WAKE COUNTY
NORTH CAROLINA

FINAL REPORT

Wake County Public School System
2023 Waste Composition Study

June 1
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PREPARED FOR

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Section 1
Introduction

1.1 Study Objectives

Wake County (County) has contracted with Kessler Consulting, Inc. (KCI) to conduct a waste composition study (WCS) to estimate the composition of solid waste disposed by the Wake County Public School System (WCPSS). The primary objective of the study is to estimate the types and quantities of recyclable and compostable waste components in the Elementary, Middle, and High School waste streams. The basis for this waste characterization consists of a five-day sampling event which was conducted from January 30, 2023, through February 3, 2023, during which 40 waste samples were collected and sorted. The data will be used by the County to develop long-term waste management strategies and to evaluate the effectiveness of current recycling program called "Feed the Bin." This report presents the methodology and results of the WCS, as well as recommendations for future program improvements.

1.2 Background

WCPSS currently operates 198 public schools. To reduce the amount of waste being disposed within the school system, the County partnered with WCPSS to implement the "Feed the Bin" recycling program. Feed the Bin was implemented across the WCPSS system in a phased approach from 2004 through 2007. As additional schools were built, they were added to Feed the Bin. A visual audit was conducted on WCPSS waste in 2004 and previous WCSs on WCPSS waste were conducted in 2008 and 2014.

1.3 Acknowledgements

KCI would like to acknowledge and thank all County and WCPSS staff members who assisted with the planning and execution of the WCS, including the scalehouse and operations staff. KCI would also like to thank GFL Environmental for dedicating a route for collecting the school waste and for removing waste after it was sorted.

Section 2
Methodology

2.1 Location, Equipment, and Labor

The WCS was conducted over five consecutive days from January 30 – February 3, 2023. All sampling and sorting occurred at the South Wake Transfer Station (SWTS) located at 6130 Old Smithfield Road in Apex, NC. All sampling and sorting activities occurred within the west bay of the SWTS.

KCI provided all sorting equipment; safety gear; a primary and backup scale calibrated to 0.05 pounds; and a Field Manger to oversee all sampling, sorting, weighing, and data recording. The County coordinated with GFL to remove waste after sorting with roll-off containers. KCI contracted with a temporary labor company to provide a crew to assist with sorting.

KCI prepared and the County/WCPSS staff reviewed and approved a Site Safety Plan that was followed throughout the sorting event. KCI worked closely with County staff to coordinate and set up a sort location at the SWTS that would ensure worker safety. Each morning of the event, sorters were given thorough safety instructions by KCI's Field Manager to ensure worker safety and proper sorting. No injuries occurred during the sorting event.

2.2 Generator Sectors and Sorting Events

The WCS assessed waste generated from three primary generator sectors, as follows:

- Elementary Schools
- Middle Schools
- High Schools

2.3 Material Categories

Waste was sorted into the 41 material categories defined in Appendix A (Appendix B includes example stock photos of these materials). KCI reviewed the County's recycling program and discussed with the County and WCPSS staff to develop and define these material categories and ensure they met the objectives of the WCS. As much as possible, KCI ensured these categories aligned with the material categories used in previous WCSs conducted for WCPSS.

2.4 Sampling and Sorting Procedures

Throughout the WCS, KCI followed the Sampling and Sorting Protocol that was reviewed and approved prior to the event. The sorting event occurred over a one-week period,

during which KCI pulled 40 samples of waste from seven groups of schools, grouped by school type and geographic region. Each group was collected on a dedicated route run by one of GFL's front load collection vehicles to collect waste from pre-selected schools: three groups of elementary schools, two groups of middle schools, and two groups of high schools. Table 2-1 lists the schools included in each group. For consistency, these were the same schools as were sampled in the 2008 and 2014 WCSs. Five samples were pulled from each high school and middle school group and six to seven samples were pulled from each elementary school group.

