			
OTHER				
Tires	0.2%	1.1%	<0.1%	0.4%
Other	5.7%	8.3%	3.7%	7.7%
Fines	3.6%	3.5%	2.7%	4.4%
Total Other	**9.4%**			
TOTALS	**100.0%**			

Note: Composition based on 67 samples.

Commercial MSW Composition Detailed – **Middle Tennessee**

Material Components	Mean Composition	Standard Deviation	95% Confidence Limits Lower	Upper
PAPER				
Sorted Office Paper	0.9%	0.8%	0.7%	1.2%
Newspaper and Magazines	0.5%	0.6%	0.3%	0.6%
Mixed Paper	1.8%	1.3%	1.4%	2.2%
Compostable Paper	6.3%	3.3%	5.3%	7.3%
Old Corrugated Cardboard	11.4%	9.5%	8.5%	14.4%
Paperboard	2.9%	1.4%	2.5%	3.3%
Other Paper (non-recyclable)	1.6%	1.7%	1.1%	2.1%
Total Paper	**25.4%**			
RIGID PLASTIC				
PET #1	2.0%	1.2%	1.7%	2.4%
HDPE #2	0.9%	0.7%	0.7%	1.1%
PVC #3	<0.1%	0.5%	<0.1%	0.3%
LDPE #4	<0.1%	<0.1%	<0.1%	<0.1%
PP #5	1.1%	0.6%	0.9%	1.3%
PS #6	1.3%	1.2%	0.9%	1.6%
Durable Plastics	3.6%	4.7%	2.2%	5.1%
#7 and Other Rigid Plastics	1.0%	0.9%	0.7%	1.3%
Total Rigid Plastic	**10.0%**			
FILM PLASTIC				
Garbage Bags	2.9%	2.0%	2.3%	3.5%
Retail Bags	1.0%	0.6%	0.9%	1.2%
Other Film Plastics	5.6%	3.4%	4.5%	6.6%
Total Film Plastic	**9.5%**			
ORGANICS				
Wasted Food (Edible)	13.9%	7.4%	11.6%	16.1%
Wasted Food (Inedible)	4.7%	4.7%	3.2%	6.1%
Yard Waste	0.8%	2.5%	<0.1%	1.6%
Wood (Non-C&D)	1.0%	3.0%	<0.1%	1.9%
Textiles and Shoes	6.7%	6.2%	4.8%	8.5%
Other Organics	3.7%	11.2%	0.3%	7.1%
Total Organics	**30.8%**			

Commercial MSW Composition Detailed – **Middle Tennessee (continued)**

Material Components	Mean Composition	Standard Deviation	95% Confidence Limits Lower	Upper
METALS				
Steel and Tin Cans	0.8%	0.7%	0.5%	1.0%
Aluminum Cans	0.9%	0.6%	0.7%	1.1%
Aerosol Cans	0.2%	0.4%	<0.1%	0.3%
Other Ferrous Metal	2.0%	3.1%	1.1%	3.0%
Other Non-Ferrous Metal	1.1%	2.0%	0.4%	1.7%
Total Metals	**5.0%**			
GLASS				
Clear Glass	1.9%	2.1%	1.3%	2.6%
Green Glass	0.2%	0.5%	<0.1%	0.4%
Amber Glass	0.4%	0.5%	0.2%	0.5%
Blue Glass	<0.1%	<0.1%	<0.1%	<0.1%
Other Glass	0.4%	1.2%	<0.1%	0.8%
Total Glass	**2.9%**			
C&D MATERIAL				
Drywall	<0.1%	0.1%	<0.1%	<0.1%
Wood	2.2%	4.0%	1.0%	3.5%
Carpet	0.7%	3.1%	<0.1%	1.7%
Other C&D Waste	1.7%	4.1%	0.5%	3.0%
Total C&D Material	**4.7%**			
HOUSEHOLD HAZARDOUS WASTE				
Batteries	<0.1%	<0.1%	<0.1%	<0.1%
Oil	0.3%	1.6%	<0.1%	0.8%
Paint	0.4%	1.9%	<0.1%	1.0%
Anit-freeze	<0.1%	<0.1%	<0.1%	<0.1%
Other HHW	0.2%	0.7%	<0.1%	0.4%
Total HHW	**1.0%**			
ELECTRONICS				
Electronics	0.7%	1.4%	0.3%	1.1%
Total Electronics	**0.7%**			
OTHER				
Tires	2.9%	10.0%	<0.1%	5.9%
Other	4.4%	4.8%	2.9%	5.9%
Fines	2.8%	2.7%	1.9%	3.6%
Total Other	**10.0%**			
TOTALS	**100.0%**			

Note: Composition based on 41 samples.

