FINAL REPORT

2024 Waste Composition Study

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PREPARED FOR

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Solid Waste & Recycling Division
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Section 1
Introduction

1.1 Purpose and Scope

Chatham County (County) contracted with Kessler Consulting, Inc. (KCI) to conduct a Waste Composition Study (WCS) to determine the composition of solid waste collected at the County's collection centers.

The WCS consisted of sampling and sorting materials from the County's solid waste compactors and pre-crushers from each of its 12 collection centers. The WCS also included visual audits of bulky wastes collected in open-top roll-offs at the collection centers.

The goal of the WCS was to analyze the waste streams at the collection centers to determine if recyclable materials are being disposed properly and evaluate the potential for additional recycling or recovery programs. Results of this WCS will help the County to better focus their education and enforcement efforts. The WCS was also conducted to evaluate changes in the waste stream compared to similar studies KCI conducted for the County in 2021, 2017, and 2014. Comparisons of the results from these previous WCSs are provided herein. Note: Comparison to the 2011 WCS, which was not conducted by KCI, is not included in this comparison due to possible differences in the methodology and categories.

1.2 Background

Chatham County operates 12 collection centers that receive household and bulky waste from residents in the unincorporated areas of the County. Each center has a compactor for household waste and one or two bulky waste roll-off containers, and two centers (Cole Park and Pittsboro) have additional pre-crushers for bulky waste.

Each of the collection centers also has receptacles for collecting mixed recyclables, which include the following materials:

- Aluminum cans
- Steel cans
- Mixed paper
- Corrugated cardboard
- Aseptic cartons
- Plastic bottles, jugs, jars, and tubs

In addition to waste and mixed recyclables, each collection center also accepts the following separated materials for recycling:

- Glass containers
- Scrap metal
- Clothing & shoes
- Electronics
- Household batteries
- Oil filters and used motor oil

- Lead acid batteries
- Tires

Clean expanded polystyrene foam, yard waste, pallets, and inert debris (brick, concrete, rock, dirt, soil, sand) are also collected separately at the County's Main Facility.

Following the WCS that KCI conducted in 2017, the County launched a construction & demolition (C&D) debris recycling program at four of its collection centers (Goldston, Hadley, Martha's Chapel, and Pittsboro). Since 2021, the program has expanded to all collection centers. This program accepts most types of C&D debris except asbestos, brick, and concrete.

1.3 Acknowledgements

KCI would like to acknowledge and thank all County staff members who assisted with the planning, logistics, and fieldwork of this WCS. The cooperation and positive attitudes of everyone involved were essential to the success of the WCS.

Section 2
Methodology

2.1 Locations, Equipment, and Labor

Fieldwork was conducted over the course of three days on March 11-13, 2024. All sampling and sorting activities and visual audits took place at the County's Solid Waste & Recycling Main Facility located at 28 County Services Road, Pittsboro, NC 27312. KCI worked with County staff to coordinate and set up a location at the facility that would ensure worker safety and facilitate sampling and removal of waste from the site. In addition, the County worked with North Carolina's Department of Environmental Quality to develop a protocol to safely allow waste to be tipped at the site for the WCS.

KCI provided a Field Manager, all sorting equipment, and safety gear. The County provided a loader and operator to gather samples at the direction of KCI's Field Manager. Sort labor was provided by KCI through an agreement with Express Employment of Asheboro. In addition, County staff assisted with sorting activities.

KCI prepared and County staff reviewed and approved a Site Safety Plan that was followed throughout the fieldwork. Sorters were given thorough safety instructions by KCI's Field Manager to ensure safety and proper sorting. No injuries or emergencies occurred during the sorting event.

2.2 Material Streams

The WCS assessed all waste collected at the County's 12 collection centers. Three waste streams (i.e., collection container types) were evaluated during the WCS:

- Waste Compactors (manually sorted)
- Bulky Waste Pre-Crushers (manually sorted)
- Bulky Waste Roll-Offs (visually characterized)

2.3 Material Categories

KCI worked with County staff to develop a list of 54 material categories into which the compactor and pre-crusher waste was sorted. The final list of material categories and descriptions is provided in Appendix A.

Similarly, a list of material categories (Appendix B) was used in the visual audit of bulky waste based on commonly found material in bulky waste and C&D debris.

KCI worked to define categories that expanded and refined, while maintaining continuity with, those from prior WCSs.

2.4 Sampling and Sorting Procedures

All sampling and sorting procedures were conducted in accordance with the Sampling and Sorting Protocol developed by KCI and approved by the County before the fieldwork was initiated.

Per the County's direction, all of the compactors and pre-crushers and one bulky waste roll-off at each of the County's 12 collection centers were included in this WCS. In total, 16 samples of waste were manually sorted (one from each of the 12 compactors and two from each of the two pre-crushers), and KCI's Field Manager performed visual audits on all 12 bulky waste roll-off loads during the three-day sorting event.

Upon the trucks arriving at the facility, KCI's Field Manager confirmed with County staff the container type and collection center from which it originated. Once the materials in each compactor and pre-crusher vehicle were tipped, a representative sample of at least 200 pounds was selected from each load and placed on a tarp, where they were staged until sorted. Due to space and hauling limitations at the site, only a portion (approximately 1-2 tons) of each compactor or pre-crusher was tipped. KCI's Field Manager ensured a sufficient quantity of material was tipped to allow a representative sample to be pulled. After sampling, the remaining material was loaded into a transfer trailer by County staff for disposal.

Individual samples were transferred onto KCI's custom sorting table where they were hand-sorted into the previously defined material categories using labeled containers of various sizes. Throughout and at the end of the sorting of each sample, KCI's Field Manager verified that material within each category's container was correctly sorted. After the entire sample was sorted, KCI's Field Manager weighed and recorded the net weights of each material category using a tablet-based data log.

2.5 Visual Audit Procedures

Because bulky wastes are not conducive to manual sorting and weighing, KCI's Field Manager visually characterized the waste generated in each of the collection center roll-offs to estimate the composition of incoming bulky wastes.

Upon the trucks arriving at the facility, KCI's Field Manager confirmed with County staff the collection center from which it originated. Once the entire load was tipped, KCI's Field Manager visually divided each load into six equal sections and characterized each section by estimating the percent by volume of identifiable items and materials as listed in Appendix B. Note: For smaller or more uniform loads, the load was divided into fewer equal sections for the visual audit. These percentages were recorded using a tablet-based data log. Detailed photographs were taken of each load. After auditing, the material was loaded into a transfer trailer and/or roll-offs by County staff for disposal.

2.6 Analytical Procedures

After the fieldwork, KCI calculated the weighted average of each material category to obtain the composition of compactor waste, pre-crusher waste, and bulky waste. The average composition was calculated by weighting each sample's composition by the annual tonnage for that respective sample's collection center and waste stream to ensure the composition is more

representative of the overall waste stream. For example, a collection center with more tonnage would contribute more to the overall waste stream than centers with fewer tons; therefore, it would be weighted more in the composition. Data analysis followed industry-accepted standards for statistical sampling, as outlined in the *ASTM Standard Test Method for Determination of the Composition of Unprocessed Municipal Solid Waste (D5231-92; reapproved 2016)*. Where appropriate, a 90 percent confidence interval was calculated, using a standard statistical t-distribution table, for each material category in the composition.

To assist the County in further quantifying the bulky waste stream, KCI applied industry-accepted conversion factors to convert the visual audit results (percent by volume) to percent by weight.

KCI has included additional data analysis in this study to further assist the County in their waste diversion and recovery efforts. The overall Countywide waste composition was calculated by combining the composition of compactor waste, pre-crusher waste, and bulky waste (weighted by their respective annual tons). Finally, using annual waste and recycling tonnages and the results of this WCS and the recyclables composition study (RCS), which KCI conducted for the County in 2023, KCI calculated the recyclables capture rate of select materials accepted in the County's recycling program. Additionally, the capture rate of C&D debris in the C&D recycling program and the capture rate of textiles in the textile recycling program were calculated.

Section 3
Results

3.1 Introduction to Results

The composition of each waste stream measured in the WCS is presented in this section. All results are expressed in percentage by weight or volume (bulky waste visual audits). The percentages included in the tables and figures are the weighted average values for each material category. For compactor waste and bulky waste visual audits, the results also provide a 90 percent confidence interval for each material category.[1] Because of the limited amount of pre-crusher waste to sample, a confidence interval for this waste stream would not be appropriate.

For the purposes of discussion and analysis, hand-sorted materials (compactor and pre-crusher waste) were grouped into seven broad categories based on diversion potential, as outlined below. Bulky waste was grouped as indicated in Appendix B.

- Program Recyclable Paper: Paper materials that are currently accepted in the County's mixed recycling collection containers at its collection centers.
  - Corrugated Cardboard
  - Newspaper
  - Magazines and Catalogs
  - Mixed Recyclable Paper
  - Aseptic/Polycoated Containers
- Program Recyclable Containers: Plastic and metal containers that are accepted in the County's mixed collection containers at its collection centers.
  - PET Bottles (#1)
  - HDPE Bottles (#2)
  - Other Narrow-Neck Bottles
  - Plastic Tubs
  - Tin/Steel Cans
  - Aluminum Cans
  - Nonhazardous Aerosol Cans
- Accepted C&D Debris: Materials accepted in the County's C&D recycling program at its collection centers.
  - Carpet
  - Clean Wood Waste
  - Treated Wood Waste
  - Other Accepted C&D Debris
- Other Accepted Recyclable Materials: Other materials that are separately accepted for recycling at the County's collection centers and/or the Main Facility.
  - Expanded Polystyrene Foam[2]
  - Ferrous Scrap Metals
  - Aluminum Foil and Trays
  - Non-Ferrous Scrap Metals
  - Glass Containers
  - Textiles[3]
  - Oil Filters
  - Lead-Acid Batteries

[1] The confidence interval indicates that with a 90 percent level of confidence the actual arithmetic mean is within the upper and lower limits shown. This interval provides an understanding of how much variation occurred in the quantity of that material category found in the samples sorted. Generally, the more homogeneous the stream and the greater the number of samples sorted, the higher the level of accuracy achieved and the narrower the margin between the upper and lower bounds of the confidence interval. Because this is a statistical analysis, the lower end of the confidence interval may be a negative number.
[2] Dirty expanded polystyrene foam, which would not be accepted in the program, was not separately sorted during the WCS.
[3] Includes some textiles, such as bedding, that would not be accepted in the County's textile recycling program.

  - Computers
  - Televisions
  - Other E-Waste and Technotrash[4]
  - Household Batteries
  - Pallets
  - Brick and Concrete
  - Tires and Rubber

- Potentially Compostable Materials: Materials that potentially could be composted in a commercial composting facility if properly source-separated and/or processed.
  - Compostable Paper
  - Yard Waste
  - Food Waste

- Other Potentially Recoverable Materials: Materials that have the potential to be recycled but are not currently collected for recycling at the County's collection centers or Main Facility, due to market or local processing limitations.
  - Bagged Shredded Paper
  - Plastic Drink Cups
  - Plastic Clamshells
  - Plastic Bottles That Held Toxics
  - Other Plastic Containers
  - Bulky Rigid Plastics
  - Mattresses

- All Other Materials: Other materials not classified above.
  - All Other Paper
  - Non-Rigid Plastic Film
  - All Other Plastics
  - Small Appliances
  - Other Glass
  - Other Special Wastes
  - Other Unaccepted C&D Debris
  - Furniture
  - Pet Waste
  - Diapers
  - Composite Materials
  - Liquids
  - Grit

[4] Includes some materials that would not be accepted in the County's e-waste recycling program

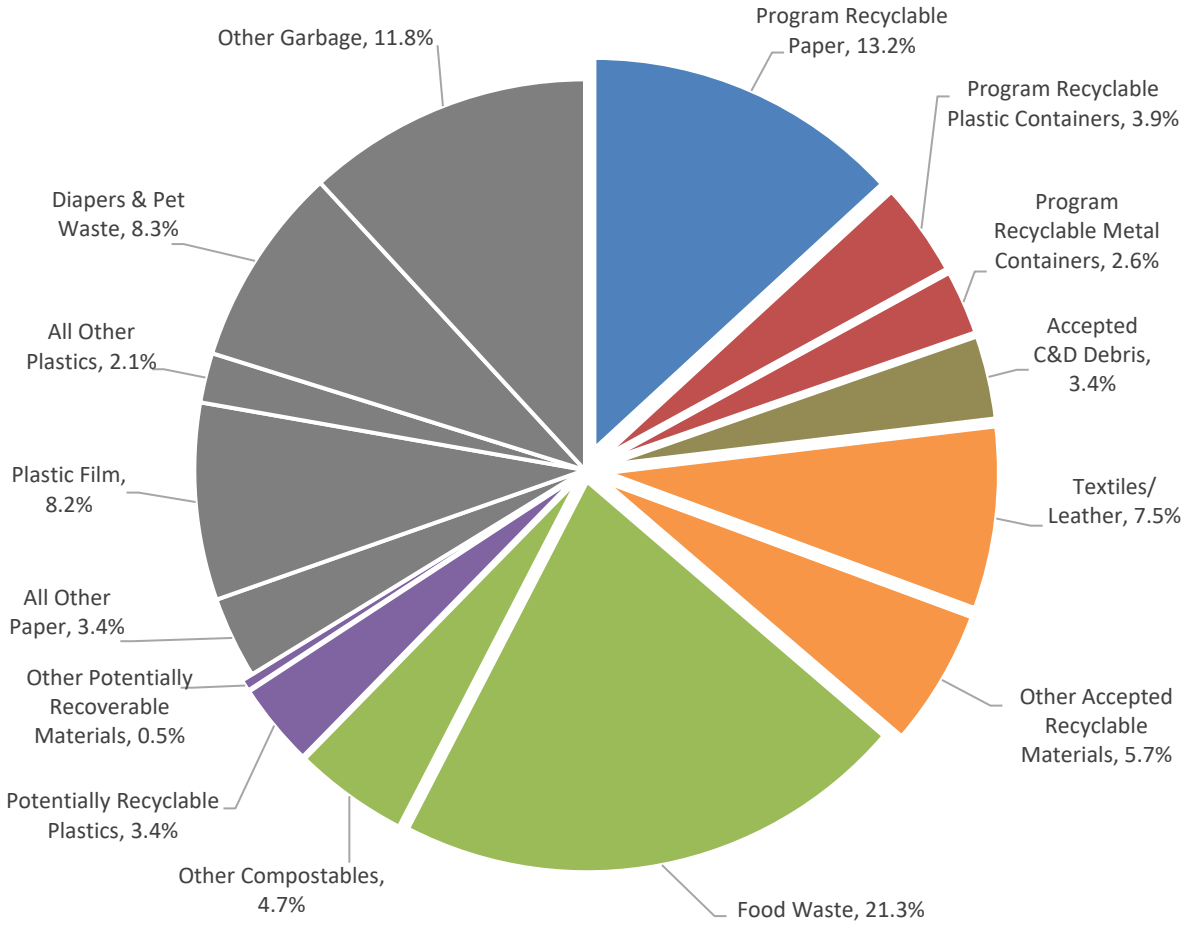
3.2 Compactor Waste

Figure 3-1 depicts the weighted average composition of compactor waste. Table 3-1 shows the detailed weighted average composition of compactor waste with a 90 percent confidence interval and compares the results to the previous WCSs. Individual sample data for the compactor samples can be found in Appendix C.