Table 2-1: Sample Schedule

School Classification	Group	Schools		Number of Samples
High School	North	Knightdale High Enloe High Millbrook High	Wake Forest High Wakefield High Sanderson High Leesville High	5
	South	Southeast Raleigh High Athens Drive High	Apex High Fuquay-Varina High Middle Creek High	5
Middle School	North	Moore Square Museum Ligon Middle Carnage Middle East Garner Middle North Garner Middle	Neuse River Middle (formerly East Wake Middle) East Millbrook Middle Durant Road Middle Carroll Middle	5
	South	Lufkin Road Middle Apex Middle Salem Middle East Cary Middle	Oberlin Magnet Middle (formerly Daniels Middle) Martin Middle Centennial Middle Dillard Drive Middle	5
Elementary	North	Fox Road Elementary Wildwood Forest Elementary Durant Road Elementary Millbrook Elementary North Ridge Elementary Baileywick Elementary	Lead Mine Elementary Green Elementary Jeffreys Grove Elementary York Elementary Hilburn Academy (formerly Hilburn Elementary) Stough Elementary	7
	South	Dillard Drive Elementary Yates Mill Elementary Swift Creek Elementary Farmington Woods Elementary Briarcliff Elementary	Baucom Elementary Salem Elementary Olive Chapel Elementary Apex Elementary Oak Grove Elementary Penny Road Elementary	7
	Central	Bugg Elementary Poe Elementary Fuller Elementary Hunter Elementary Conn Elementary Powell Elementary	Wiley Elementary Underwood Elementary Partnership Elementary (formerly Partnership Primary) Olds Elementary Combs Elementary Joyner Elementary	6

To obtain a representative sample from a selected load of waste, the vehicle driver was directed to tip on the floor of the transfer station. The load was visually divided into six sections and a representative sample of at least 200 pounds was pulled from each section. When five samples were needed, one section was randomly selected to not be sampled, and when seven samples were needed, the seventh sample was pulled from the middle of the pile. Samples were placed on a tarp at the sorting area, labeled, and stored until sorted. All samples were hand-sorted into the previously defined material categories. After the entire sample was sorted, KCI staff weighed and recorded the net weights of each material category in a tablet-based data log.

2.5 Analytic Procedures

Following the field work, KCI compiled all individual sample data and ensured there were no errors in the data or calculations. KCI calculated the average generation rate per student based on current enrollment at each generator sector (school type). This was calculated by the number of student days each load represented. Student days are the number of days worth of waste generation from each school in each container when collected for the WCS (assuming the container was previously serviced per the schools normal schedule) times the number of student enrollment at the school. For example, a school with an enrollment of 200 students has a Monday and Thursday collection schedule and was collected on Monday for the WCS; that would represent two days of generation or 400 student days. This was calculated for all schools in each group and summed. The net load weight was then divided by the students to calculate the generation rate as pounds per student per day. The groups in each school type were averaged to calculate the average generation rate by type.

KCI calculated the average composition for each school type weighted by the calculated total daily generation for each group of schools (that group's generation rate times total enrollment of the group). An overall aggregate WCPSS waste composition was calculated by averaging the results of all samples doubly weighted by calculating total daily generation for each group of schools and the total daily generation of all schools of that school type (the average generation rate of the school type times the total enrollment of all schools of the type). Additionally, a 90 percent confidence interval was calculated for each material category in the waste stream using a standard statistical t-test for each school type and the aggregate composition. The confidence interval indicates that with a 90 percent level of confidence the actual arithmetic mean is within the upper and lower limits of the interval. Results were also compared to the 2008 and 2014 school WCS.