Commercial MSW Composition Detailed – **East Tennessee**

Material Components	Mean Composition	Standard Deviation	95% Confidence Limits Lower	Upper
PAPER				
Sorted Office Paper	2.1%	2.4%	1.6%	2.7%
Newspaper and Magazines	0.5%	1.2%	0.3%	0.8%
Mixed Paper	3.2%	4.0%	2.2%	4.2%
Compostable Paper	6.0%	3.4%	5.2%	6.8%
Old Corrugated Cardboard	7.7%	5.7%	6.3%	9.1%
Paperboard	3.4%	1.8%	3.0%	3.9%
Other Paper (non-recyclable)	4.1%	10.9%	1.4%	6.7%
Total Paper	**27.1%**			
RIGID PLASTIC				
PET #1	2.7%	1.5%	2.3%	3.0%
HDPE #2	1.3%	1.1%	1.0%	1.6%
PVC #3	<0.1%	0.1%	<0.1%	<0.1%
LDPE #4	<0.1%	0.2%	<0.1%	<0.1%
PP #5	1.5%	0.9%	1.2%	1.7%
PS #6	1.7%	2.0%	1.2%	2.2%
Durable Plastics	1.5%	1.3%	1.1%	1.8%
#7 and Other Rigid Plastics	1.1%	0.9%	0.8%	1.3%
Total Rigid Plastic	**9.7%**			
FILM PLASTIC				
Garbage Bags	4.2%	2.3%	3.6%	4.7%
Retail Bags	1.0%	0.6%	0.8%	1.1%
Other Film Plastics	5.6%	5.6%	4.2%	7.0%
Total Film Plastic	**10.7%**			
ORGANICS				
Wasted Food (Edible)	14.4%	9.1%	12.2%	16.6%
Wasted Food (Inedible)	5.4%	6.4%	3.9%	7.0%
Yard Waste	0.7%	2.3%	0.1%	1.2%
Wood (Non-C&D)	0.1%	0.4%	<0.1%	0.2%
Textiles and Shoes	4.4%	6.2%	2.9%	5.9%
Other Organics	1.5%	3.1%	0.7%	2.2%
Total Organics	**26.5%**			

Commercial MSW Composition Detailed – **East Tennessee (continued)**

Material Components	Mean Composition	Standard Deviation	95% Confidence Limits Lower	Upper
METALS				
Steel and Tin Cans	0.9%	1.0%	0.7%	1.2%
Aluminum Cans	1.1%	0.7%	1.0%	1.3%
Aerosol Cans	0.2%	0.3%	0.1%	0.3%
Other Ferrous Metal	1.4%	3.4%	0.6%	2.3%
Other Non-Ferrous Metal	0.5%	0.7%	0.3%	0.7%
Total Metals	**4.2%**			
GLASS				
Clear Glass	1.5%	1.3%	1.2%	1.8%
Green Glass	0.5%	0.8%	0.3%	0.7%
Amber Glass	0.7%	1.9%	0.2%	1.2%
Blue Glass	<0.1%	<0.1%	<0.1%	<0.1%
Other Glass	0.2%	0.5%	<0.1%	0.4%
Total Glass	**2.9%**			
C&D MATERIAL				
Drywall	1.1%	6.5%	<0.1%	2.6%
Wood	2.1%	4.8%	1.0%	3.3%
Carpet	0.8%	3.4%	<0.1%	1.7%
Other C&D Waste	1.8%	5.2%	0.5%	3.0%
Total C&D Material	**5.8%**			
HOUSEHOLD HAZARDOUS WASTE				
Batteries	<0.1%	<0.1%	<0.1%	<0.1%
Oil	<0.1%	<0.1%	<0.1%	<0.1%
Paint	<0.1%	0.4%	<0.1%	0.2%
Anit-freeze	<0.1%	0.5%	<0.1%	0.2%
Other HHW	1.5%	5.1%	0.2%	2.7%
Total HHW	**1.6%**			
ELECTRONICS				
Electronics	0.7%	1.5%	0.4%	1.1%
Total Electronics	**0.7%**			
OTHER				
Tires	0.3%	1.5%	<0.1%	0.6%
Other	6.3%	5.8%	4.9%	7.7%
Fines	4.1%	2.3%	3.6%	4.7%
Total Other	**10.7%**			
TOTALS	**100.0%**			

Note: Composition based on 65 samples.