Key findings from the compactor waste composition data include:

- About 20 percent of the compactor waste was material accepted in the County's mixed recycling stream. Over half of this was Corrugated Cardboard and Mixed Recyclable Paper. PET Bottles were the most significant type of Program Recyclable Container, at nearly 3 percent of the stream. The total average percentage of Program Recyclables has shown a decreasing trend since 2014.
- The percentage of Accepted C&D Debris in the compactor waste was about 3 percent, which was mostly Treated Wood Waste. Since 2014, the average percentage of Accepted C&D Debris has been a minor component of the compactor waste, ranging from 3-5 percent.
- Other Accepted Recyclable Materials was about 13 percent of the compactor waste. Textiles comprised the vast majority of this, followed by Glass Containers and Expanded Polystyrene Foam. While the average percentage of Textiles has increased since 2014, the confidence interval is very wide due to high variability between samples in the percentage of textiles. The average percentage of Glass Containers has decreased substantially since 2014.
- Over a quarter of the compactor waste was Potentially Compostable Materials, the vast majority being Food Waste. This has remained fairly constant over the years; however, it should be noted that Compostable Paper and All Other Paper were not separately sorted in 2017 and 2014, so the percentage of Compostable Paper was higher in those years because it included what would now be considered All Other Paper (i.e., paper that is non-recyclable and non-compostable).
- Potentially Recoverable Materials comprised about 4 percent of the compactor waste. Potentially recyclable plastic, which included plastic containers that are not currently accepted in the County's recycling program and bulky rigid plastics, was nearly all of this group. This group has not had any significant changes since 2014.
- The remaining third of the waste stream was All Other Materials. Major materials in this group were Non-Rigid Plastic Film, Composite Materials, Diapers, and All Other Paper. This group has remained about a third of the waste stream since 2017, when it increased from about 22 percent in 2014.

Figure 3-1: Composition of Compactor Waste



Note: For the purpose of this figure, the following categories have been combined:

- Program Recyclable Paper includes the categories of Corrugated Cardboard, Newspaper, Magazines and Catalogs, Mixed Recyclable Paper, and Aseptic/Polycoated Containers.
- Program Recyclable Plastic Containers includes the categories of PET Bottles (#1), HDPE Bottles (#2), Other Narrow-Neck Bottles, and Plastic Tubs.
- Program Recyclable Metal Containers includes the categories of Tin/Steel Cans, Aluminum Cans, and Nonhazardous Aerosol Cans.
- Accepted C&D Debris includes the categories of Carpet, Clean Wood Waste, Treated Wood Waste, and Other Accepted C&D Debris.
- Other Accepted Recyclable Materials includes the categories of Expanded Polystyrene Foam, Ferrous Scrap Metals, Aluminum Foil and Trays, Non-Ferrous Scrap Metals, Glass Containers, Oil Filters, Lead-Acid Batteries, Computers, Televisions, Other E-Waste and Technotrash, Household Batteries, Pallets, Brick and Concrete, and Tires and Rubber.
- Other Compostables includes the categories of Compostable Paper and Yard Waste.
- Potentially Recyclable Plastics includes the categories of Plastic Drink Cups, Plastic Clamshells, Plastic Bottles That Held Toxics, Other Plastic Containers, Bulky Rigid Plastics, and Expanded Polystyrene Foam.
- Other Potentially Recoverable Materials includes the categories of Bagged Shredded Paper and Mattresses.
- Other Garbage includes the categories of Small Appliances, Other Glass, Other Special Wastes, Unaccepted C&D Debris, Furniture, Composite Materials, Liquids, and Grit.

Table 3-1: Composition of Compactor Waste and Comparison to Previous WCSs

Material Category	2024	90% Confidence Interval		2021	2017	2014
		Lower Bounds	Upper Bounds			
Corrugated Cardboard	3.9%	2.6%	5.2%	2.6%	3.8%	4.3%
Newspaper	0.1%	0.0%	0.2%	0.2%	2.3%	3.4%
Magazines and Catalogs	1.5%	0.8%	2.1%	10.4%	9.8%	14.5%
Mixed Recyclable Paper	7.4%	6.4%	8.4%			
Aseptic/Polycoated Containers	0.3%	-0.4%	1.0%	0.3%	0.3%	0.3%
Program Recyclable Paper	**13.2%**	**11.6%**	**14.7%**	**13.6%**	**16.2%**	**22.5%**
PET Bottles (#1)	2.6%	2.1%	3.2%	2.6%	2.3%	2.2%
HDPE Bottles (#2)	0.8%	0.6%	1.0%	1.1%	1.2%	1.1%
Other Narrow-Neck Bottles	0.1%	0.1%	0.2%	0.1%	0.1%	0.5%
Plastic Tubs	0.3%	0.2%	0.4%	0.3%	0.6%	0.8%
Tin/Steel Cans	1.5%	0.9%	2.1%	1.2%	1.5%	1.6%
Aluminum Cans	1.0%	0.7%	1.4%	1.2%	0.8%	0.9%
Nonhazardous Aerosol Cans	0.1%	0.0%	0.2%	0.4%	0.4%	0.4%
Program Recyclable Containers	**6.5%**	**5.5%**	**7.6%**	**7.0%**	**6.9%**	**7.5%**
Carpet	0.5%	0.2%	0.9%	0.6%	0.4%	1.4%
Clean Wood Waste	0.3%	-0.1%	0.7%	1.3%	0.4%	1.3%
Treated Wood Waste	2.5%	1.2%	3.9%	1.1%	2.1%	0.8%
Other Accepted C&D Debris	0.1%	0.0%	0.1%	0.8%	1.9%	1.0%
Accepted C&D Debris	**3.4%**	**2.0%**	**4.9%**	**3.8%**	**4.8%**	**4.5%**
Expanded Polystyrene Foam	1.3%	1.2%	1.5%	1.2%	1.4%	1.2%
Ferrous Scrap Metals	0.8%	0.4%	1.1%	0.8%	0.6%	0.5%
Aluminum Foil and Trays	0.7%	0.3%	1.0%	0.5%	n/a	n/a
Non-Ferrous Scrap Metals	0.2%	0.0%	0.4%	0.3%	0.6%	0.7%
Glass Containers	1.3%	0.6%	2.1%	4.4%	3.3%	6.1%
Textiles/Leather	7.5%	3.9%	11.1%	6.1%	4.3%	3.8%
Oil Filters	0.0%	0.0%	0.0%	0.1%	0.3%	0.0%
Lead-Acid Batteries	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Computers	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Televisions	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Other E-Waste and Technotrash	1.2%	0.7%	1.7%	1.5%	0.6%	1.6%
Household Batteries	0.1%	0.1%	0.1%	0.1%	0.2%	0.2%
Pallets	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Brick and Concrete	0.0%	0.0%	0.0%	0.6%	0.1%	0.1%
Tires and Rubber	0.1%	0.0%	0.2%	0.0%	0.7%	0.1%
Other Accepted Recyclable Materials	**13.2%**	**10.0%**	**16.4%**	**15.5%**	**12.0%**	**14.3%**
Compostable Paper	4.5%	3.5%	5.4%	5.5%	9.2%	9.4%
Yard Waste	0.3%	0.1%	0.5%	2.8%	1.0%	0.1%
Food Waste	21.3%	18.4%	24.2%	17.2%	17.2%	16.6%
Potentially Compostable Materials	**26.0%**	**22.8%**	**29.3%**	**25.5%**	**27.3%**	**26.1%**

Note: Columns may not appear to calculate correctly due to rounding.

Table 3-1: Composition of Compactor Waste and Comparison to Previous WCSs (continued)

Material Category	2024	90% Confidence Interval		2021	2017	2014
		Lower Bounds	Upper Bounds			
Bagged Shredded Paper	0.5%	-0.3%	1.2%	0.0%	0.0%	n/a
Plastic Drink Cups	0.5%	0.2%	0.8%	0.4%	0.3%	0.7%
Plastic Clamshells	0.4%	0.2%	0.5%	0.3%		
Plastic Bottles That Held Toxics	0.0%	0.0%	0.0%	0.2%	0.2%	0.2%
Other Plastic Containers	1.2%	0.9%	1.5%	0.4%	n/a	n/a
Bulky Rigid Plastics	1.3%	0.1%	2.6%	1.5%	1.6%	2.2%
Mattresses	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Potentially Recoverable Materials	**3.9%**	2.5%	5.4%	**2.7%**	**2.1%**	**3.0%**
All Other Paper	3.4%	2.4%	4.3%	2.9%	n/a	n/a
Non-Rigid Plastic Film	8.2%	7.3%	9.0%	8.5%	7.9%	5.7%
All Other Plastics	2.1%	1.3%	2.8%	2.1%	2.7%	1.5%
Small Appliances	0.6%	0.0%	1.2%	0.4%	0.0%	0.1%
Other Glass	1.0%	0.4%	1.6%	0.5%	1.1%	0.8%
Other Special Wastes	0.3%	0.1%	0.6%	0.5%	0.4%	0.1%
Other Unaccepted C&D Debris	1.3%	-0.5%	3.2%	0.6%	n/a	n/a
Furniture	1.2%	-1.4%	3.7%	0.0%	0.0%	0.9%
Pet Waste	2.8%	1.1%	4.5%	2.2%	6.1%	9.4%
Diapers	5.5%	3.3%	7.7%	2.6%	3.9%	
Composite Materials	6.0%	4.3%	7.6%	9.0%	6.8%	
Liquids	0.7%	0.3%	1.1%	1.4%	1.0%	0.7%
Grit	0.8%	0.2%	1.4%	1.2%	0.8%	2.8%
All Other Materials	**33.8%**	29.9%	37.6%	**32.0%**	**30.7%**	**22.0%**
Total	**100.0%**			**100.0%**	**100.0%**	**100.0%**

Note: Columns may not appear to calculate correctly due to rounding.

3.3 Pre-Crusher Bulky Waste

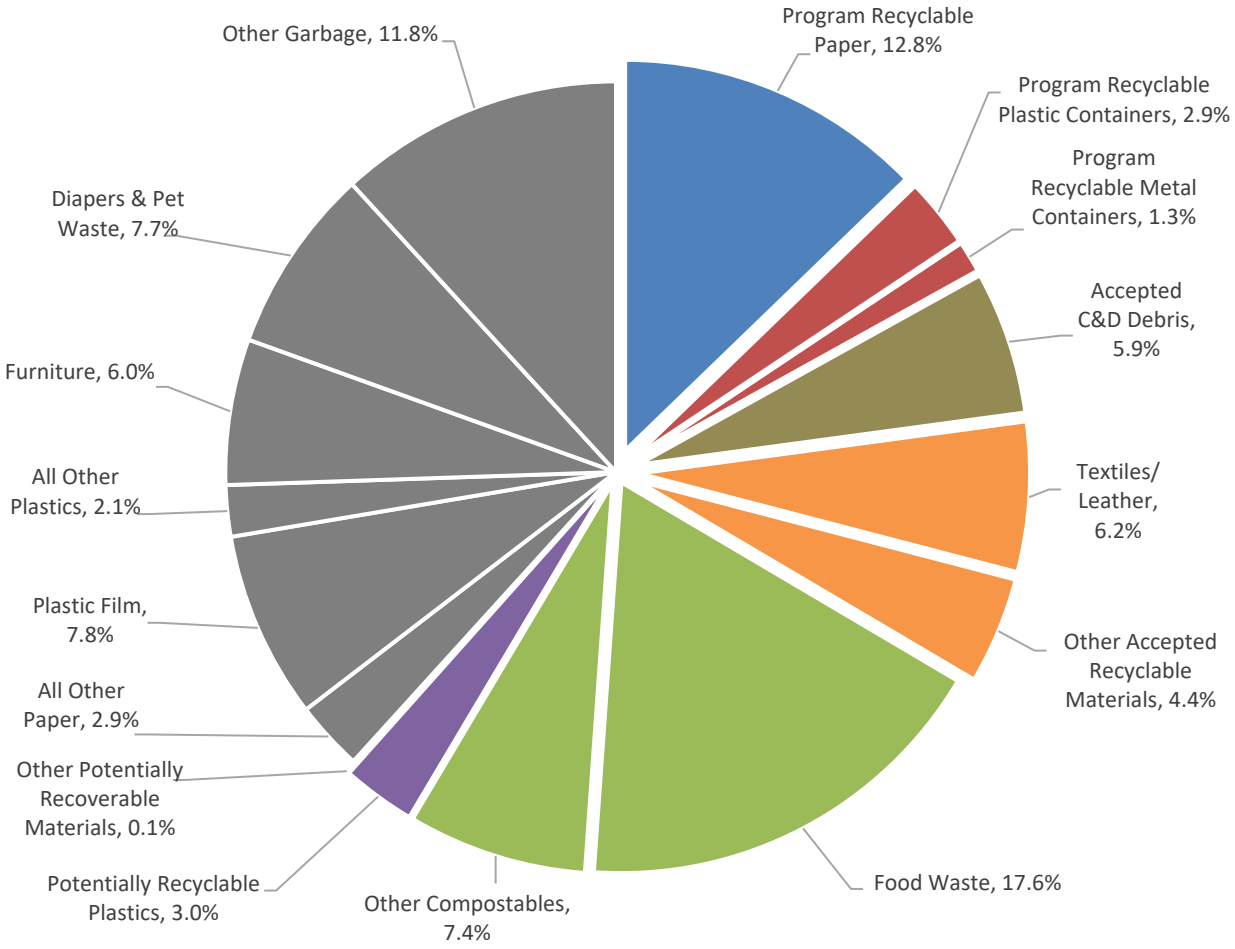
Figure 3-2 depicts the weighted average composition of pre-crusher bulky waste. Table 3-2 shows the detailed weighted average composition of pre-crusher bulky waste, as well as compares the results to the previous WCSs. Individual sample data for the pre-crusher samples can be found in Appendix C.