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Section 3
Results

3.1 Introduction to Results

Results are organized by generator sector (school type), followed by the countywide aggregate results. Unless otherwise stated, all results presented in this section are expressed in percentage by weight. The percentages included in the tables and figures are the weighted mean values for each material category. Where appropriate, the tables also provide the 90 percent confidence intervals for each material category. For the purposes of discussion and analysis, materials were organized into six broad material groups based on diversion potential:

- Accepted Recyclable Paper: Paper materials currently accepted in the "Feed the Bin" program or otherwise accepted at the school for recycling (i.e., corrugated cardboard).
    - Newspaper
    - Corrugated Cardboard
    - Office Paper
    - Softcover Textbooks
    - Mixed Recyclable Paper
- Accepted Recyclable Containers: Containers currently accepted in the "Feed the Bin" program.
    - PET Bottles (#1)
    - HDPE Bottles (#2)
    - Non-Bottle HDPE Containers (#2)
    - Other Bottles, Tubs, Jugs, and Jars
    - Tin/Steel Cans
    - Aluminum Cans
    - Glass Containers
- Potentially Compostable Materials: Materials that potentially could be composted in a commercial composting facility. This may require proper source-separation or preprocessing to remove inorganic material.
    - Compostable Paper
    - Yard Waste
    - Vegetative Food Waste
    - Non-Vegetative Food Waste
    - Other Organics
- Other Potentially Recoverable Materials: Materials that have the potential to be recovered or recycled, including materials accepted at the County's convenience centers, but are not currently accepted in the "Feed the Bin" program. Some of these materials would require source-separation and/or additional processing to recover.
    - Aseptic/Polycoated Containers
    - Hardcover Textbooks
    - Non-Bottle PET Containers (#1)
    - Unaccepted Plastic Containers
    - Bulky Rigid Plastics
    - Ferrous Scrap Metals
    - Aluminum Foil and Trays
    - Non-Ferrous Scrap Metals
    - Textiles/Leather
    - Hazardous/Special Waste
    - Small Appliances
    - Electronics
    - C&D Debris
    - Furniture

- All Other Materials: Materials not classified above and not feasible to recover with traditional programs or technology.
    - Non-Compostable, Non-Recyclable Paper
    - Expanded Polystyrene Foam
    - Non-Rigid Plastic Film
    - All Other Plastics
    - Other Glass
    - Household Batteries
    - Tires and Rubber
    - Composite Materials
    - Grit
    - Liquids

When feasible, the results of the present study were compared to the WCSs completed in 2008 and 2014. Due to the evolution of material streams and processing technologies, the categories in the two studies were not exactly the same. KCI has aligned the categories as best as possible to allow comparison between the three studies.

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3.2 Waste Generation Rates

Table 3-1 shows the daily waste generation rates for each group of schools, as well as the related data used to calculate the generation rates.

Key findings from the generation rate results include:

- On average, elementary schools had a higher generation rate of the three school types, and high schools had the lowest.
- The High Schools – North load included a large number of bags of yard waste, these were mostly leaves presumably from grounds keeping. This likely increased the total generation calculated from this group of schools.
- The generation rates ranged greatly both within and between school types. Additional measurements across a wider range of time would provide more accurate generation rate estimates.

Table 3-1: Generation Rates

Group	Load Weight (tons)	Student Days per Group*	Generation Rate (pounds/student/day)	Total Enrollment per Group	Daily Generation per Group (tons/day)
Elementary Schools - Central	1.63	4,900	0.67	4,631	1.54
Elementary Schools - North	2.93	6,055	0.97	6,055	2.93
Elementary Schools - South	3.34	9,104	0.73	6,508	2.39
Middle Schools - North	3.40	7,820	0.87	7,820	3.40
Middle Schools - South	2.36	9,158	0.52	7,125	1.84
High Schools - North	3.94	14,940	0.53	14,940	3.94
High Schools - South	1.45	9,537	0.30	9,537	1.45

*Sum product of the enrollment at each school and the number of days of waste collected at each school.