Appendix D

EPA Volume-to-Weight Conversion Factors

Volume-to-Weight Conversion Factors
U.S. Environmental Protection Agency
Office of Resource Conservation and Recovery
April 2016

EPA's 1997 report, "Measuring Recycling: A Guide for State and Local Governments", was a guide to facilitate standardization of MSW data collection at the local level, which included volume-to-weight conversion factors for comparing recovery efforts between municipalities, regions and states. The factors are also valuable when planners work with the national recovery data presented in EPA's sustainable materials management report series.

This document provides updates to the volume-to-weight conversion factors found in the 1997 report Appendix B.

The goal of this update is to identify more current secondary data measurements of the various products. Of particular interest are products known to have been source reduced through light weighting since the early nineties such as plastic, glass and metal packaging. Some factors included on the original table are excluded from the revised table due to lack of updated data. Primary data collection was not performed.

The original Appendix B table included 12 materials categories; the updated table provides factors for 15 material categories, including the following.

- Appliances
- Automotive
- Carpeting
- Commingled Recyclables
- Electronics
- Food
- Glass
- Metals
- Municipal Solid Waste
- Paper
- Plastic
- Textiles
- Wood
- Yard Trimmings
- Construction & Demolition Debris (C&D)

All of the categories include multiple products and/or density measurements. Four product categories—carpeting, commingled recyclable material, electronics and construction and demolition debris—are new. Previously lead-acid batteries and scrap tires were separate categories but are combined into the single category "Automotive" in the updated table.

Other differences include the removal/addition of products within some of the categories to better reflect the current recycling industry. For example, eliminating "Tab Card" and adding "Mixed Paper" to the paper category reflects the move toward commingled recyclables collection. The addition of "Electronics" reflects the growth in these products since the original table was published.

The updated factors are shown in the table below.

Standard Volume-to-Weight Conversion Factors

Category	Recyclable Materials	Volume	Estimated Weight (lbs)	Source
Appliances	Major Appliances			
	Dishwasher	1 unit	125	1
	Clothes Dryer	1 unit	125	1
	Stove	1 unit	150	1
	Refrigerator	1 unit	250	1
	Clothes Washer	1 unit	150	1
Automotive	Lead-Acid Battery			
	Auto	one	36	3
	Truck	one	47	3
	Scrap Tire			
	Light Duty Tires (passenger, light truck)	one	22.5	5
	Commercial Tires	one	120	5
	Fluids			
	Used Motor Oil	gallon	7.4	2
	Antifreeze	gallon	8.42	2
	Other Automotive			
	Oil Filters not crushed	drum	175	1
	Oil Filters crushed	drum	700	1
	Oil Filters	gallon	5	1
Carpeting	Carpet			
	Carpet	cubic yard	147	6
	Carpet Padding	cubic yard	62	6
Commingled Recyclable Material	Containers (Plastic bottles, Aluminum cans, Steel cans, Glass bottles) and Paper			
	Commingled Recyclables	cubic yard	262	4
	Containers (Plastic bottles, Aluminum cans, Steel cans, Glass bottles), Corrugated Containers and Paper			
	Campus Recyclables	cubic yard	92	7
	Commingled Recyclables	cubic yard	111	4
	Containers (Plastic bottles, Aluminum cans, Steel cans, Glass bottles) – No paper			
	Campus Recyclables	cubic yard	70	7
	Commingled Recyclables	cubic yard	67	4
	Commercial Recyclables	cubic yard	113	8
	Containers (Cans, Plastic) - No glass			
	Campus Recyclables	cubic yard	32	7
	Containers (Cans, Plastic) and Paper - No glass			
	Residential Recyclables	cubic yard	260	2
	Containers (Food/beverage, Glass) Corrugated Containers and Paper			
	Commercial Recyclables	cubic yard	88	2
	Commercial Recyclables	cubic yard	58	21
	Multifamily Recyclables	cubic yard	96	2
	Multifamily Recyclables	cubic yard	51	21