It should be noted that this composition only represents two loads of pre-crusher material and caution should be taken when drawing conclusions from these results. In 2024 and 2021, two samples were pulled from each load to increase reliability; however, in 2017 and 2014, only one sample was pulled from each load.

Due to the large amount of bagged material observed in the pre-crusher loads, the overall composition of the waste was similar to the compactor waste. County staff stated that the pre-crusher is used as a backup compactor when the compactor is full at these sites. Some key differences between the pre-crusher waste and compactor waste include:

- The total average percentage of Program Recyclables in the pre-crusher waste was about 17 percent, slightly lower than the compactor waste.
- The pre-crusher waste had almost twice the percentage of Accepted C&D Debris as compactor waste (5.9 versus 3.4 percent).
- While Yard Waste was negligible in the compactor waste, pre-crusher waste was about 3 percent yard waste.
- Pre-crusher waste also had a higher percentage of Furniture than compactor waste.

Figure 3-2: Composition of Pre-Crusher Waste



Note: For the purpose of this figure, the following categories have been combined:

- Program Recyclable Paper includes the categories of Corrugated Cardboard, Newspaper, Magazines and Catalogs, Mixed Recyclable Paper, and Aseptic/Polycoated Containers.
- Program Recyclable Plastic Containers includes the categories of PET Bottles (#1), HDPE Bottles (#2), Other Narrow-Neck Bottles, and Plastic Tubs.
- Program Recyclable Metal Containers includes the categories of Tin/Steel Cans, Aluminum Cans, and Nonhazardous Aerosol Cans.
- Accepted C&D Debris includes the categories of Carpet, Clean Wood Waste, Treated Wood Waste, and Other Accepted C&D Debris.
- Other Accepted Recyclable Materials includes the categories of Expanded Polystyrene Foam, Ferrous Scrap Metals, Aluminum Foil and Trays, Non-Ferrous Scrap Metals, Glass Containers, Oil Filters, Lead-Acid Batteries, Computers, Televisions, Other E-Waste and Technotrash, Household Batteries, Pallets, Brick and Concrete, and Tires and Rubber.
- Other Compostables includes the categories of Compostable Paper and Yard Waste.
- Potentially Recyclable Plastics includes the categories of Plastic Drink Cups, Plastic Clamshells, Plastic Bottles That Held Toxics, Other Plastic Containers, and Bulky Rigid Plastics.
- Other Potentially Recoverable Materials includes the categories of Bagged Shredded Paper and Mattresses.
- Other Garbage includes the categories of Small Appliances, Other Glass, Other Special Wastes, Other Unaccepted C&D Debris, Composite Materials, Liquids, and Grit.

Table 3-2: Comparison of Pre-Crusher Waste Composition to Previous WCSs

Material Category	2024	2021	2017	2014
Corrugated Cardboard	4.4%	4.5%	8.3%	3.2%
Newspaper	0.0%	1.3%	0.3%	4.0%
Magazines and Catalogs	1.6%	8.1%	2.6%	7.6%
Mixed Recyclable Paper	6.2%			
Aseptic/Polycoated Containers	0.5%	0.2%	0.3%	0.3%
Program Recyclable Paper	**12.8%**	**14.2%**	**11.5%**	**15.1%**
PET Bottles (#1)	1.8%	1.0%	0.6%	1.0%
HDPE Bottles (#2)	0.4%	0.6%	0.2%	1.7%
Other Narrow-Neck Bottles	0.1%	0.0%	0.0%	0.5%
Plastic Tubs	0.5%	0.4%	0.3%	0.5%
Tin/Steel Cans	0.6%	0.9%	0.6%	1.7%
Aluminum Cans	0.7%	0.4%	0.3%	1.1%
Nonhazardous Aerosol Cans	0.0%	0.2%	0.3%	1.0%
Program Recyclable Containers	**4.2%**	**3.5%**	**2.3%**	**7.5%**
Carpet	1.8%	1.2%	0.0%	3.2%
Clean Wood Waste	0.7%	5.5%	1.6%	9.4%
Treated Wood Waste	1.5%	6.3%	25.2%	9.8%
Other Accepted C&D Debris	1.9%	5.7%	1.5%	2.0%
Accepted C&D Debris	**5.9%**	**18.7%**	**28.4%**	**24.4%**
Expanded Polystyrene Foam	0.6%	1.0%	0.7%	1.7%
Ferrous Scrap Metals	0.3%	1.3%	0.5%	2.7%
Aluminum Foil and Trays	0.5%	0.2%	n/a	n/a
Non-Ferrous Scrap Metals	0.6%	0.1%	0.3%	0.3%
Glass Containers	0.9%	2.3%	0.1%	4.1%
Textiles/Leather	6.2%	6.0%	8.4%	5.1%
Oil Filters	0.0%	0.0%	0.0%	0.0%
Lead-Acid Batteries	0.0%	0.0%	0.0%	0.0%
Computers	0.0%	0.0%	0.0%	0.0%
Televisions	0.0%	0.0%	0.0%	0.0%
Other E-Waste and Technotrash	1.5%	0.8%	1.6%	3.7%
Household Batteries	0.0%	0.0%	0.0%	0.0%
Pallets	0.0%	0.0%	0.0%	1.3%
Brick and Concrete	0.0%	0.0%	0.0%	0.0%
Tires and Rubber	0.0%	0.0%	2.0%	0.0%
Other Accepted Recyclable Materials	**10.6%**	**11.8%**	**13.6%**	**18.9%**
Compostable Paper	4.5%	2.8%	5.5%	8.4%
Yard Waste	2.9%	2.6%	4.5%	0.0%
Food Waste	17.6%	11.6%	5.9%	6.3%
Potentially Compostable Materials	**25.1%**	**17.0%**	**15.9%**	**14.7%**

Note: Columns may not appear to calculate correctly due to rounding.

Table 3-2: Comparison of Pre-Crusher Waste Composition to Previous WCSs (continued)

Material Category	2024	2021	2017	2014
Bagged Shredded Paper	0.1%	0.0%	0.1%	n/a
Plastic Drink Cups	0.8%	0.0%	0.2%	0.2%
Plastic Clamshells	0.4%	0.1%		
Plastic Bottles That Held Toxics	0.0%	0.0%	0.1%	0.6%
Other Plastic Containers	0.7%	0.4%	n/a	n/a
Bulky Rigid Plastics	1.1%	5.5%	3.4%	2.4%
Mattresses	0.0%	0.0%	7.2%	0.0%
Potentially Recoverable Materials	**3.2%**	**6.1%**	**11.0%**	**3.2%**
All Other Paper	2.9%	1.9%	n/a	n/a
Non-Rigid Plastic Film	7.8%	6.2%	3.5%	5.4%
All Other Plastics	2.1%	1.4%	1.3%	0.7%
Small Appliances	0.0%	4.0%	0.0%	2.9%
Other Glass	1.1%	0.6%	0.4%	0.0%
Other Special Wastes	0.2%	0.0%	0.4%	0.0%
Other Unaccepted C&D Debris	2.5%	0.5%	n/a	n/a
Furniture	6.0%	1.0%	0.0%	0.0%
Pet Waste	4.8%	3.6%	4.3%	1.8%
Diapers	2.8%	0.2%	0.2%	
Composite Materials	4.6%	5.1%	5.8%	
Liquids	0.8%	0.2%	0.0%	0.0%
Grit	2.6%	3.8%	1.6%	5.3%
All Other Materials	**38.3%**	**28.7%**	**17.4%**	**16.1%**
Total	**100.0%**	**100.0%**	**100.0%**	**100.0%**

Note: Columns may not appear to calculate correctly due to rounding.

3.4 Bulky Waste Visual Audit

Figures 3-3 and 3-4 depict the composition of bulky waste by volume and by weight, respectively. Table 3-3 presents the composition of bulky waste as percent by volume with a 90 percent confidence interval and the conversion factors used to convert to percent by weight. Table 3-4 compares these results with the previous WCSs. Individual load data for the bulky waste audits can be found in Appendix D. Photographs of each bulky waste load can be found in Appendix E.

Caution is advised when using quantified data from visual audits. While KCI strives to be as accurate and consistent as possible with these audits, they are nevertheless limited based on what could be observed during the audit. Also, the types and quantities of materials within bulky waste can change dramatically from day to day. Furthermore, applying a standard industry density to calculate the percentage by weight has its own inherent inaccuracies and it does not necessarily represent the bulk density of the material observed during the audit.

Key observations from the bulky waste visual audits include:

- About 16 percent by volume/23 percent by weight of the bulky waste was C&D Debris. Carpet and Padding, Treated and Untread Wood, and Paned Glass represented nearly all of this. C&D Debris was minimal in most samples (less than 20 percent); however, the Asbury sample was about 75 percent (by volume) Untreated Wood and the Cole Park and Harper's Crossroads samples were about 30 percent (by volume) C&D Debris, mostly Carpet and Padding and Treated Wood. The percentage of C&D Debris in the bulky waste has decreased substantally since 2014.
- Furniture and Mattresses comprised nearly half (by volume) and almost a third (by weight) of the bulky waste.
- Corrugated Cardboard was about 5 percent (by volume) and 3 percent (by weight).
- Other Rigid Plastics was about 7 percent (by volume) and 3 percent (by weight).
- The bulky waste included minimal metal and organics; Other Ferrous Metals was about 2 percent by weight and Yard Waste was about 1 percent by weight.
- Other Materials were about 25 percent (by volume) and 38 percent (by weight). This was predominantly Bagged Household Garbage. Other significant categories included Mixed Residue (i.e., loose miscellaneous waste) and Other Appliances (which included multiple vacuums and Power Wheels®).

Figure 3-3: Composition of Bulky Waste (percent by volume)

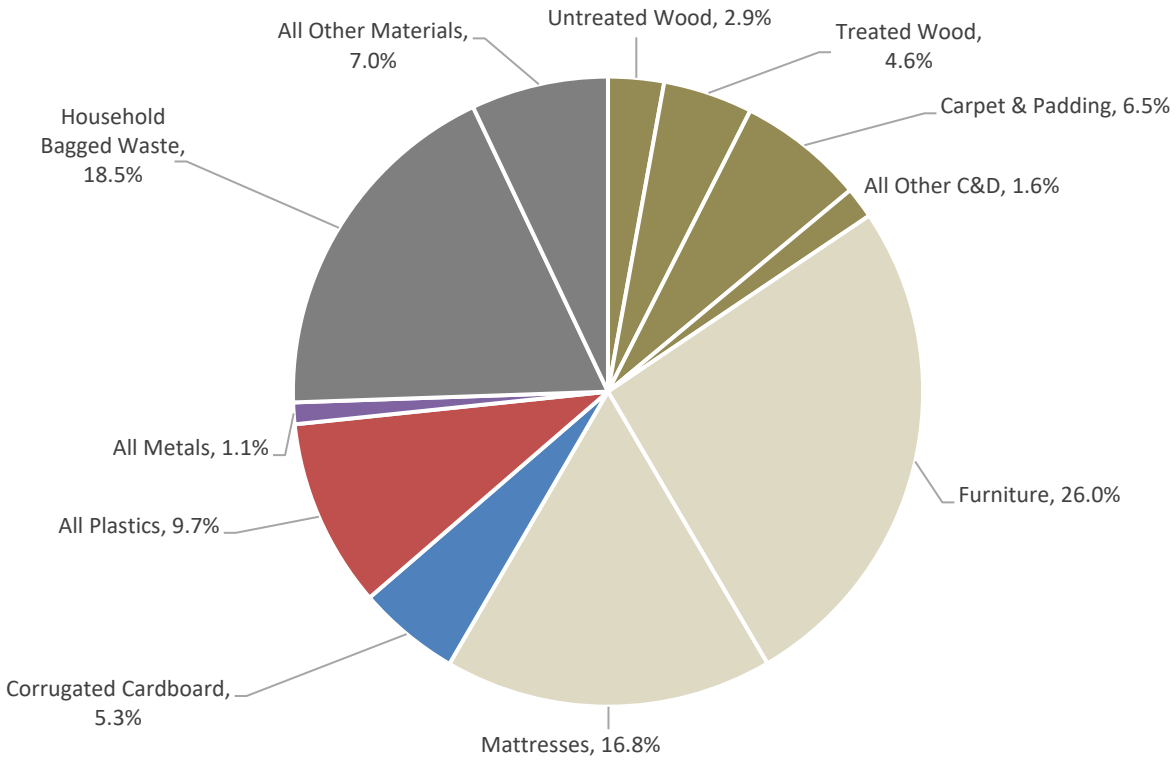


Figure 3-4: Composition of Bulky Waste (percent by weight)