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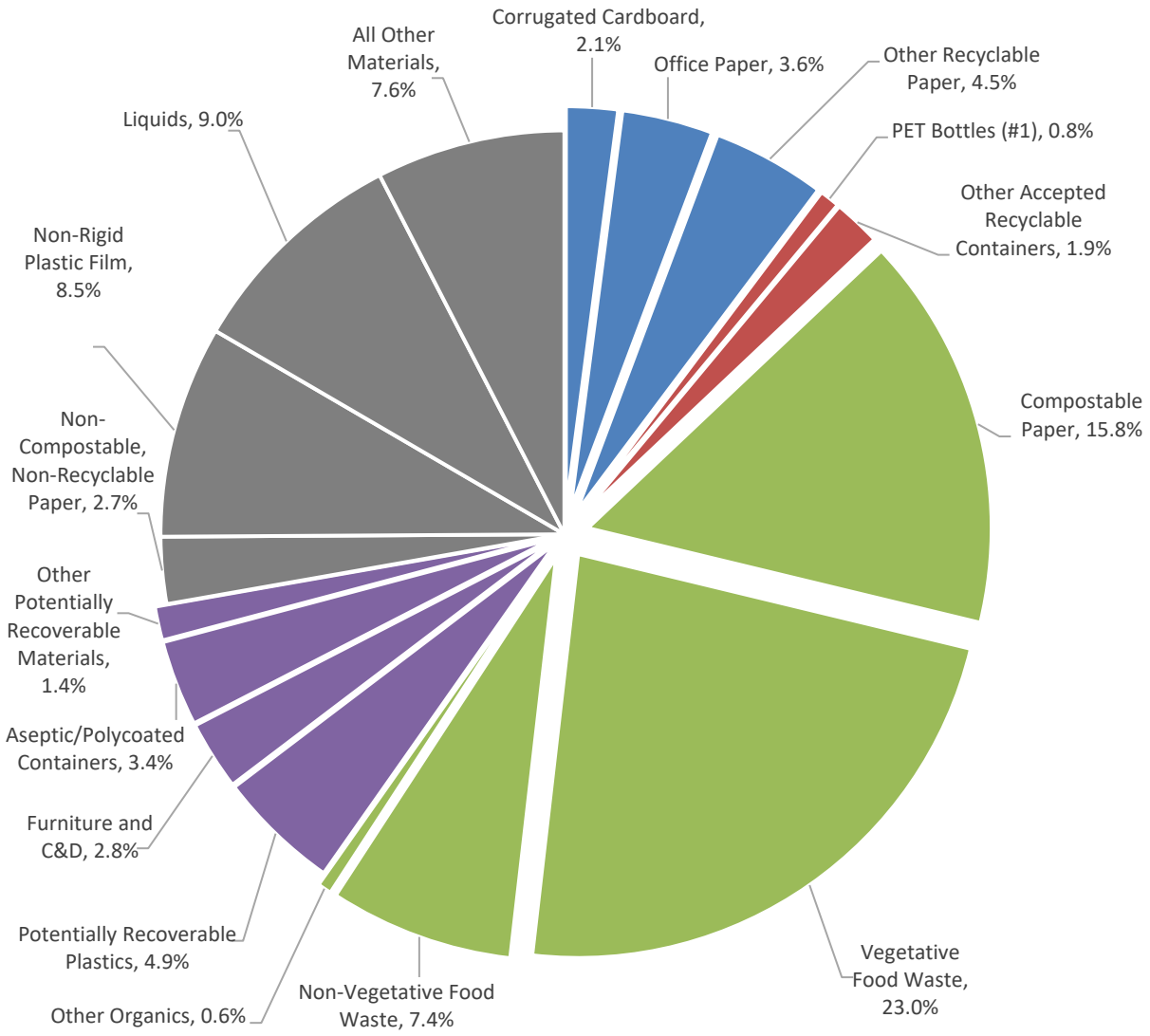
3.3 Elementary School Waste

Figure 3-1 depicts the weighted average composition of elementary school waste. Table 3-2 provides the weighted average with a 90 percent confidence interval for each material category measured in the elementary school waste. Table 3-3 compares the composition of elementary school waste from the current WCS to the 2014 and 2008 WCS. Individual sample results are included in Appendix C.