Category	Recyclable Materials	Volume	Estimated Weight (lbs)	Source
Commingled Recyclable Material	*Single family Recyclables*	cubic yard	126	2
	Containers (Food/beverage, Glass) Corrugated Containers and Paper- No glass			
	Campus Recyclables	cubic yard	139	2
	Commercial Recyclables	cubic yard	155	2
Electronics	Computer Equipment			
	Desktop	one	27	24
	Laptop	one	9.8	24
	Monitor			
	CRT	one	40	1
	15"	one	30	2
	17"	one	45	2
	21"	one	60	2
	Flat Panel	one	24	1
	Mixed Monitors	one	29.4	24
	Televisions			
	CRT < 19 inch	one	41	1
	CRT ≥ 19 inch	one	73	1
	Flat Panel	one	29	1
	Mixed TVs	one	67.3	24
	Peripheral Devices			
	Printers	one	16.1	24
	Mice	one	0.2	9
	Keyboards	one	2.9	9
	Mobile Devices			
	Cellular Phone	one	0.22	9
	Mixed Electronics			
	Brown Goods	cubic yard	343	6
	Computer-related Electronics	cubic yard	354	6
	Other Small Consumer Electronics	cubic yard	438	6
Food				
	Fats, Oils, Grease	55-gallon	412	2
	Organics - commercial	cubic yard	135	21
	Source Separated Organics - commercial	cubic yard	1,000	15
	Food Waste - restaurants	cubic yard	396	21
	Food Waste	cubic yard	463	4
	Food Waste	cubic foot	22-45	4
	Food waste - university	gallon	3.8	22
	Food Waste	64 gallon toter	150	4
	Food waste	2 cubic yard full towable	2,736	4
Glass	Bottles			
	Loose	cubic yard	380	4

Category	Recyclable Materials	Volume	Estimated Weight (lbs)	Source
Metals	Aluminum Cans			
	Uncompacted	cubic yard	46	4
	Uncompacted	case = 24 cans	0.7	11
	Baled	cubic yard	250-500	10
	Steel Cans			
	Whole	cubic yard	50-175	10
	Baled	cubic yard	700-1,000	10
	Steel Cans - Institution			
	Whole	can	0.09	7
	Whole	cubic yard	136	7
Paper	Newsprint			
	Loose	cubic yard	360-800	1
	Baled	cubic yard	750-1,000	10
	Books - paperback, loose	cubic yard	428	23
	Old Corrugated Containers			
	Flattened	cubic yard	106	4
	Baled	cubic yard	700-1,100	10
	Old Corrugated Containers and Chip Board			
	Uncompacted	cubic yard	74.54	4
	Office Paper			
	Computer Paper			
	Loose	cubic yard	375-465	1
	Compacted/Baled	cubic yard	755-925	1
	Mixed			
	Loose	cubic yard	110-380	1
	Loose	cubic yard	323	4
	Compacted	cubic yard	610-755	1
	Shredded	cubic yard	128	4
	Mixed Baled	cubic yard	1,000-1,200	10
	Miscellaneous			
	Cartons (milk and juice) uncrushed	cubic yard	50	7
Plastic	PET			
	PET Bottles - baled	30"x42"x 48"	525-630	12
	PET Thermoform - baled	30"x42"x 48"	525-595	12
	HDPE			
	HDPE Dairy - baled	30"x42"x 48"	525-700	12
	HDPE Mixed - baled	30"x42"x 48"	525-700	12
	Mixed PET and HDPE			
	Loose	cubic yard	32	7
	Mixed Bottles/Containers #1 - #7			
	Loose	cubic yard	40.4	4
	Mixed Bottles/Containers #3 - #7			

Category	Recyclable Materials	Volume	Estimated Weight (lbs)	Source
Plastic	*Loose*	cubic yard	25.7	4
	Film			
	LDPE, loose	cubic yard	35	13
	LDPE, compacted	cubic yard	150	13
	LDPE, baled	30" x 42" x 48"	1,100	13
	Miscellaneous			
	Trash Bags	cubic yard	35	6
	Grocery/Merchandise Bags	cubic yard	35	6
	Expanded Polystyrene Packaging/Insulation	cubic yard	32	6
Textiles	Mixed Textiles			
	Loose	cubic yard	125-175	10
	Baled	cubic yard	600-750	10
Wood	Wood			
	Wood Chips, green	cubic yard	473	1
	Wood Chips, dry	cubic yard	243	1
	Saw Dust, wet	cubic yard	530	1
	Saw Dust, dry	cubic yard	275	1
	Pallets	one	25	1
	Pallets and Crates	cubic yard	169	18
	Christmas Trees, loose	cubic yard	30	1
Yard Trimmings	Yard Trimmings			
	Leaves	cubic yard	250-500	1
	Leaves (Minnesota)	cubic yard	300 - 383	15
	Mixed Yard Waste			
	Uncompacted	cubic yard	250	1
	Compacted	cubic yard	640	1
	Prunings & Trimmings	cubic yard	127	6
	Branches & Stumps	cubic yard	127	6
Municipal Solid Waste	MSW - Commercial			
	Commercial - dry waste	cubic yard	56-73	16, 8
	Commercial - all waste, uncompacted	cubic yard	138	21
	Mixed MSW - Residential, Institutional, Commercial			
	Uncompacted	cubic yard	250-300	14
	Compacted	cubic yard	400-700	14
	Mixed MSW - Multifamily uncompacted	cubic yard	95	21
	MSW - Landfill			
	Compacted - MSW Small Landfill with Best Management Practices	cubic yard	1,200-1,700	17
	Compacted - MSW Large Landfill with Best Management Practices	cubic yard	1,700-2,000	17