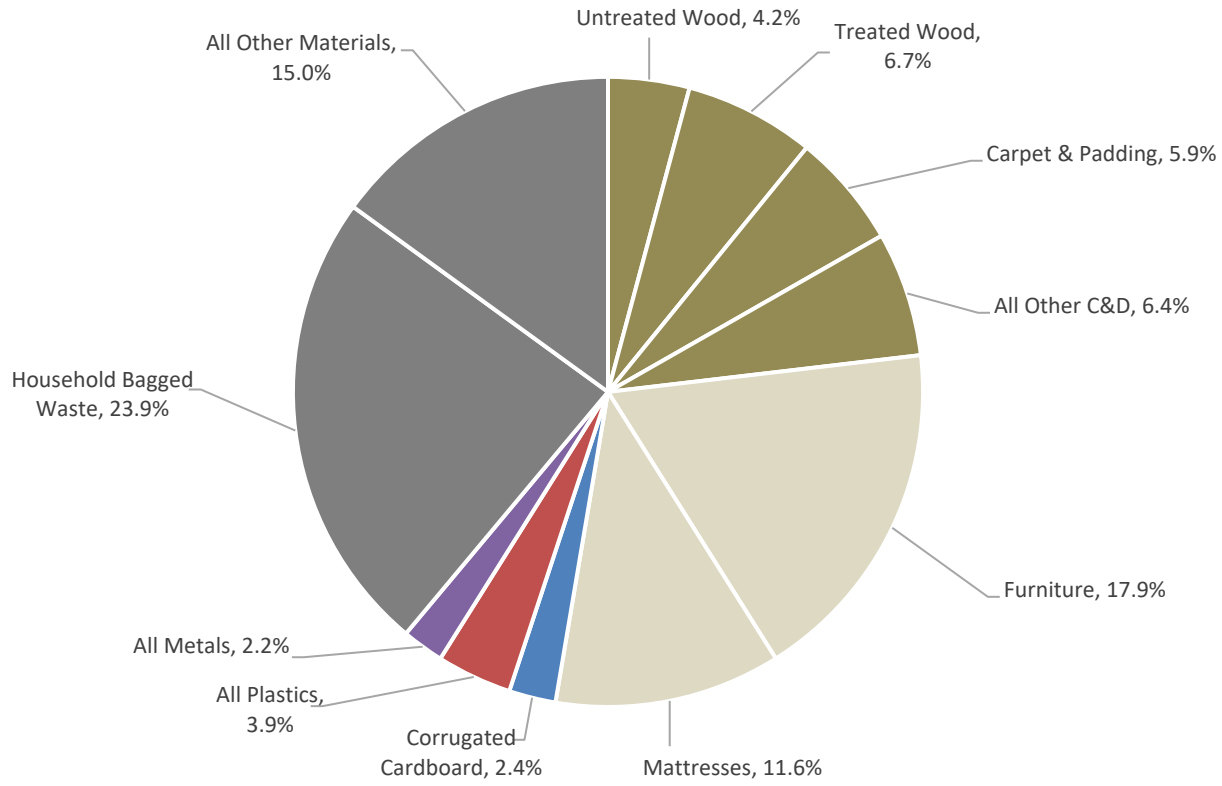


Table 3-3: Composition of Bulky Waste

Material Category	Weighted Average (% by volume)	90% Confidence Interval		Average Density (lbs/cy)*	Weighted Average (% by weight)
		Lower Bounds	Upper Bounds		
Untreated Wood	**2.9%**	-8.3%	14.1%	169	**4.2%**
Treated Wood	**4.6%**	2.1%	7.1%	169	**6.7%**
Carpet & Padding	**6.5%**	2.3%	10.7%	105	**5.9%**
Drywall	**0.0%**	0.0%	0.0%	467	**0.0%**
Roofing Shingles	**0.1%**	0.0%	0.3%	731	**0.8%**
Asphalt	**0.0%**	0.0%	0.0%	773	**0.0%**
Concrete	**0.1%**	-0.3%	0.4%	860	**0.5%**
Rock	**0.0%**	0.0%	0.0%	999	**0.0%**
Brick and Masonry	**0.0%**	0.0%	0.0%	860	**0.0%**
Fines and Grit	**0.0%**	0.0%	0.0%	929	**0.0%**
Fiberglass - insulation	**0.0%**	0.0%	0.0%	17	**0.0%**
Fiberglass - rigid	**0.0%**	0.0%	0.0%	50	**0.0%**
Tile/Porcelain	**0.1%**	-0.3%	0.5%	860	**0.8%**
Linoleum/Vinyl	**0.2%**	0.0%	0.3%	416	**0.5%**
Paned Glass	**1.2%**	0.5%	1.9%	380	**3.8%**
Bagged C&D Debris	**0.0%**	0.0%	0.0%	150	**0.0%**
Total C&D Debris	**15.6%**	**4.7%**	**26.5%**		**23.1%**
Furniture	**26.0%**	16.7%	35.3%	80	**17.9%**
Mattresses	**16.8%**	7.3%	26.4%	80	**11.6%**
Total Furniture	**42.8%**	**30.0%**	**55.7%**		**29.5%**
Corrugated Cardboard	**5.3%**	3.8%	6.7%	53	**2.4%**
Other Paper	**0.1%**	-0.1%	0.3%	323	**0.3%**
Total Paper	**5.4%**	**4.0%**	**6.8%**		**2.7%**
Film	**1.7%**	0.7%	2.8%	35	**0.5%**
Polystyrene Foam	**0.6%**	0.2%	1.0%	32	**0.2%**
PVC Pipe	**0.0%**	0.0%	0.0%	50	**0.0%**
Other Rigid Plastics	**7.4%**	3.8%	11.0%	50	**3.2%**
Total Plastics	**9.7%**	**5.4%**	**14.0%**		**3.9%**
Major Appliances	**0.0%**	0.0%	0.0%	145	**0.0%**
HVAC Ducting	**0.0%**	0.0%	0.0%	47	**0.0%**
Other Ferrous	**1.0%**	0.4%	1.5%	225	**1.9%**
Other Non-Ferrous	**0.1%**	-0.1%	0.4%	225	**0.3%**
Total Metal	**1.1%**	**0.4%**	**1.8%**		**2.2%**
Yard Waste	**0.5%**	-0.1%	1.1%	250	**1.2%**
Soil	**0.0%**	0.0%	0.0%	929	**0.0%**
Total Organics	**0.5%**	**-0.1%**	**1.1%**		**1.2%**
E-Waste	**0.3%**	-0.4%	1.0%	438	**1.1%**
Other Appliances	**1.8%**	0.0%	0.0%	438	**6.9%**
HHW	**0.0%**	0.0%	0.0%	1671	**0.0%**
Tires	**0.0%**	0.4%	2.9%	225	**0.0%**
Textiles	**1.7%**	1.4%	3.8%	150	**2.1%**
Mixed Residue	**2.6%**	0.0%	0.0%	150	**3.4%**
Bagged Household Garbage	**18.5%**	8.9%	28.0%	150	**23.9%**
Total Other Materials	**24.9%**	**3.9%**	**8.3%**		**37.5%**
Total	**100.0%**				**100.0%**

Note: Columns may not appear to calculate correctly due to rounding.

*Sources:

US EPA, Volume-to-Weight Conversion Factors. April 2016. https://www.epa.gov/sites/production/files/2016-04/documents/volume_to_weight_conversion_factors_memorandum_04192016_508fnl.pdf

California EPA: Integrated Waste Management Board, Targeted Statewide Waste Characterization Study: Detailed Characterization of Construction and Demolition Waste. June 2006. https://www2.calrecycle.ca.gov/Publications/Details/1185

Table 3-4: Comparison of Bulky Waste Composition to Previous WCSs

	2024		2021		2017		2014	
Material Category	**Weighted Average (% by vol.)**	**Weighted Average (% by wgt.)**	**Weighted Average (% by vol.)**	**Weighted Average (% by wgt.)**	**Weighted Average (% by vol.)**	**Weighted Average (% by wgt.)**	**Weighted Average (% by vol.)**	**Weighted Average (% by wgt.)**
Untreated Wood	2.9%	4.2%	2.1%	2.8%	8.0%	10.4%	11.6%	14.6%
Treated Wood	4.6%	6.7%	9.8%	12.9%	16.1%	20.8%	13.4%	16.9%
Carpet & Padding	6.5%	5.9%	4.5%	3.7%	4.2%	3.4%	13.6%	10.6%
Drywall	0.0%	0.0%	3.0%	11.0%	0.1%	0.4%	2.8%	9.8%
Roofing Shingles	0.1%	0.8%	0.1%	0.7%	0.5%	2.6%	0.0%	0.0%
Asphalt	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Concrete	0.1%	0.5%	0.0%	0.0%	0.0%	0.0%	0.6%	4.1%
Rock	0.0%	0.0%						
Brick and Masonry	0.0%	0.0%						
Fines and Grit	0.0%	0.0%						
Fiberglass - insulation	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Fiberglass - rigid	0.0%	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%	0.0%
Tile/Porcelain	0.1%	0.8%	1.2%	3.8%	2.0%	6.4%	0.0%	0.0%
Linoleum/Vinyl	0.2%	0.5%						
Paned Glass	1.2%	3.8%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Bagged C&D Debris	0.0%	0.0%	0.5%	0.6%	0.5%	0.6%	3.8%	4.3%
Total C&D Debris	**15.6%**	**23.1%**	**21.3%**	**35.5%**	**31.5%**	**44.6%**	**45.9%**	**60.3%**
Furniture	26.0%	17.9%	24.2%	15.1%	16.8%	10.3%	20.1%	11.9%
Mattresses	16.8%	11.6%	12.4%	7.8%	17.7%	10.9%	7.8%	4.6%
Total Furniture	**42.8%**	**29.5%**	**36.6%**	**22.9%**	**34.6%**	**21.2%**	**27.9%**	**16.6%**
Corrugated Cardboard	5.3%	2.4%	4.4%	1.8%	2.4%	1.0%	5.1%	2.0%
Other Paper	0.1%	0.3%	0.5%	1.2%	0.0%	0.0%	0.0%	0.0%
Total Paper	**5.4%**	**2.7%**	**4.8%**	**3.0%**	**2.4%**	**1.0%**	**5.1%**	**2.0%**
Film	1.7%	0.5%	1.0%	0.3%	0.0%	0.0%	0.0%	0.0%
Polystyrene Foam	0.6%	0.2%	1.9%	0.5%	0.0%	0.0%	0.3%	0.1%
PVC Pipe	0.0%	0.0%	0.2%	0.1%	0.0%	0.0%	0.0%	0.0%
Other Rigid Plastics	7.4%	3.2%	5.5%	2.2%	5.6%	2.1%	5.7%	2.1%
Total Plastics	**9.7%**	**3.9%**	**8.7%**	**3.0%**	**5.6%**	**2.2%**	**6.0%**	**2.2%**
Major Appliances	0.0%	0.0%	0.2%	0.3%	0.0%	0.0%	0.0%	0.0%
HVAC Ducting	0.0%	0.0%	0.0%	0.0%	0.6%	0.2%	0.0%	0.0%
Other Ferrous	1.0%	1.9%	1.1%	2.0%	2.9%	5.0%	0.3%	0.5%
Other Non-Ferrous	0.1%	0.3%	0.2%	0.4%	0.0%	0.0%	0.0%	0.0%
Total Metal	**1.1%**	**2.2%**	**1.6%**	**2.7%**	**3.5%**	**5.2%**	**0.3%**	**0.5%**
Yard Waste	0.5%	1.2%	0.0%	0.0%	0.0%	0.0%	0.3%	0.5%
Soil	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Total Organics	**0.5%**	**1.2%**	**0.0%**	**0.0%**	**0.0%**	**0.0%**	**0.3%**	**0.5%**
E-Waste	0.3%	1.1%	0.6%	2.0%	0.0%	0.0%	0.5%	1.7%
Other Appliances	1.8%	6.9%	n/a	n/a	n/a	n/a	n/a	n/a
HHW	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Tires	0.0%	0.0%	0.0%	0.0%	0.1%	0.2%	0.6%	1.0%
Textiles	1.7%	2.1%	0.8%	1.0%	0.8%	0.9%	1.5%	1.7%
Mixed Residue	2.6%	3.4%	3.7%	4.4%	0.0%	0.0%	0.8%	1.2%
Bagged Household Garbage	18.5%	23.9%	21.9%	25.7%	21.6%	24.8%	11.1%	12.4%
Total Other Materials	**24.9%**	**37.5%**	**27.0%**	**33.0%**	**22.5%**	**25.9%**	**14.5%**	**18.0%**
Total	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**

Note: Columns may not appear to calculate correctly due to rounding
Some categories were not separately measured in previous WCSs as indicated by merged cells or n/a.

Section 4
Findings

4.1 Introduction to Findings

To further assist the County in evaluating their waste composition and opportunities for additional material recovery, this section presents the following additional data analysis that KCI has not conducted in previous WCSs:

- Countywide waste composition,
- Comparison graphs for major material groups accepted for recycling by the County, and
- Material capture rates for Program Recyclables, Accepted C&D Debris, and Textiles.

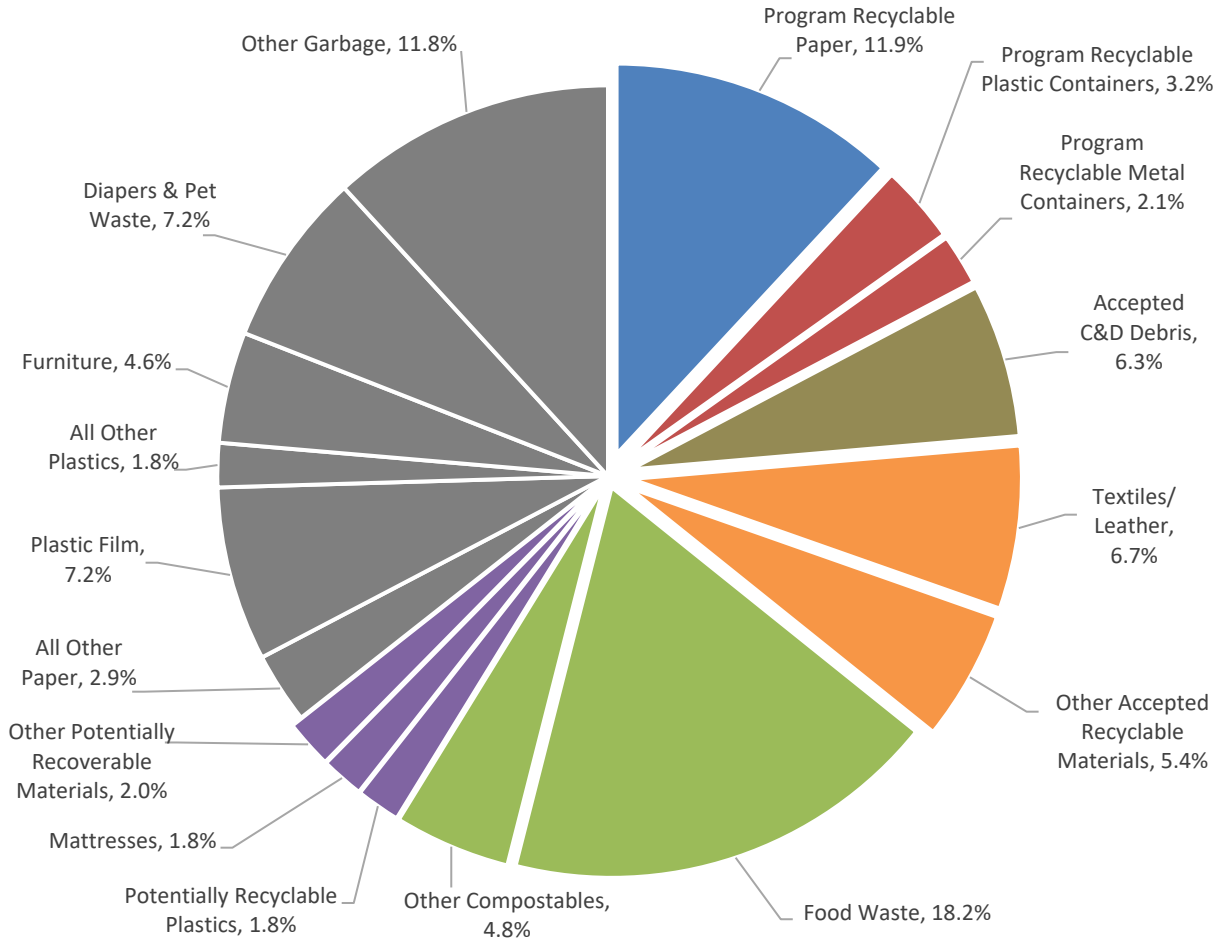
These additional analyses are then discussed in Subsection 4.5.