Key findings from the elementary school results include:

- Nearly half of the elementary school waste stream consisted of potentially compostable material. This included:
    - Over 30 percent of the waste stream was food waste. Most of the food waste was vegetative, at 23 percent, and non-vegetative waste (i.e., meat and dairy) consisted of about 7 percent.
    - Compostable paper comprised almost 16 percent of the waste.
- Other potentially recoverable materials comprised over 12 percent of the waste stream. Over half of this is unaccepted plastic containers and aseptic/polycoated containers, each over 3 percent. The percentage of aseptic/polycoated containers was much higher than typical waste streams, and mostly included milk cartons and juice boxes. The samples also included school furniture that was discarded.
- Accepted recyclable paper made up over 10 percent of the waste stream. The category comprised of a split of office paper and other recyclable paper (includes the categories of newspaper, softcover textbooks, and mixed recyclable paper). Several samples contained large stacks of office paper and construction/art paper.
- Less than 3 percent of the waste stream consisted of PET bottles and other accepted recyclable containers. This included large tin/steel cans from cafeteria food preparation that were found in multiple samples.
- All other materials made up almost 28 percent of the waste stream. Liquids was the largest category in this group, at 9 percent; non-rigid plastic film was next largest category, at 8 percent. The high volume of liquids was mostly from full or partially full milk cartons and juice boxes.
- Compared to the previous WCSs:
    - The average percentage of food waste has increased since the previous WCSs.
    - The percentage of aseptic/polycoated containers was much lower than in previous WCSs. This may be due to students taking fewer milk or juice boxes.

Figure 3-1: Composition of Elementary School Waste



Notes: For this figure, the following categories have been combined:

- Other Recyclable Paper includes the categories of Newspaper, Softcover Textbooks, and Mixed Recyclable Paper
- Other Accepted Recyclable Containers includes HDPE Bottles (#2), Non-Bottle HDPE Containers (#2), Other Bottles, Tubs, Jugs, and Jars, Tin/Steel Cans, Aluminum Cans, and Glass Containers
- Potentially Recoverable Plastics includes Non-Bottle PET Containers (#1), Unaccepted Plastic Containers, and Bulky Rigid Plastics
- Other Potentially Recoverable Materials includes Ferrous Scrap Metals, Aluminum Foil and Trays, Non-Ferrous Scrap Metals, Textiles/Leather, Hazardous/Special Waste, Small Appliances, and Electronics
- All Other Materials includes Expanded Polystyrene Foam, All Other Plastics, Other Glass, Household Batteries, Tires and Rubber, Composite Materials, Grit