Category	Recyclable Materials	Volume	Estimated Weight (lbs)	Source
Municipal Solid Waste	*Compacted - MSW Very Large Landfill with Best Management and Cover Practices, Combined MMSW/Industrial/and other solid waste, or/and Leachate Recirculation*	cubic yard	>2,000	17
C &D	Concrete			
	Large Concrete with Re-bar	cubic yard	860	18
	Large Concrete without Re-bar	cubic yard	860	18
	Small Concrete with Re-bar	cubic yard	860	18
	Small Concrete without Re-bar	cubic yard	860	18
	Asphalt Paving			
	Large Asphalt Paving with Re-bar	cubic yard	773	19
	Large Asphalt Paving without Re-bar	cubic yard	773	19
	Small Asphalt Paving with Re-bar	cubic yard	773	19
	Small Asphalt Paving without Re-Bar	cubic yard	773	19
	Roofing			
	Composition Roofing	cubic yard	731	18
	Other Asphalt Roofing	cubic yard	731	18
	Other Aggregates	cubic yard	860	18
	Wood			
	Clean Dimensional Lumber	cubic yard	169	18
	Clean Engineered Wood	cubic yard	268	18
	Other Recyclable Wood	cubic yard	169	18
	Painted/Stained Wood	cubic yard	169	18
	Treated Wood	cubic yard	169	18
	Gypsum Board			
	Clean Gypsum Board	cubic yard	467	18
	Painted/Demolition Gypsum	cubic yard	467	18
	Aggregate			
	Large Rock	cubic yard	999	18
	Small Rock/Gravel	cubic yard	999	18
	Dirt and Sand	cubic yard	929	18
	Remainder/Composite Construction and Demolition	cubic yard	417	18
	Construction & Demolition Bulk	cubic yard	484	20
	Metal			
	Major Appliances	cubic yard	145	18
	Other Ferrous	cubic yard	225	18
	Other Non-Ferrous	cubic yard	225	18
	Remainder/Composite Metal (avg of metals, without used oil filters)	cubic yard	143	18
	HVAC Ducting	cubic yard	47	18