4.2 Countywide Waste Composition

To calculate the Countywide waste composition, annual generation data (April 2023-May 2024) for each of the three waste streams included in the WCS was applied to the respective waste stream composition and the results were then combined. Table 4-1 presents the composition for each stream based on the WCS results and the estimated Countywide composition. Figure 4-1 depicts the estimated Countywide composition. To facilitate combining the WCS data, the composition of the Bagged Household Waste in the bulky waste stream was assumed to be the same as the overall composition of the compactor waste stream (i.e., the percentage of Bagged Household Waste in the bulky waste stream was allocated to the various material categories based on the percentages of these materials in the compactor waste stream); therefore, the percentages shown in Table 4-1 for the bulky waste differ from those in Table 3-3.

Caution should be taken when interpreting this data. This is based on a snapshot of data from the 3-day WCS that KCI conducted with a limited number of pre-crusher samples and bulky waste that had a wide variability. Nevertheless, calculating the Countywide data gives the County a general idea of the total waste they are generating by factoring in the relative contribution of the three waste streams measured in the WCS.

Figure 4-1: Countywide Waste Composition



Note: For the purpose of this figure, the following categories have been combined:

- Program Recyclable Paper includes the categories of Corrugated Cardboard, Newspaper, Magazines and Catalogs, Mixed Recyclable Paper, and Aseptic/Polycoated Containers.
- Program Recyclable Plastic Containers includes the categories of PET Bottles (#1), HDPE Bottles (#2), Other Narrow-Neck Bottles, and Plastic Tubs.
- Program Recyclable Metal Containers includes the categories of Tin/Steel Cans, Aluminum Cans, and Nonhazardous Aerosol Cans.
- Accepted C&D Debris includes the categories of Carpet, Clean Wood Waste, Treated Wood Waste, and Other Accepted C&D Debris.
- Other Accepted Recyclable Materials includes the categories of Expanded Polystyrene Foam, Ferrous Scrap Metals, Aluminum Foil and Trays, Non-Ferrous Scrap Metals, Major Appliances, Glass Containers, Oil Filters, Lead-Acid Batteries, Computers, Televisions, Other E-Waste and Technotrash, Household Batteries, Pallets, Brick and Concrete, and Tires and Rubber.
- Other Compostables includes the categories of Compostable Paper and Yard Waste.
- Potentially Recyclable Plastics includes the categories of Plastic Drink Cups, Plastic Clamshells, Plastic Bottles That Held Toxics, Other Plastic Containers, and Bulky Rigid Plastics.
- Other Potentially Recoverable Materials includes the categories of Bagged Shredded Paper and Mattresses.
- Other Garbage includes the categories of Small Appliances, Other Glass, Other Special Wastes, Other Unaccepted C&D Debris, Composite Materials, Liquids, and Grit.

Table 4-1: Countywide Waste Composition

Material Category	Compactors	Pre-Crushers	Bulky	Countywide
Corrugated Cardboard	3.9%	4.4%	3.3%	**3.9%**
Newspaper	0.1%	0.0%	0.0%	**0.1%**
Magazines and Catalogs	1.5%	1.6%	0.4%	**1.3%**
Mixed Recyclable Paper	7.4%	6.2%	1.8%	**6.3%**
Aseptic/Polycoated Containers	0.3%	0.5%	0.1%	**0.3%**
Program Recyclable Paper	**13.2%**	**12.8%**	**5.6%**	**11.9%**
PET Bottles (#1)	2.6%	1.8%	0.6%	**2.2%**
HDPE Bottles (#2)	0.8%	0.4%	0.2%	**0.7%**
Other Narrow-Neck Bottles	0.1%	0.1%	0.0%	**0.1%**
Plastic Tubs	0.3%	0.5%	0.1%	**0.3%**
Tin/Steel Cans	1.5%	0.6%	0.4%	**1.2%**
Aluminum Cans	1.0%	0.7%	0.2%	**0.9%**
Nonhazardous Aerosol Cans	0.1%	0.0%	0.0%	**0.1%**
Program Recyclable Containers	**6.5%**	**4.2%**	**1.6%**	**5.4%**
Carpet & Padding	0.5%	1.8%	6.0%	**1.6%**
Clean Wood Waste	0.3%	0.7%	4.3%	**1.0%**
Treated Wood Waste	2.5%	1.5%	7.3%	**3.1%**
Other Accepted C&D Debris*	0.1%	1.9%	2.1%	**0.7%**
Accepted C&D Debris	**3.4%**	**5.9%**	**19.7%**	**6.3%**
Expanded Polystyrene Foam	1.3%	0.6%	0.5%	**1.1%**
Ferrous Scrap Metals	0.8%	0.3%	2.0%	**0.9%**
Aluminum Foil and Trays	0.7%	0.5%	0.2%	**0.5%**
Non-Ferrous Scrap Metals	0.2%	0.6%	0.3%	**0.3%**
Major Appliances			0.0%	**0.0%**
Glass Containers	1.3%	0.9%	0.3%	**1.1%**
Textiles/Leather	7.5%	6.2%	3.9%	**6.7%**
Oil Filters	0.0%	0.0%	0.0%	**0.0%**
Lead-Acid Batteries	0.0%	0.0%	0.0%	**0.0%**
Computers	0.0%	0.0%	0.0%	**0.0%**
Televisions	0.0%	0.0%	0.0%	**0.0%**
Other E-Waste and Technotrash	1.2%	1.5%	1.4%	**1.3%**
Household Batteries	0.1%	0.0%	0.0%	**0.1%**
Pallets	0.0%	0.0%	0.0%	**0.0%**
Brick and Concrete	0.0%	0.0%	0.5%	**0.1%**
Tires and Rubber	0.1%	0.0%	0.0%	**0.1%**
Other Accepted Recyclable Materials	**13.2%**	**10.6%**	**9.2%**	**12.1%**
Compostable Paper	4.5%	4.5%	1.1%	**4.0%**
Yard Waste	0.3%	2.9%	1.2%	**0.9%**
Food Waste	21.3%	17.6%	5.1%	**18.2%**
Potentially Compostable Materials	**26.0%**	**25.1%**	**7.4%**	**23.0%**

Note: Columns may not appear to calculate correctly due to rounding.
*Other Accepted C&D Debris included the categories of Drywall, Roofing Shingles, Fiberglass – Insulation, Tile/Porcelain, and Linoleum/Vinyl in the visual audits.

Table 4-1: Countywide Waste Composition (continued)

Material Category	Compactors	Pre-Crushers	Bulky	Countywide
Bagged Shredded Paper	0.5%	0.1%	0.1%	**0.4%**
Plastic Drink Cups	0.5%	0.8%	0.1%	**0.5%**
Plastic Clamshells	0.4%	0.4%	0.1%	**0.3%**
Plastic Bottles That Held Toxics	0.0%	0.0%	0.0%	**0.0%**
Other Plastic Containers	1.2%	0.7%	0.3%	**1.0%**
Bulky Rigid Plastics	1.3%	1.1%	3.5%	**1.6%**
Mattresses	0.0%	0.0%	11.6%	**1.8%**
Potentially Recoverable Materials	**3.9%**	**3.2%**	**15.7%**	**5.6%**
All Other Paper	3.4%	2.9%	1.1%	**2.9%**
Non-Rigid Plastic Film	8.2%	7.8%	2.5%	**7.2%**
All Other Plastics	2.1%	2.1%	0.5%	**1.8%**
Small Appliances	0.6%	0.0%	7.0%	**1.5%**
Other Glass	1.0%	1.1%	4.0%	**1.5%**
Other Special Wastes	0.3%	0.2%	0.1%	**0.3%**
Other Unaccepted C&D Debris	1.3%	2.5%	0.3%	**1.4%**
Furniture	1.2%	6.0%	18.2%	**4.6%**
Pet Waste	2.8%	4.8%	0.7%	**2.8%**
Diapers	5.5%	2.8%	1.3%	**4.4%**
Composite Materials	6.0%	4.6%	4.8%	**5.5%**
Liquids	0.7%	0.8%	0.2%	**0.6%**
Grit	0.8%	2.6%	0.2%	**1.0%**
All Other Materials	**33.8%**	**38.3%**	**40.9%**	**35.6%**
Total	**100.0%**	**100.0%**	**100.0%**	**100.0%**
Annual Tons	**7,933.66**	**1,990.97**	**1,799.76**	
Source Fraction	67.7%	17.0%	15.4%	

Note: Columns may not appear to calculate correctly due to rounding.

4.3 Recoverable Material Historical Comparison

KCI compared select major groups of materials currently accepted for recovery by the County from the 2014, 2017, 2021 and 2024 WCSs. Since previous WCSs did not calculate Countywide composition, this comparison is only done on specific waste streams where these materials are primarily generated. Figures 4-2 through 4-6 present the following comparisons, respectively:

- Program Recyclable Paper in compactor waste (% by weight),
- Program Recyclable Containers in compactor waste (% by weight),
- Accepted C&D Debris in bulky waste (% by volume),
- Textiles in compactor waste (% by weight)
- Glass Containers in compactor waste (% by weight), respectively.

Note: Error bars in these graphs represent the 90 percent confidence intervals of each average percentage. This allows for statistical comparison between the average percentages.

Figure 4-2: Comparison of Program Recyclable Paper in Compactor Waste (% by weight)

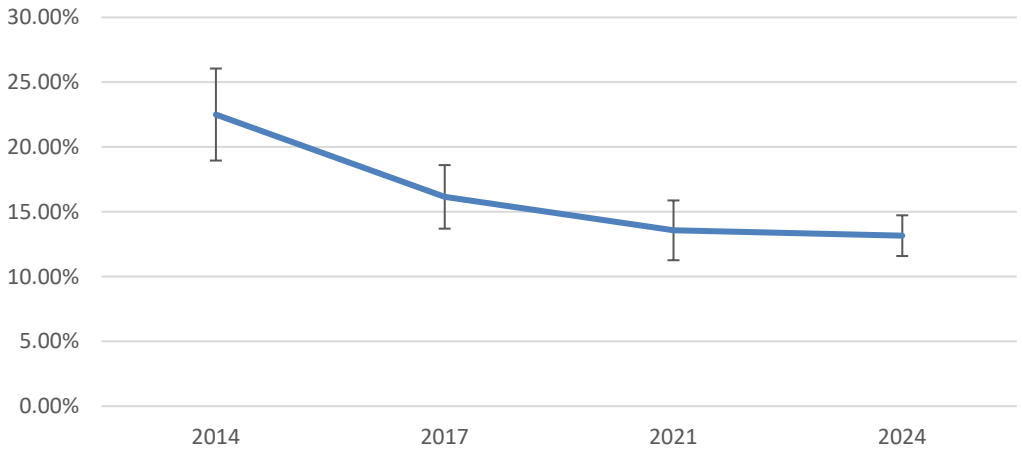


Figure 4-3: Comparison of Program Recyclable Containers in Compactor Waste (% by weight)

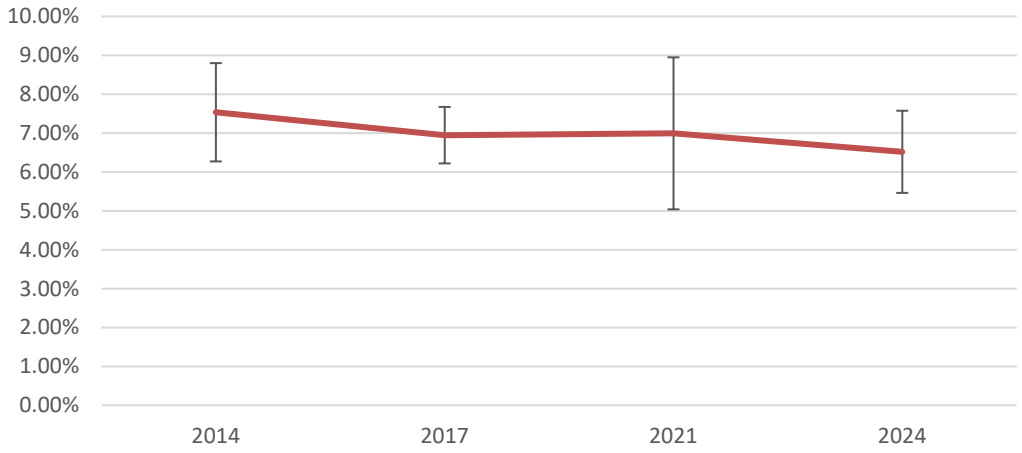


Figure 4-4: Comparison of Accepted C&D Debris in Bulky Waste (% by volume)