Table 3-2: Composition of Elementary School Waste

Material Category	Weighted Average	90% Confidence Interval	
		Lower Bounds	Upper Bounds
Newspaper	**0.0%**	0.0%	0.1%
Corrugated Cardboard	**2.1%**	1.2%	2.9%
Office Paper	**3.6%**	2.6%	4.7%
Softcover Textbooks	**0.4%**	-0.1%	0.8%
Mixed Recyclable Paper	**4.1%**	3.1%	5.2%
Accepted Recyclable Paper	**10.2%**	**8.7%**	**11.8%**
PET Bottles (#1)	**0.8%**	0.6%	1.0%
HDPE Bottles (#2)	**0.3%**	0.2%	0.3%
Non-Bottle HDPE Containers (#2)	**0.2%**	0.1%	0.3%
Other Bottles, Tubs, Jugs, and Jars	**0.1%**	0.1%	0.2%
Tin/Steel Cans	**0.8%**	0.3%	1.2%
Aluminum Cans	**0.3%**	0.2%	0.4%
Glass Containers	**0.3%**	0.1%	0.5%
Accepted Recyclable Containers	**2.7%**	**2.0%**	**3.4%**
Compostable Paper	**15.8%**	14.9%	16.7%
Yard Waste	**0.0%**	0.0%	0.0%
Vegetative Food Waste	**23.0%**	21.2%	24.9%
Non-Vegetative Food Waste	**7.4%**	5.9%	8.9%
Other Organics	**0.6%**	0.0%	1.1%
Potentially Compostable Materials	**46.8%**	**44.0%**	**49.6%**
Aseptic/Polycoated Containers	**3.4%**	3.2%	3.7%
Hardcover Textbooks	**0.2%**	-0.1%	0.5%
Non-Bottle PET Containers (#1)	**0.7%**	0.5%	0.9%
Unaccepted Plastic Containers	**3.5%**	2.9%	4.1%
Bulky Rigid Plastics	**0.7%**	0.4%	1.1%
Ferrous Scrap Metals	**0.1%**	0.0%	0.1%
Aluminum Foil and Trays	**0.2%**	0.1%	0.2%
Non-Ferrous Scrap Metals	**0.1%**	-0.1%	0.3%
Textiles/Leather	**0.4%**	0.1%	0.7%
Hazardous/Special Waste	**0.1%**	0.0%	0.1%
Small Appliances	**0.0%**	0.0%	0.1%
Electronics	**0.4%**	-0.1%	0.8%
C&D Debris	**0.9%**	0.1%	1.8%
Furniture	**1.9%**	-0.1%	3.8%
Other Potentially Recoverable Materials	**12.5%**	**10.4%**	**14.6%**
Non-Compostable, Non-Recyclable Paper	**2.7%**	2.2%	3.2%
Expanded Polystyrene Foam	**0.1%**	0.1%	0.2%
Non-Rigid Plastic Film	**8.5%**	8.0%	9.0%
All Other Plastics	**1.6%**	1.0%	2.2%
Other Glass	**0.1%**	-0.1%	0.3%
Household Batteries	**0.0%**	0.0%	0.0%
Tires and Rubber	**0.0%**	0.0%	0.0%
Composite Materials	**5.7%**	4.7%	6.8%
Grit	**0.0%**	0.0%	0.0%
Liquids	**9.0%**	7.6%	10.5%
All Other Materials	**27.8%**	**25.8%**	**29.8%**
Total	**100.0%**		

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

Table 3-3: Comparison of Elementary School Waste to 2014 & 2008 WCS

Material Category	2023 Weighted Average	2014 Weighted Average	2008 Weighted Average
Corrugated Cardboard	2.1%	1.8%	1.4%
Other Recyclable Paper[1]	8.2%	8.8%	6.1%
Textbooks[2]	0.2%	0.7%	0.1%
Aseptic/Polycoated Containers	3.4%	8.8%	10.1%
PET #1 Containers[3]	1.5%	1.3%	1.9%
HDPE #2 Containers[4]	0.4%	0.1%	0.4%
Expanded Polystyrene Foam	0.1%	1.0%	0.9%
Non-Rigid Plastic Film	8.5%	13.4%	6.7%
Aluminum Cans	0.3%	0.2%	0.3%
Tin/Steel Cans	0.8%	0.2%	0.3%
Other Metals[5]	0.2%	1.1%	0.0%
Glass Containers	0.3%	0.1%	0.4%
Textiles/Leather	0.4%	0.6%	N/A
Vegetative Food Waste	23.0%	20.1%	20.1%
Non-Vegetative Food Waste	7.4%	3.4%	
Compostable Paper	15.8%	13.1%	N/A
Yard Waste	0.0%	1.0%	0.5%
Electronics	0.4%	0.1%	0.3%
C&D Debris	0.9%	0.7%	0.8%
Non-Recyclable Waste[6]	26.2%	23.8%	49.7%
Totals[7]	**100.0%**	**100.0%**	**100.0%**

[1]Contains Mixed Paper, Office Paper, Newspaper, Magazines and Catalogs, Telephone Directories, and Other Recyclable Paper (previous WCSs categories)
[2]Assume Hardcover Textbooks
[3]Contains both PET Bottles and PET Non-Bottles
[4]Contains both HDPE Bottles and HDPE Non-Bottles
[5]Contains Ferrous and Non-Ferrous Scrap Metals
[6]Non Recyclable Waste Contains: Non-Compostable, Non-Recyclable Paper, Other Bottles, Tubs, Jugs, and Jars, Unaccepted Plastic Containers, Bulky Rigid Plastics, All Other Plastics, Aluminum Foil and Trays, Other Glass, Hazardous/Special Waste, Small Appliances, Household Batteries, Furniture, Tires and Rubber, Other Organics, Composite Materials, Grit, and Liquids
[7]Columns may not appear to sum correctly due to rounding