1	Oregon Department of Environmental Quality. 2007 Oregon Material Recovery and Waste Generation Rates Report September 2008 08-LQ-092. Attachment B: Measurement Standards and Reporting Guidelines 07-LQ-134. http://www.deq.state.or.us/lq/pubs/docs/sw/MRAttachmentB.pdf
2	Department of Ecology, State of Washington. Coordinated Prevention Grant Conversion Sheet. March, 2014. www.ecy.wa.gov/pubs/1107016.pdf
3	Factor developed using lead per battery data from Battery Council International. Recycling Rates 2009 to 2013. April 2014. http://c.ymcdn.com/sites/batterycouncil.org/resource/resmgr/BCI_Recycling_Rate_Study_200.pdf applied to battery composition data from Sulllivan, JL and Gaines, L. 2010. A Review of Battery Life Cycle Analysis: State of Knowledge and Critical Needs. October 2010. Center for Transportation Research, Energy Systems Division, Argonne National Laboratory ANL/ESD/10-7.
4	Keep America Beautiful. Volume-to-Weight Recycling and Trash Conversion Factors Report. December 2013.
5	Rubber Manufacturers Association (RMA). 2013 U.S. Scrap Tire Management Summary. November 2014. http://www.rma.org/download/scrap-tires/market-reports/US_STMarket2013.pdf
6	California Integrated Waste Management Board. Targeted Statewide Waste Characterization Study: Detailed Characterization of Construction and Demolition Waste. June 2006. http://www.calrecycle.ca.gov/publications/Documents/Disposal%5C34106007.pdf
	Brown Goods: larger, non-portable electronic goods that have some circuitry. Examples include microwaves, stereos, VCRs, DVD players, radios, audio/visual equipment, and non-CRT televisions (such as LCD televisions).
	Computer-related Electronics: electronics with large circuitry that is computer-related. Examples include processors, mice, keyboards, laptops, disk drives, printers, modems, and fax machines.
	Other Small Consumer Electronics: portable non-computer-related electronics with large circuitry. Examples include personal digital assistants (PDAs), cell phones, phone systems, phone answering machines, computer games and other electronic toys, portable CD players, camcorders, and digital cameras.
7	Keep America Beautiful, Recycle-Bowl Competition. Accessed February 2015. http://recycle-bowl.org/wp-content/uploads/Recycle-Bowl-Estimating-Data-Fact-Sheet.pdf
8	Great Forest. Volume to Weight Conversion Ratios for Commercial Office Waste in New York City. January 2013. Primary data; Commingled; large commercial properties (500,000 sq. ft – 1m sq. ft) in the New York metropolitan area. http://www.greatforest.com/files/FileUpload/files/Great%20Forest%20-%20Waste%20Conversion%20Paper%20-
9	US EPA Electronics Waste Management in the United States Through 2009 . May 2011.
10	WasteCare Corporation. Some Typical Loose and Baled Weights of Various Materials. Accessed April 2015. http://www.wastecare.com/Products-Services/Balers/aboutbalers.htm.
11	The Aluminum Association. U.S. Aluminum Beverage Can Recycling. http://www.aluminum.org/sites/default/files/section_images/UBCRecyclingRate2013.pdf
12	The Association of Postconsumer Plastic Recyclers (APR). Model Bale Specifications. http://www.plasticsrecycling.org
13	Caldwell, Maggie. Recycling Plastic Film and Shrink Wrap. May 16, 2014. http://www.federalinternational.com/blog/recy
14	Caterpillar Performance Handbook. 40th Edition. January 2010.
15	Minnesota Pollution Control Agency. Data provided by professional composter. 2015. Source separated organics - food scraps, non-recyclable paper (paper plates/towels/etc) and compostable plastics.
16	Minnesota Department of Administration 2015 hauler records (excludes organics).
17	Minnesota Pollution Control Agency. 2013 MPCA MSW Landfill Annual Report Data.
18	California Integrated Waste Management Board. Targeted Statewide Waste Characterization Study: Detailed Characterization of Construction and Demolition Waste. June 2006
19	Tellus scaled down by factor from Florida C&D study -- Converting C&D Debris from Volume to Weight: A Fact Sheet for C&D Debris Facility Operators, University of Florida, 2000.
20	Florida Dept of Environmental Protection http://www.dep.state.fl.us/waste/categories/recycling/cd/canddmain.htm
21	CalRecycle. 2014 Generator-Based Characterization of Commercial Sector Disposal and Diversion in California. September 10, 2015. http://www.calrecycle.ca.gov/Publications/Documents/1543/20151543.pdf Organics - putrescible material hauled by a contracted third party to a permitted facility mainly engaged in producing compost or mulch, or in anaerobic digestion of organics. Minor mechanical separation of contaminants or recyclable materials may occur at the facility prior to composting or digestion.
22	Goldstein, Nora. "Food Scraps Composting Laboratory". *BioCycle.* January 2013, Vol. 54, No. 1, p. 33. https: //www .biocycle.net/2013/01/22/food-scraps-composting-laboratory/
23	U.S. EPA. Standard Volume-to-Weight Conversion Factors. Last updated: February 28, 2006. https://www.epa.gov/smm/metrics-waste-reduction
24	National Center for Electronics Recycling (NCER). http://www.electronicsrecycling.org/ Mixed monitors and TVs: total pounds collected divided by total units collected.

Appendix E

Surveys

Residential Food Scrap Management Survey

The Tennessee Department of Environment and Conservation (TDEC) would like to understand how residents manage food waste at home. This survey seeks to gather information about resident's options for food waste diversion and the desire for increased food recycling/diversion services.

We appreciate you taking a couple of minutes to complete our survey. Please only complete one survey per household.
Estimated time to complete the survey is 3-5 minutes.

When you submit this form, it will not automatically collect your details like name and email address unless you provide it yourself.

* Required

1. Do you live in Tennessee? *

- (●) Yes
- ( ) No

2. How long have you lived in Tennessee? *

- ( ) 0-3 years
- ( ) 4-6 years
- ( ) 7-10 years

Quantifying Internally Managed Commercial Recyclable Materials in Tennessee

The Tennessee Department of Environment and Conservation (TDEC) would like to collect information from businesses that internally manage recyclable materials. This survey seeks to identify businesses that internally manage recyclable materials and quantify the amount of material managed on an annual basis.

We appreciate you taking a couple of minutes to complete our survey.
Estimated time to complete the survey is 3-5 minutes.

When you submit this form, it will not automatically collect your details like name and email address unless you provide it yourself.

* Required

1. What region of Tennessee is your business located in? *

- [ ] West
- [ ] Middle
- [ ] East

This question is required.

2. How many physical locations/facilities does your business operate? *

- ◯ 5 or less
- ◯ 6-10
- ◯ 11-25
- ◯ 26-50
- ◯ 50 or more

This question is required.