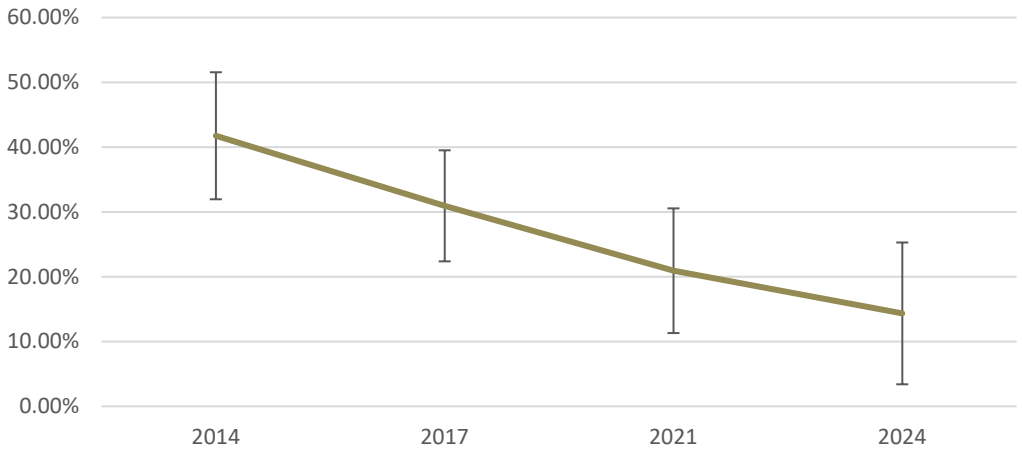


Figure 4-5: Comparison of Textiles in Compactor Waste (% by weight)

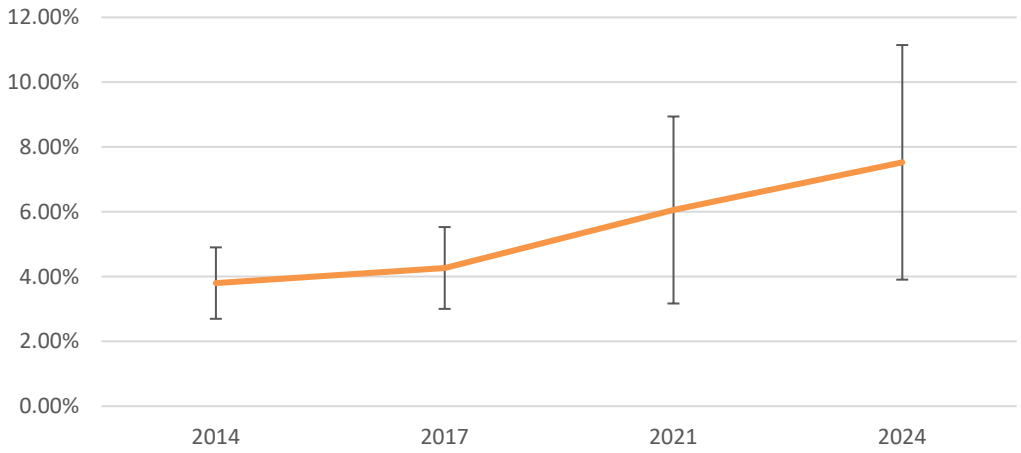
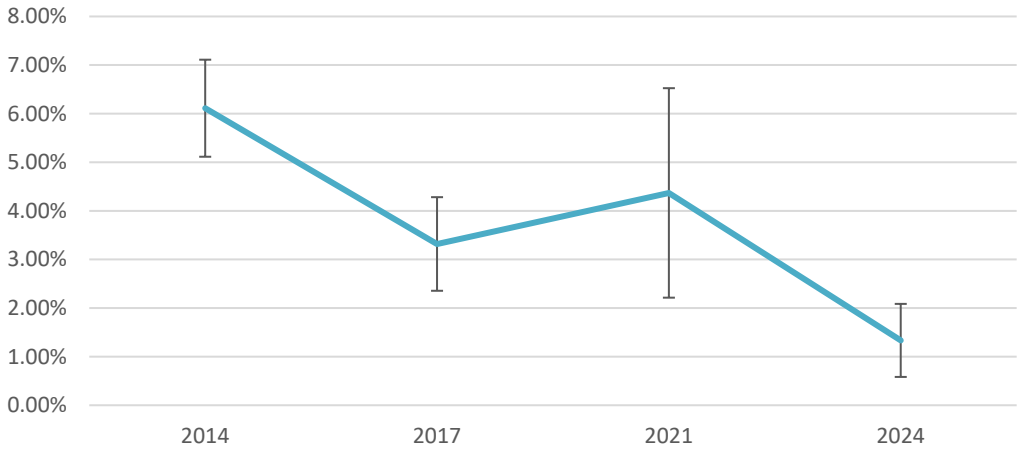


Figure 4-6: Comparison of Glass Containers in Compactor Waste (% by weight)



4.4 Material Capture Rate

As described in Section 2, KCI calculated the capture rate of Program Recyclables, Accepted C&D Debris, and Textiles using the annual tonnages (April 2023 – March 2024) for each material stream and applying the Countywide waste composition calculated in this WCS and the recyclables composition from the RCS that KCI conducted in 2023. Table 4-2 presents the following:

- Percentage of Program Recyclables by material category in the mixed recycling stream (based on the RCS) and the calculated tonnage based on applying these percentages to the annual tons of program recyclables collected (April 2023-March 2024). For Accepted C&D Debris and Textiles, the actual tonnage recycled during that period is provided.
- Percentage and annual tonnage of Program Recyclables by material category, Accepted C&D Debris, and Textiles in the Countywide waste stream, as calculated in Section 4.2 above.

- Total generation, calculated by adding the tons in the recycling stream and tons in the waste stream.
- Capture rate, which measures the percentage of the total generated material that is captured in the recycling stream.

Table 4-2: Material Capture Rate

	Recycling*		Waste**		Total Generation	Capture
	%	tons/year	%	tons/year	tons/year	%
Corrugated Cardboard	30%	327.1	4%	457.3	784.5	42%
Newspaper	2%	18.9	0%	10.0	28.8	65%
Magazines and Catalogs	16%	172.7	1%	156.3	329.0	52%
Mixed Recyclable Paper	21%	228.5	6%	740.3	968.9	24%
Aseptic/Polycoated Containers	1%	5.7	0%	34.1	39.8	14%
Program Recyclable Paper	**68%**	**752.9**	**12%**	**1,398.1**	**2,151.0**	**35%**
PET Bottles (#1)	7%	78.8	2%	254.8	333.6	24%
HDPE Bottles (#2)	3%	37.6	1%	78.6	116.2	32%
Other Narrow-Neck Bottles	0%	2.1	0%	12.1	14.2	15%
Plastic Tubs	1%	5.6	0%	35.4	41.0	14%
Tin/Steel Cans	4%	42.6	1%	137.6	180.2	24%
Aluminum Cans	4%	40.4	1%	99.8	140.2	29%
Nonhazardous Aerosol Cans	0%	0.8	0%	10.1	10.9	8%
Program Recyclable Containers	**19%**	**208.0**	**5%**	**628.4**	**836.4**	**25%**
Total Program Recyclables	**87%**	**961.0**	**17%**	**2,026.4**	**2,987.4**	**32%**
Accepted C&D Debris	**n/a**	**930.4**	**6%**	**744.1**	**1,674.6**	**56%**
Textiles	**n/a**	**39.2**	**7%**	**791.4**	**830.6**	**5%**

*Based on 1,108 tons of mixed recyclables collected from April 2023 to March 2024.
**Based on 11,724 tons of waste (compactor, pre-crusher, and bulky waste) collected from April 2023 to March 2024.

4.5 Discussion

As stated above, this WCS represents a snapshot of the County's waste. Despite the limited number of pre-crusher waste samples and the wide variability of bulky waste, some general conclusions and trends can be derived from the results of the WCS.

Approximately a third of the County's disposed waste consists of materials that are currently accepted by the County for recycling and another third are materials that that could potentially be recovered in new or expanded recovery programs should markets and/or infrastructure become available. Below are some of the major findings and waste diversion opportunities from the data gathered and analyzed in this WCS.

Program Recyclables

- Less than 20 percent of the waste consists of materials that are currently accepted in the County's mixed recycling stream. This is mostly Corrugated Cardboard and Mixed Recyclable Paper. While most of this material was found in the compactor and pre-

crusher waste, nearly every load of bulky waste included measurable Corrugated Cardboard.

- As shown in Figure 4-2, the percentage of Program Recyclable Paper in the waste stream has been trending downward since 2014. However, as shown in Figure 4-3, the percentage of Program Recyclable Containers has remained fairly constant (although the average has shown a slight decrease, the confidence intervals overlap).
- Program Recyclables had an estimated overall capture rate of approximately 30 percent. This is a lower percentage than the capture rates KCI has measured in other studies of residential curbside programs (ranging from roughly 50 to 75 percent); however, this capture rate is not unusual for a drop-off program like that in Chatham County.
- Continuing with education and outreach could help increase the capture rate. The County may also consider an incentive program, such as rewarding residents for bringing segregated recyclables to the collection center. While it is often difficult to enforce recyclable separation, especially if it is bagged, the attendant could remind residents if they do notice them placing recyclables in the compactors. This could be especially helpful for keeping loose cardboard out of the bulky waste containers since it is easier to see than bagged material.

Accepted C&D Debris

- About 6 percent of the Countywide waste was C&D Debris that is accepted in the County's C&D recycling program. Bulky waste had a much higher percentage of C&D Debris than the compactor or pre-crusher waste.
- The percentage of Accepted C&D Debris in the bulky waste stream (Figure 4-4) has decreased substantially since 2014. This can be attributed to the C&D debris recycling program the County launched following the 2017 WCS and then expanded after the 2021 WCS.
- The C&D recycling program appears to be capturing over 50 percent of the Accepted C&D Debris that is generated, which indicates the C&D recycling program is showing success but still has room to improve.
- The County's bulky waste had noticeably less C&D Debris than the bulky waste at other communities for which KCI has conducted visual audits. However, some loads had a much higher percentage of Accepted C&D Debris than others, particularly Cole Park, Harper's Crossroads and Asbury. Staff at the centers could help to prevent these materials from getting into the bulky containers by directing residents to place them in the C&D Debris containers for recycling. Additional audits would be needed to see if these were one-off occurrences or if some centers more regularly had C&D Debris in their bulky containers than others.

Textiles

- Textiles had one of the higher percentages of materials currently accepted for recycling by the County, at about 7 percent of the stream.
- While the average percentage of Textiles in the compactor waste has increased (Figure 4-5), the variability in the percentage of textiles between samples has also increased so that the confidence interval in 2024 overlaps with all previous years. In the 2024 WCS,

KCI noted full bags of clothes and other textiles in some samples, which significantly increased the percentage of textiles in those samples. For example, the Bonlee sample and Haper's Crossroads sample were 16.0 and 25.8 percent Textiles, respectively.

- While the County currently accepts Textiles for recycling through its Green Zone program, the program is only capturing about 5 percent of the Textiles generated. It should be noted that not all textiles measured in the WCS would be accepted in the program, such as bedding. These were not separately sorted in the WCS, but future WCSs could distinguish between accepted and non-accepted Textiles.
- Clean, gently used clothing and shoes would also be accepted at the County's Swap Shop. Some of the clothing found in the WCS samples could qualify for this.
- Attendants at the sites could remind residents of the Green Zone and Swap Shop programs, especially if they are observed throwing full bags of Textiles into the compactor.

Glass Containers

- About 1 percent of the compactor waste steam is Glass Containers. This is a substantial decrease since 2014 when the compactor waste was about 6 percent Glass Containers.
- Glass containers are not accepted in the County's mixed recycling stream but are separately collected at all collection centers. It appears that residents are making use of these since Glass Containers were minimal in the waste stream and only about 4 percent of the mixed recycling stream, as measured in the 2023 RCS (data not shown).

Food Waste

- Food Waste is the largest individual material category in the waste stream, at nearly 20 percent. This presents the biggest opportunity for additional diversion for the County.
- KCI could assist the County in evaluating the feasibility of implementing an organics diversion program and what it could potentially look like for the County.

4.6 Conclusions

This WCS is the fourth such study that KCI has conducted for the County over a 10-year period. These regular WCSs provide valuable data to the County to not only measure changes in their waste stream but to also track the progress of its recycling efforts. As mentioned above, the trends in the data indicate increased diversion of recoverable materials from the waste stream over the past decade, with opportunities for additional improvements and potential expansion into materials such as organics. These WCSs allow the County to make informed decisions on its collection and recycling programs.

KCI appreciates the opportunity to once again work with the County in their ongoing efforts to understand their waste streams and increase waste diversion and recycling. We look forward to assisting the County again in the future.

Appendix A:
Chatham County
2024 Waste Composition Study
Hand-Sort Material Categories

#	Material Categories	Description of Categories
1	**Corrugated Cardboard**	Uncoated cardboard boxes with a wavy core (no plastic liners, waxy coatings). Examples include shipping and moving boxes, packing boxes, and clean pizza boxes.
2	**Newspaper**	Newspaper (loose or tied) including other paper normally distributed inside newspaper such as ads, flyers, etc. and other items made from newsprint such as advertising guides. Newspaper found inside plastic sleeves will be removed from plastic and sorted accordingly.
3	**Magazines and Catalogs**	All magazines and catalogs, including glossy magazines.
4	**Mixed Recyclable Paper**	Printed or unprinted recyclable paper including white, colored, coated and uncoated papers, envelopes, index cards, file folders, telephone books, paperboard, chipboard, Kraft paper, brown paper bags, mail, paperback books, blueprints, and other printed material on glossy and non-glossy paper. *Does not include shredded, contaminated, waxy, or metallic paper.*
5	**Bagged Shredded Paper**	Shredded paper in paper or plastic bags. Any loose shredded paper will be included in compostable paper.
6	**Compostable Paper**	Generally, low-grade, non-recyclable paper without a heavy plastic coating, including napkins, tissues, paper towels, and uncoated paper plates. Includes food-contaminated paper.
7	**All Other Paper**	Non-compostable, non-recyclable paper products with a heavy plastic coating (e.g., waxy or plastic-coated corrugated cardboard, paper to-go cups, french fry containers, coated paper plates, fast-food wrappers, wax and parchment paper, and ice cream tubs). Includes paper covered with paint or other non-food contamination.
8	**Aseptic/Polycoated Containers**	Gable-top cartons, aseptic juice boxes, and other similar containers made of coated paperboard. *Does not include plastic drink pouches (e.g., Capri-Suns™).*
9	**PET Bottles (#1)**	Clear and colored bottles and jars made of polyethylene terephthalate (PET #1). Examples include soda bottles, water bottles, etc. *Does not include loose caps.*
10	**HDPE Bottles (#2)**	Clear/natural and pigmented plastic bottles made of high-density polyethylene (HDPE #2) such as milk jugs, vinegar bottles, and detergent bottles. *Does not include loose caps.*
11	**Other Narrow-Neck Bottles**	All narrow-neck plastic containers coded #3-#7, such as vitamin bottles, Arizona Iced Tea™ gallon jugs, etc. *Does not include loose caps.*
12	**Plastic Tubs**	Wide-mouthed tubs with a lid that can be replaced, including lids, regardless of plastic type. Examples include coffee tubs, yogurt tubs, margarine tubs, sour cream tubs, and humus tubs.
13	**Plastic Drink Cups**	All plastic drink cups, regardless of plastic type.
14	**Plastic Clamshells**	All plastic clamshell containers with a hinged lid, regardless of plastic type. *Does not include expanded polystyrene clamshells.*
15	**Plastic Bottles That Held Toxics**	Empty pesticide, oil, and other bottles that held toxic or hazardous chemicals. *Filled containers will be placed into Other Special Wastes.*
16	**Other Plastic Containers**	All other plastic containers that are not bottles, tubs, drink cups, and clamshells. Examples include fruit or vegetable platters, small yogurt cups with foil lid, and frozen food trays.