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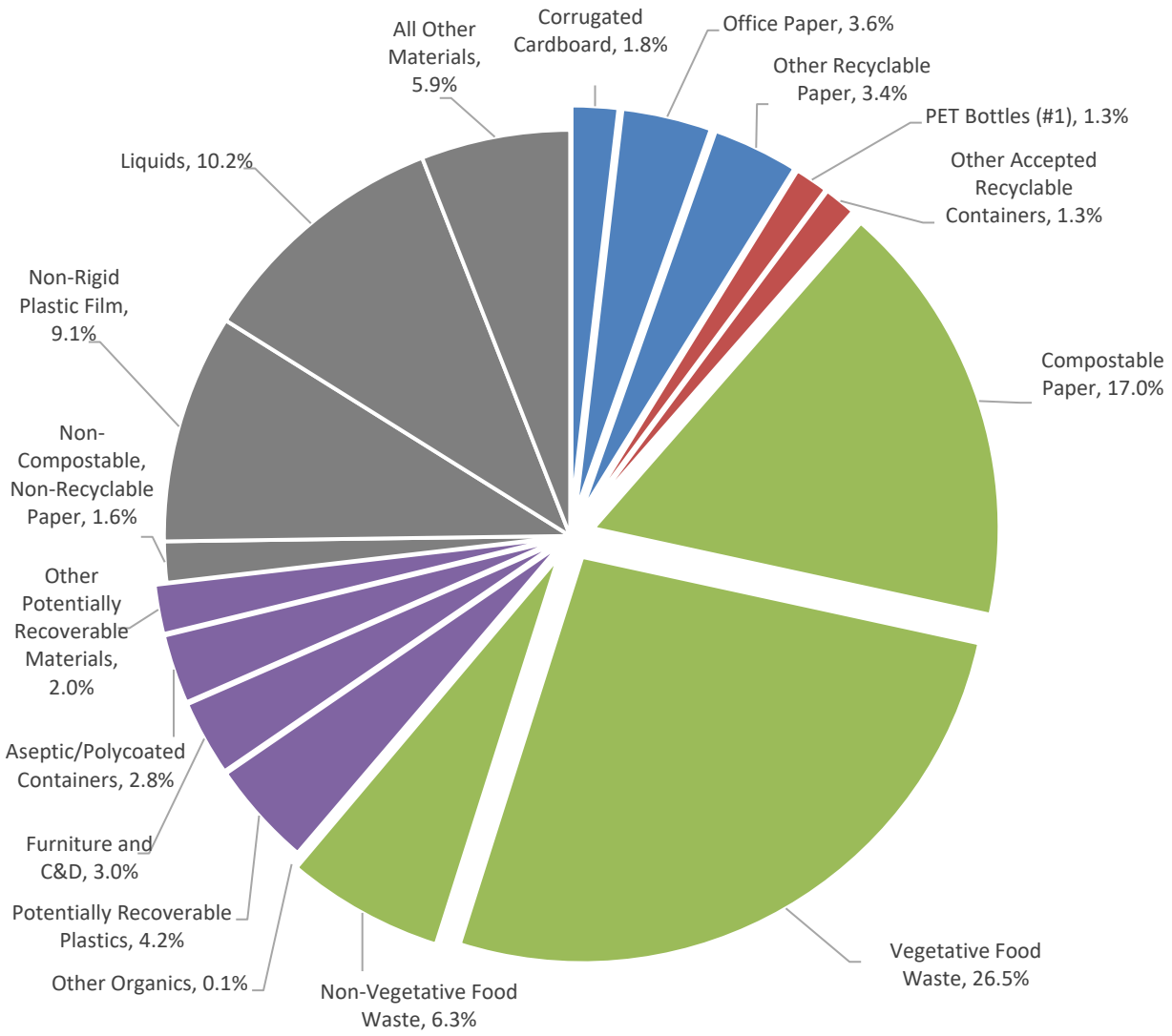
3.4 Middle School Waste

Figure 3-2 depicts the weighted average composition of middle school waste. Table 3-4 provides the weighted average with a 90 percent confidence interval for each material category measured in the middle school waste. Table 3-5 compares the composition of middle school waste from the current WCS to the 2014 and 2008 WCS. Individual sample results are included in Appendix C.