3. How many staff does your business employ across all locations? *

- ◯ 15 or less
- ◯ 16-50
- ◯ 51-100
- ◯ 100 or more

This question is required.

4. How would you classify your business' industry? *

- ◯ Grocery
- ◯ Landscaping and arborist
- ◯ Retail and wholesale distribution
- ◯ Construction and demolition
- ◯ Manufacturing
- ◯ Food and beverage

- ◯ Automotive
- ◯ Agriculture
- ◯ Other

This question is required.

5. Does your business recycle? *

- ◯ Yes
- ◯ No

This question is required.

6. How are recyclable materials collected? *

- ◯ Contracted hauler
- ◉ Managed internally by your business
- ◯ Other

7. Which recyclable materials are managed internally by your business? Please select all that apply. *

- ☐ Office Paper
- ☐ Cardboard
- ☐ Aluminum/Bi-Metal Cans
- ☐ Plastics

- [ ] Textiles
- [ ] Glass
- [ ] Yard Waste
- [ ] Wood Waste
- [ ] Wooden Pallets
- [ ] Electronics
- [ ] Toner Cartridges
- [ ] Batteries
- [ ] Automotive products (fluids, parts, etc.)
- [ ] Construction and Demo Debris
- [ ] Scrap Metal
- [ ] Tires
- [ ] Food waste (Donated to feed people)
- [ ] Food Scraps (processed or used as animal feed)
- [ ] Food Scraps (composted or anaerobically digested)
- [ ] Other

This question is required.

8. For each material type identified above, please indicate the estimated amount of material recycled annually with the unit of measurement (Pounds, Gallons, Cubic Yards, or Tons). *

Enter your answer

This question is required.

9. For the materials your business manages internally, please indicate how they are managed. *

- [ ] Backhaul to a processor or broker
- [ ] Internally reuse
- [ ] Process on-site
- [ ] Provide to third party for reuse
- [ ] Dispose
- [ ] Other

This question is required.

⚠ 8 question(s) need to be completed before submitting: Question 1,Question 2,Question 3,Question 4,Question 5,Question 7,Question 8,Question 9.

- ◯ 10+ years

3. What Grand Division of Tennessee do you live in? *

- ◯ West Tennessee
- ◯ Middle Tennessee
- ◯ East Tennessee

4. What county do you live in? *

Enter your answer

5. What housing type do you live in? *

- ◯ Single-family home
- ◯ Apartment/Condo
- ◯ Multi-family home (duplex triplex)

6. How many people are in your household? *

- ◯ 1
- ◯ 2
- ◯ 3
- ◯ 4

- ◯ 5
- ◯ 6
- ◯ 7
- ◯ 8
- ◯ 9
- ◯ Other

7. How supportive are you of improving sustainability in Tennessee by reducing food waste? *

Not Supportive ☆ ☆ ☆ ☆ ☆ Very Supportive

8. Please provide feedback regarding your selection above.

Enter your answer

9. What do you do with uneaten food and inedible food scraps you generate at home? (select all that apply) *

- ☐ Dispose with trash at the curb
- ☐ Dispose at your home in-sink garbage disposal
- ☐ Separate from trash and place curbside for collection
- ☐ Transport on your own to a drop-off collection location

- [ ] Compost at home
- [ ] Use as feed for animals
- [ ] Other

10. What is the estimated volume of uneaten food/inedible food scraps you generate at home during an average week? *

- ( ) 1 gallon or less
- ( ) 1-5 gallons
- ( ) 5 gallons or more
- ( ) Unknown/unable to estimate

11. What types of food waste composting services do you know are available to you? *

- [ ] Curbside collection
- [ ] Drop-off collection
- [ ] No compost services
- [ ] Not sure

12. Please list the names of the businesses offering composting services.

Enter your answer

13. If convenient, reliable food waste composting services were available, how likely is it that you would participate? *

- ◯ Very likely
- ◯ Somewhat likely
- ◯ Neither likely nor unlikely
- ◯ Somewhat unlikely
- ◯ Very unlikely
- ◯ I already compost food waste

14. What barriers or concerns do you have to participate in a food waste/scraps composting program? *

- ☐ Cost
- ☐ No or limited services in my area
- ☐ Lack of knowledge
- ☐ Gross factor
- ☐ Other

15. Please provide any additional comments or feedback on food waste composting in the State of Tennessee.

Enter your answer

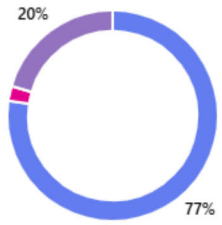
Responses Overview

Active

Responses	Average Time	Duration
44	11:15	186 Days

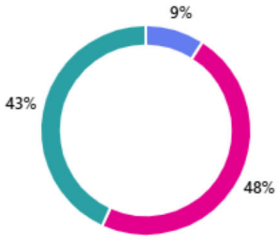
1. Which of the following best describes your position/knowledge of waste management:

County-level solid waste coordinator	34
City/other municipal (not County) solid waste coordinator	1
Private solid waste service provider	0
Other	9



2. What Grand Division of Tennessee are you located in?

West	4
Middle	21
East	19



3. What county of Tennessee are you located in?

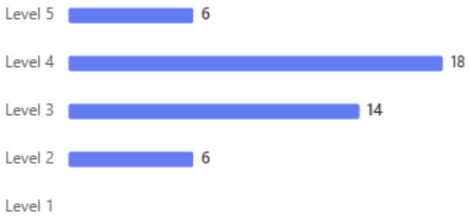
44
Responses

Latest Responses
"Morgan"
"Cheatham"
"Williamson"
...

2 respondents (5%) answered County for this question.

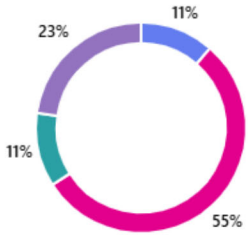
4. Generally, how supportive is your community of sustainable solid waste management efforts (i.e. waste reduction, reuse, recycling, compo sting, etc.)?

3.55
Average Rating



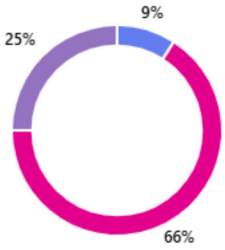
5. To your knowledge, do any local solid waste planning documents discuss/address food waste minimization/diversion?

Yes	5
No	24
Maybe	5
Unknown	10



6. Do you know if private haulers, municipalities or other entities provide separate food waste collection services from residents or business es in your community?

Yes	4
No	29
Maybe	0
Unknown	11



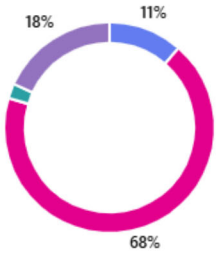
7. Please provide details of known food waste only collection services in your community (i.e. name of hauler, curbside collection, drop-off c ollection, materials accepted, onsite management (typically commercial), program/service contact information).

4
Responses

Latest Responses
...

8. Do you know of non-disposal facilities, such as composting sites, anerobic digesters, farms, etc. in your community that accept/take sourc e-separated food waste for beneficial use?

Yes	5
No	30
Maybe	1
Unknown	8



9. Please provide details (i.e. names, owners/operators, addresses, etc.) of all known facilities/locations that to your knowledge accept sourc e-separated food waste for processing and beneficial use.

6
Responses

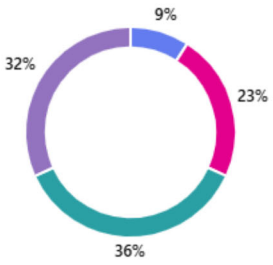
Latest Responses
"The Compost Company"
...

5 respondents (83%) answered Composting for this question.

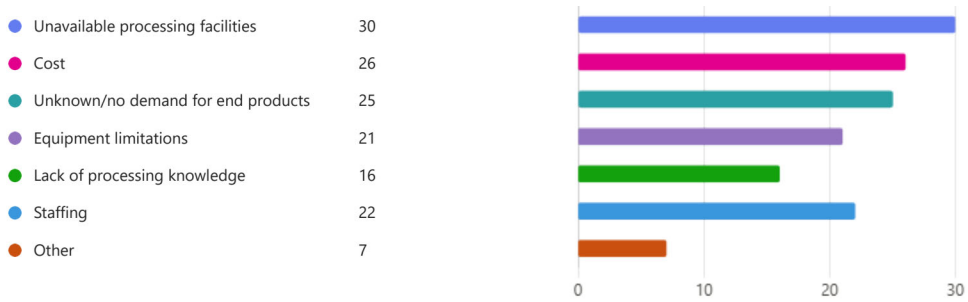
RD Memphis **Composting** Composting company Facility

10. Is there public interest to collect source-separated food waste in your community?

Yes	4
No	10
Maybe	16
Unknown	14



11. In your eyes, what are the most significant barriers in your area/region to starting or expanding food waste diversion programs?



12. Please provide additional comments or feedback on food waste diversion in your community for TDEC staff to consider.

44
Responses

Latest Responses

"Really not versed enough in the subject to make an informed decision. Would be ..."

"None"

"We struggle with the residents placing recycle commodities in with their trash or ..."

• • •

13 respondents (30%) answered food waste for this question.

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