#	Material Categories	Description of Categories
17	**Bulky Rigid Plastics**	Non-container, large rigid plastic items, such as plastic drums, crates, toys, buckets, baskets, laundry baskets, lawn furniture, flowerpots, and other large plastic items. *Does not include electronic or electric toys, or bulky items consisting of mixed material.*
18	**Expanded Polystyrene Foam (Styrofoam®)**	Container and non-container materials made of expanded polystyrene beads, which are typically white but may be pigmented. Examples include coolers, packaging materials, egg cartons, clamshell containers, and disposable cups and plates.
19	**Non-Rigid Plastic Film**	Loose and bagged plastic retail bags, garbage bags, shrink wrap, re-sealable bags, plastic sheeting, Saran™ wrap, visqueen, etc. Also includes disposable gloves. *Does not include foil-lined plastic film (e.g., chip bags).*
20	**All Other Plastics**	Any plastic materials not categorized above, such as deodorant cases, plastic utensils, straws, toothbrushes, broom heads, polypropylene foam products, etc.
21	**Tin/Steel Cans**	Tin-plated steel cans, usually food containers and aerosol cans, including labels. Also includes steel caps and lids.
22	**Ferrous Scrap Metals**	Non-container ferrous (magnetic) metal materials. Examples include clothes hangers, sheet metal products, pipes, miscellaneous metal scraps, pots and pans, and other magnetic metal items.
23	**Aluminum Cans**	Aluminum soft drink, beer, and some food and aerosol cans.
24	**Aluminum Foil and Trays**	Aluminum foil and food trays, such as disposable pie plates and catering trays.
25	**Nonhazardous Aerosol Cans**	Empty aerosol cans, of aluminum or steel, that contained nonhazardous materials, such as whipped cream or shaving cream. Empty or full aerosol containers with hazardous materials, such as spray paint, will be placed in Other Special Wastes.
26	**Non-Ferrous Scrap Metals**	Non-container, non-ferrous (non-magnetic) metal materials. Examples include aluminum pots and pans, aluminum siding, copper wiring and tubing, and brass fixtures.
27	**Small Appliances**	Household appliances primarily composed of mixed materials (plastic, metal and glass), such as coffee makers, microwaves, fans, irons, hair dryers, electrical kitchen ware, and salvageable items such as machinery.
28	**Glass Containers**	Clear, green, blue, and amber glass bottles and jars, as well as pieces of broken glass bottles and jars.
29	**Other Glass**	Windowpanes, mirrors, ceramics, drinking glasses, and glass containers other than clear, green, blue, or amber.
30	**Textiles**	Clothing apparel, rags, leather, blankets, curtains, shoes, wallets, purses, belts, and scrap leather.
31	**Carpet**	Carpet and padding.
32	**Oil Filters**	Oil Filters.
33	**Lead-Acid Batteries**	Lead-Acid Batteries.
34	**Other Special Wastes**	Cleaners, oil, paint, pesticides, pool chemicals, fluorescent lights, medical waste, solvents, rechargeable batteries, etc., that are considered household hazardous waste (HHW). *Does not include syringes without needles.*

#	Material Categories	Description of Categories
35	**Computers**	Computers, monitors, printers, scanners and peripherals.
36	**Televisions**	Televisions of all sizes and types.
37	**Other E-Waste and Technotrash**	Electronic devices such as DVD players, VCRs, cell phones, cordless telephones, PDAs, handheld devices, rechargeable batteries, as well as media items such as CDs, DVDs, tapes, etc.
38	**Household Batteries**	Non-rechargeable household batteries including AA, AAA, C, D, 9-volt, and button types.
39	**Clean Wood Waste**	Untreated and unpainted lumber and dimensional lumber.
40	**Treated Wood Waste**	Treated and painted wood and dimensional lumber. Also includes engineered wood such as plywood, particle board, oriented strand board, fiberboard, and laminate.
41	**Pallets**	Pallets and pallet pieces.
42	**Brick and Concrete**	Brick and concrete of all sizes.
43	**Other Accepted C&D Debris**	Other construction and demolition debris accepted in the County's C&D debris recycling program, including cabinets, counter tops, doors, flooring, drywall, insulation, plumbing fixtures, PVC pipe, shingles, siding, tiles, and windows.
44	**Other Unaccepted C&D Debris**	All other construction and demolition debris not listed above.
45	**Furniture**	Metal, wood, and composite furniture, in whole or in part.
46	**Mattresses**	Mattresses and box springs.
47	**Tires and Rubber**	Small and large tires and other items made of rubber.
48	**Yard Waste**	Shrub and brush prunings, household bedding plants, weeds, leaves, grass clippings, and other landscaping and gardening wastes. Includes planting media (soil, compost, peat moss, etc.).
49	**Food Waste**	Packaged or loose meat and vegetable waste (includes coffee grounds and tea bags). Includes single-use coffee pods (i.e., K-cups®).
50	**Pet Waste**	Cat litter, feces, hair.
51	**Diapers**	All child and adult diapers and incontinence aids. Includes feminine hygiene products.
52	**Composite Materials**	Products that are a composite of materials such as cigarette packages, binders, laminated paper, electrical devices and accessories other than e-waste or small appliances, extension cords, string lights, Pringle's® cans, chip bags, etc.
53	**Liquids**	All liquids found within containers. Containers will be sorted into their appropriate category.
54	**Grit**	Any grit or fines remaining on the sort table that cannot be defined in the other categories.

Appendix B:
Chatham County
2024 Waste Composition Study
Visual Audit Material Categories

Class	Material Category
Paper	Corrugated Cardboard
	Other Paper
Plastic	Film
	Polystyrene Foam
	PVC Pipe
	Other Rigid Plastics
Metal	Major Appliances
	HVAC Duct
	Other Ferrous
	Other Non-Ferrous
Organics	Yard Waste
	Soil
Construction and Demolition Debris	Untreated Wood
	Treated Wood
	Carpet & Padding
	Drywall
	Roofing Shingles
	Concrete
	Asphalt
	Rock
	Brick and Masonry
	Fines and Grit
	Fiberglass - insulation
	Fiberglass - rigid
	Tile/Porcelain
	Linoleum/Vinyl
	Paned Glass
Furniture	Furniture
	Mattresses
Bagged Waste	Household Garbage
	C&D Debris

Class	Material Category
Other	E-Waste
	Other Appliances
	HHW
	Tires
	Textiles
	Mixed Residue/Loose MSW

Appendix C:
Chatham County
2024 Waste Composition Study
Individual Sample Results

Table C-1: Compactor Sample Results (% by weight)

	Location	Pittsboro	Cole Park	Crutchfield Crossroads	Bonlee	Martha's Chapel	Goldston
	Material Categories sample #	**1**	**2**	**3**	**4**	**7**	**8**
1	Corrugated Cardboard	8.5%	3.4%	2.8%	3.9%	5.3%	2.0%
2	Newspaper	0.0%	0.1%	0.5%	0.0%	0.0%	0.0%
3	Magazines and Catalogs	3.0%	1.7%	0.1%	3.8%	1.3%	2.5%
4	Mixed Recyclable Paper	6.1%	5.4%	6.9%	9.7%	7.0%	8.1%
5	Bagged Shredded Paper	0.0%	0.0%	0.0%	0.0%	0.0%	4.5%
6	Compostable Paper	3.8%	7.1%	4.2%	4.5%	3.8%	3.6%
7	All Other Paper	1.3%	2.9%	7.1%	2.4%	5.2%	3.7%
8	Aseptic/Polycoated Containers	0.4%	0.5%	0.2%	0.2%	0.3%	0.6%
9	PET Bottles (#1)	2.5%	1.5%	5.7%	2.5%	2.5%	3.0%
10	HDPE Bottles (#2)	0.9%	1.0%	0.9%	1.0%	0.2%	1.1%
11	Other Narrow-Neck Bottles	0.0%	0.1%	0.0%	0.1%	0.1%	0.2%
12	Plastic Tubs	0.2%	0.5%	0.5%	0.0%	0.1%	0.6%
13	Plastic Drink Cups	0.3%	0.4%	2.2%	0.5%	0.2%	0.2%
14	Plastic Clamshells	0.3%	0.5%	0.1%	0.5%	0.1%	0.9%
15	Plastic Bottles That Held Toxics	0.0%	0.0%	0.0%	0.0%	0.1%	0.0%
16	Other Plastic Containers	0.9%	2.1%	0.7%	0.7%	1.2%	2.1%
17	Bulky Rigid Plastics	0.0%	4.6%	0.3%	0.0%	0.0%	0.7%
18	Expanded Polystyrene Foam	1.1%	1.5%	1.6%	2.1%	1.1%	1.2%
19	Non-Rigid Plastic Film	8.4%	6.9%	11.9%	9.3%	9.9%	8.3%
20	All Other Plastics	5.7%	1.4%	3.3%	2.1%	1.3%	0.9%
21	Tin/Steel Cans	0.3%	0.7%	1.0%	4.1%	1.3%	1.5%
22	Ferrous Scrap Metals	0.4%	0.2%	0.7%	0.7%	0.7%	0.3%
23	Aluminum Cans	1.1%	0.6%	1.0%	2.7%	0.5%	1.3%
24	Aluminum Foil and Trays	0.4%	0.2%	2.5%	0.9%	0.5%	0.6%
25	Nonhazardous Aerosol Cans	0.0%	0.1%	0.0%	0.0%	0.0%	0.2%
26	Non-Ferrous Scrap Metals	0.0%	0.0%	1.3%	0.0%	0.4%	0.0%
27	Small Appliances	3.2%	0.0%	2.5%	0.0%	0.0%	0.0%
28	Glass Containers	0.9%	0.8%	1.1%	0.0%	1.1%	3.7%
29	Other Glass	0.5%	3.3%	0.5%	0.0%	1.1%	0.6%
30	Textiles	8.0%	6.8%	5.7%	16.0%	3.5%	0.6%
31	Carpet	1.8%	0.0%	0.0%	0.0%	0.0%	0.0%
32	Oil Filters	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
33	Lead-Acid Batteries	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
34	Other Special Wastes	1.4%	0.0%	0.0%	0.0%	0.8%	0.0%
35	Computers	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
36	Televisions	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
37	Other E-Waste and Technotrash	1.2%	3.3%	0.3%	0.4%	1.0%	0.0%
38	Household Batteries	0.2%	0.0%	0.1%	0.1%	0.1%	0.0%
39	Clean Wood Waste	0.6%	0.0%	0.0%	0.0%	0.8%	0.0%
40	Treated Wood Waste	0.0%	8.0%	0.4%	0.0%	0.9%	0.0%
41	Pallets	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
42	Brick and Concrete	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
43	Other Accepted C&D Debris	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
44	Other Unaccepted C&D Debris	3.4%	0.0%	0.0%	0.0%	12.5%	0.0%
45	Furniture	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
46	Mattresses	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
47	Tires and Rubber	0.2%	0.0%	0.7%	0.0%	0.0%	0.0%
48	Yard Waste	0.0%	0.2%	0.1%	1.2%	0.0%	0.0%
49	Food Waste	24.1%	17.7%	19.1%	12.0%	17.6%	29.9%
50	Pet Waste	0.4%	3.8%	0.0%	0.0%	9.5%	0.0%
51	Diapers	2.7%	0.0%	10.4%	11.3%	4.5%	11.4%
52	Composite Materials	5.9%	9.2%	1.8%	7.3%	3.4%	3.5%
53	Liquids	0.0%	0.0%	1.8%	0.0%	0.0%	0.0%
54	Grit	0.0%	3.3%	0.0%	0.0%	0.0%	2.0%
	TOTALS	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**
	Annual Tons	**1,111.26**	**1,145.92**	**570.46**	**799.25**	**529.37**	**525.55**

Note: Columns may not appear to calculate correctly due to rounding

Table C-1: Compactor Sample Results (% by weight) - continued

	Location	Moncure	Siler City	Bennett	Asbury	Hadley	Harper's Crossroads
	Material Categories sample #	**9**	**10**	**13**	**14**	**15**	**16**
1	Corrugated Cardboard	2.5%	0.5%	3.0%	2.0%	4.7%	8.6%
2	Newspaper	0.1%	0.3%	0.0%	0.0%	0.0%	0.3%
3	Magazines and Catalogs	0.8%	0.0%	1.6%	0.7%	0.5%	0.2%
4	Mixed Recyclable Paper	7.6%	11.3%	5.5%	5.6%	4.9%	6.1%
5	Bagged Shredded Paper	0.1%	0.0%	0.0%	0.4%	2.4%	0.0%
6	Compostable Paper	8.4%	2.6%	5.8%	1.8%	4.7%	3.9%
7	All Other Paper	2.9%	5.7%	2.7%	1.1%	2.1%	2.0%
8	Aseptic/Polycoated Containers	0.1%	0.2%	0.1%	0.0%	0.4%	0.2%
9	PET Bottles (#1)	2.0%	3.0%	2.9%	1.7%	2.5%	2.2%
10	HDPE Bottles (#2)	0.2%	0.6%	1.6%	0.6%	0.9%	1.3%
11	Other Narrow-Neck Bottles	0.1%	0.1%	0.2%	0.1%	0.3%	0.0%
12	Plastic Tubs	0.4%	0.3%	0.2%	0.1%	0.4%	0.1%
13	Plastic Drink Cups	0.8%	0.3%	0.3%	0.0%	0.4%	0.5%
14	Plastic Clamshells	0.8%	0.2%	0.6%	0.1%	0.3%	0.2%
15	Plastic Bottles That Held Toxics	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%
16	Other Plastic Containers	1.5%	0.9%	1.4%	0.8%	1.3%	0.8%
17	Bulky Rigid Plastics	2.1%	0.1%	1.1%	7.7%	0.0%	0.7%
18	Expanded Polystyrene Foam	1.4%	1.2%	1.2%	1.1%	0.6%	1.3%
19	Non-Rigid Plastic Film	9.1%	7.1%	7.6%	6.5%	7.1%	6.2%
20	All Other Plastics	0.7%	0.5%	1.4%	2.1%	1.1%	1.9%
21	Tin/Steel Cans	1.0%	3.3%	0.6%	0.7%	0.3%	1.0%
22	Ferrous Scrap Metals	1.1%	2.5%	0.1%	0.6%	0.4%	0.0%
23	Aluminum Cans	1.4%	0.5%	2.0%	0.7%	0.5%	0.6%
24	Aluminum Foil and Trays	0.7%	0.4%	1.5%	0.3%	0.8%	0.3%
25	Nonhazardous Aerosol Cans	0.1%	0.2%	0.0%	0.0%	0.7%	0.1%
26	Non-Ferrous Scrap Metals	0.0%	0.0%	0.0%	0.7%	0.0%	0.5%
27	Small Appliances	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
28	Glass Containers	2.8%	1.1%	3.4%	0.2%	3.8%	0.0%
29	Other Glass	0.2%	0.0%	0.0%	3.3%	1.0%	0.8%
30	Textiles	1.8%	6.9%	7.1%	3.9%	3.4%	25.8%
31	Carpet	0.0%	1.8%	0.0%	0.0%	0.0%	0.0%
32	Oil Filters	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
33	Lead-Acid Batteries	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
34	Other Special Wastes	0.8%	0.0%	0.0%	0.0%	0.0%	0.1%
35	Computers	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
36	Televisions	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
37	Other E-Waste and Technotrash	0.0%	2.1%	0.1%	1.5%	0.0%	0.4%
38	Household Batteries	0.1%	0.1%	0.1%	0.0%	0.0%	0.0%
39	Clean Wood Waste	2.6%	0.0%	0.0%	0.5%	0.3%	0.0%
40	Treated Wood Waste	0.0%	5.6%	0.7%	3.3%	3.0%	0.5%
41	Pallets	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
42	Brick and Concrete	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
43	Other Accepted C&D Debris	0.0%	0.3%	0.0%	0.0%	0.0%	0.0%
44	Other Unaccepted C&D Debris	0.0%	0.0%	0.0%	0.8%	0.0%	0.0%
45	Furniture	0.0%	0.0%	0.0%	16.5%	4.9%	0.0%
46	Mattresses	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
47	Tires and Rubber	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
48	Yard Waste	0.1%	0.2%	0.2%	0.5%	0.9%	0.0%
49	Food Waste	29.1%	20.0%	28.4%	18.8%	27.5%	24.4%
50	Pet Waste	0.0%	5.4%	1.5%	7.3%	4.3%	0.8%
51	Diapers	2.3%	5.8%	9.6%	0.0%	9.5%	5.3%
52	Composite Materials	12.6%	7.2%	3.2%	4.7%	2.8%	2.3%
53	Liquids	1.5%	1.5%	2.2%	0.9%	1.3%	0.7%
54	Grit	0.0%	0.0%	1.9%	2.1%	0.0%	0.0%
	TOTALS	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**
	Annual Tons	**464.10**	**1,230.45**	**261.97**	**412.62**	**478.36**	**404.35**

Note: Columns may not appear to calculate correctly due to rounding

Table C-2: Pre-Crusher Sample Results (% by weight)

	Location	Cole Park	Cole Park	Pittsboro	Pittsboro
	Material Categories sample #	**5**	**6**	**11**	**12**
1	Corrugated Cardboard	12.0%	2.8%	1.1%	0.6%
2	Newspaper	0.1%	0.0%	0.0%	0.0%
3	Magazines and Catalogs	0.1%	2.0%	1.9%	2.9%
3	Mixed Recyclable Paper	9.6%	3.1%	4.7%	7.2%
4	Bagged Shredded Paper	0.0%	0.0%	0.6%	0.0%
5	Compostable Paper	4.8%	4.7%	1.8%	6.9%
6	All Other Paper	3.4%	3.5%	3.1%	1.3%
7	Aseptic/Polycoated Containers	0.5%	0.4%	0.5%	0.7%
8	PET Bottles (#1)	1.9%	0.9%	1.4%	3.2%
9	HDPE Bottles (#2)	0.6%	0.5%	0.4%	0.1%
10	Other Narrow-Neck Bottles	0.3%	0.1%	0.1%	0.0%
11	Plastic Tubs	0.5%	0.8%	0.3%	0.4%
12	Plastic Drink Cups	0.4%	1.5%	0.8%	0.5%
13	Plastic Clamshells	0.6%	0.6%	0.2%	0.1%
14	Plastic Bottles That Held Toxics	0.1%	0.0%	0.0%	0.1%
15	Other Plastic Containers	0.7%	1.1%	0.8%	0.2%
16	Bulky Rigid Plastics	2.2%	0.8%	0.0%	1.3%
17	Expanded Polystyrene Foam	1.2%	0.8%	0.3%	0.2%
18	Non-Rigid Plastic Film	9.0%	9.7%	6.3%	5.3%
19	All Other Plastics	3.0%	1.6%	3.2%	0.5%
20	Tin/Steel Cans	0.6%	0.7%	0.3%	0.7%
21	Ferrous Scrap Metals	0.0%	0.5%	0.9%	0.0%
22	Aluminum Cans	0.8%	0.6%	0.5%	0.9%
23	Aluminum Foil and Trays	1.0%	0.4%	0.1%	0.3%
24	Nonhazardous Aerosol Cans	0.0%	0.0%	0.0%	0.1%
25	Non-Ferrous Scrap Metals	0.1%	1.9%	0.0%	0.3%
26	Small Appliances	0.0%	0.0%	0.0%	0.0%
27	Glass Containers	1.4%	0.8%	0.6%	0.6%
28	Other Glass	0.6%	3.3%	0.0%	0.0%
29	Textiles	2.7%	8.2%	9.1%	5.1%
30	Carpet	0.0%	0.1%	1.7%	6.1%
31	Oil Filters	0.0%	0.0%	0.0%	0.0%
32	Lead-Acid Batteries	0.0%	0.0%	0.0%	0.0%
33	Other Special Wastes	0.8%	0.0%	0.0%	0.0%
34	Computers	0.0%	0.0%	0.0%	0.0%
35	Televisions	0.0%	0.0%	0.0%	0.0%
36	Other E-Waste and Technotrash	0.1%	0.2%	2.6%	3.5%
37	Household Batteries	0.0%	0.0%	0.0%	0.0%
38	Clean Wood Waste	0.6%	0.1%	2.2%	0.2%
39	Treated Wood Waste	1.9%	2.3%	1.6%	0.2%
40	Pallets	0.0%	0.0%	0.0%	0.0%
41	Brick and Concrete	0.0%	0.0%	0.0%	0.0%
42	Other Accepted C&D Debris	0.0%	0.3%	0.0%	7.8%
43	Other Unaccepted C&D Debris	0.0%	0.6%	0.0%	10.5%
44	Furniture	0.0%	1.4%	14.8%	10.0%
45	Mattresses	0.0%	0.0%	0.0%	0.0%
46	Tires and Rubber	0.0%	0.0%	0.0%	0.0%
47	Yard Waste	3.6%	1.8%	0.0%	6.2%
48	Food Waste	20.8%	20.9%	20.4%	7.2%
49	Pet Waste	3.1%	7.4%	8.7%	0.0%
50	Diapers	1.4%	5.5%	2.4%	1.8%
51	Composite Materials	5.7%	3.2%	4.9%	4.5%
52	Liquids	1.8%	0.9%	0.0%	0.5%
53	Grit	2.2%	3.9%	1.9%	2.3%
	TOTALS	**100.0%**	**100.0%**	**100.0%**	**100.0%**
	Annual Tons	**978.51**		**821.25**	

Note: Columns may not appear to calculate correctly due to rounding

Appendix D:
Chatham County
2024 Waste Composition Study
Individual Visual Audit Results

Table D-1: Individual Visual Audit Results (% by volume)

	Location	Siler City	Goldston	Cole Park	Crutchfield Crossroads	Bonlee	Pittsboro
	Container Volume (cy)	30	30	30	30	30	40
	Approximate % full	90%	25%	100%	50%	100%	60%
	Net Load Weight	1.13	0.33	3.17	1.17	1.75	1.05
Paper	Corrugated Cardboard	8.8%	0.0%	4.2%	2.5%	5.0%	6.3%
	Other Paper	0.0%	0.0%	0.0%	1.3%	0.0%	0.0%
Plastic	Film	2.5%	0.0%	0.0%	2.5%	6.7%	0.0%
	Polystyrene Foam	0.0%	0.0%	1.7%	0.0%	0.0%	1.3%
	PVC Pipe	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	Other Rigid Plastics	0.0%	0.0%	5.0%	10.0%	24.2%	3.8%
Metal	Major Appliances	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	HVAC Ducting	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	Other Ferrous	0.0%	0.0%	1.7%	0.0%	2.5%	2.5%
	Other Non-Ferrous	0.0%	0.0%	0.0%	0.0%	0.0%	1.3%
Organics	Yard Waste	0.0%	0.0%	0.0%	0.0%	3.3%	0.0%
	Soil	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
C&D Debris	Untreated Wood	0.0%	0.0%	1.7%	0.0%	0.0%	0.0%
	Treated Wood	3.8%	0.0%	12.5%	2.5%	4.2%	1.3%
	Carpet & Padding	7.5%	0.0%	15.0%	0.0%	0.0%	2.5%
	Drywall	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	Roofing Shingles	0.0%	0.0%	0.0%	0.0%	0.8%	0.0%
	Concrete	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	Asphalt	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	Rock	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	Brick and Masonry	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	Fines and Grit	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	Fiberglass - insulation	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	Fiberglass - rigid	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	Tile/Porcelain	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	Linoleum/Vinyl	0.0%	0.0%	0.8%	0.0%	0.0%	0.0%
	Paned Glass	2.5%	0.0%	0.0%	0.0%	2.5%	1.3%
Furniture	Furniture	37.5%	70.0%	16.7%	16.3%	20.0%	5.0%
	Mattresses	16.3%	25.0%	8.3%	2.5%	5.8%	67.5%
Bagged	Household Garbage	18.8%	0.0%	24.2%	58.8%	10.8%	5.0%
	C&D Debris	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Other	E-Waste	0.0%	5.0%	0.0%	0.0%	0.0%	0.0%
	Other Appliances	2.5%	0.0%	0.8%	3.8%	1.7%	0.0%
	HHW	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	Tires	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	Textiles	0.0%	0.0%	2.5%	0.0%	8.3%	0.0%
	Mixed Residue/Loose MSW	0.0%	0.0%	5.0%	0.0%	4.2%	2.5%
	Total	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**
	Annual Tons	**449.85**	**119.94**	**364.17**	**160.72**	**285.7**	**166.06**

Note: Columns may not appear to calculate correctly due to rounding

Table D-1: Individual Visual Audit Results (% by volume) - continued

	Location	Martha's Chapel	Harper's Crossroads	Hadley	Moncure	Asbury	Bennet
	Container Volume (cy)	30	30	30	30	30	30
	Approximate % full	90%	50%	50%	70%	40%	50%
	Net Load Weight	1.77	0.69	0.72	0.24	0.57	0.84
Paper	Corrugated Cardboard	6.3%	5.0%	0.0%	7.5%	2.5%	3.3%
	Other Paper	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Plastic	Film	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	Polystyrene Foam	2.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	PVC Pipe	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	Other Rigid Plastics	8.3%	15.0%	1.5%	11.3%	7.5%	5.0%
Metal	Major Appliances	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	HVAC Ducting	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	Other Ferrous	0.0%	2.5%	1.0%	0.0%	0.0%	0.0%
	Other Non-Ferrous	0.0%	0.0%	0.0%	1.3%	0.0%	0.0%
Organics	Yard Waste	0.0%	2.5%	0.0%	0.0%	0.0%	0.0%
	Soil	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
C&D Debris	Untreated Wood	0.8%	0.0%	0.0%	0.0%	75.0%	0.0%
	Treated Wood	0.0%	2.5%	0.0%	13.8%	0.0%	0.0%
	Carpet & Padding	10.8%	25.0%	10.0%	0.0%	0.0%	0.0%
	Drywall	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	Roofing Shingles	0.0%	0.0%	0.0%	0.0%	0.0%	0.5%
	Concrete	0.0%	2.5%	0.0%	0.0%	0.0%	0.0%
	Asphalt	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	Rock	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	Brick and Masonry	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	Fines and Grit	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	Fiberglass - Insulation	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	Fiberglass - Rigid	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	Tile/Porcelain	0.0%	2.5%	0.0%	1.3%	0.0%	0.0%
	Linoleum/Vinyl	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	Paned Glass	0.0%	0.0%	0.0%	3.8%	0.0%	0.0%
Furniture	Furniture	33.3%	7.5%	33.5%	28.8%	10.0%	16.3%
	Mattresses	14.2%	25.0%	34.0%	10.0%	0.0%	23.8%
Bagged	Household Garbage	18.3%	0.0%	17.5%	11.3%	0.0%	46.3%
	C&D Debris	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Other	E-Waste	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	Small Appliances	1.7%	5.0%	2.5%	6.3%	0.0%	0.0%
	HHW	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	Tires	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	Textiles	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
	Mixed Residue/Loose MSW	4.2%	5.0%	0.0%	5.0%	5.0%	5.0%
	Total	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**
	Annual Tons	**177.68**	**48.48**	**54.01**	**72.18**	**65.98**	**26.2**

Note: Columns may not appear to calculate correctly due to rounding

Appendix E:
Chatham County
2024 Waste Composition Study
Visual Audit Photos

Siler City

Goldston

Cole Park

Crutchfield Crossroads

Bonlee

Pittsboro

Martha's Chapel

Harper's Crossroads

Hadley

Moncure

Asbury

Bennet