Key findings from the middle school results included:

- Similar to the elementary school waste stream, approximately half of the middle school waste stream consisted of potentially compostable material.
    - Food waste was again the main component to the compostable material. Most of the food waste was vegetative at over 26 percent and non-vegetative waste consisted of about 6 percent.
    - Compostable paper made up nearly all of the remaining compostable material.
- Other potentially recoverable materials comprised about 12 percent of the waste stream. As with elementary schools, about half of this was aseptic/polycoated containers and unaccepted plastic containers. Furniture and other construction and demolition debris were found in the waste stream as well, a combined 3 percent.
- Accepted recyclable paper made up almost 9 percent of the waste stream, a lower average than elementary schools but with overlapping confidence intervals. The category comprised of a split of office paper and other recyclable paper. Again, office paper was found in large stacks in some samples.
- Less than 3 percent of the waste stream consisted of accepted recyclable containers. PET bottles had a higher percentage in the middle school waste than elementary school waste.
- All other materials made up nearly 27 percent of the middle school waste stream. Liquids, mostly from full or partially full milk containers and juice boxes, was again the largest category in this group, at about 10 percent; non-rigid plastic film was the next largest category, at 9 percent.
- Compared to previous WCSs:
    - The percentage of food waste had a greater increase from previous WCSs than the elementary school waste.
    - Again, the percentage of aseptic/polycoated containers was much lower.
    - The other recyclable paper had a marked decrease from previous WCSs.
    - Expanded polystyrene foam shows a decrease from the 2008 WCS.

Figure 3-2: Composition of Middle School Waste



Notes: For this figure, the following categories have been combined:

- Other Recyclable Paper includes the categories of Newspaper, Softcover Textbooks, and Mixed Recyclable Paper
- Other Accepted Recyclable Containers includes HDPE Bottles (#2), Non-Bottle HDPE Containers (#2), Other Bottles, Tubs, Jugs, and Jars, Tin/Steel Cans, Aluminum Cans, and Glass Containers
- Potentially Recoverable Plastics includes Non-Bottle PET Containers (#1), Unaccepted Plastic Containers, and Bulky Rigid Plastics
- Other Potentially Recoverable Materials includes Ferrous Scrap Metals, Aluminum Foil and Trays, Non-Ferrous Scrap Metals, Textiles/Leather, Hazardous/Special Waste, Small Appliances, and Electronics
- All Other Materials includes Expanded Polystyrene Foam, All Other Plastics, Other Glass, Household Batteries, Tires and Rubber, Composite Materials, Grit

Table 3-4: Composition of Middle School Waste

Material Category	Weighted Average	90% Confidence Interval	
		Lower Bounds	Upper Bounds
Newspaper	0.0%	0.0%	0.0%
Corrugated Cardboard	1.8%	0.5%	3.2%
Office Paper	3.6%	0.4%	6.7%
Softcover Textbooks	0.1%	0.0%	0.2%
Mixed Recyclable Paper	3.3%	1.0%	5.7%
Accepted Recyclable Paper	**8.8%**	**3.7%**	**13.9%**
PET Bottles (#1)	1.3%	1.1%	1.6%
HDPE Bottles (#2)	0.1%	0.0%	0.2%
Non-Bottle HDPE Containers (#2)	0.0%	0.0%	0.1%
Other Bottles, Tubs, Jugs, and Jars	0.0%	0.0%	0.1%
Tin/Steel Cans	0.5%	0.0%	0.9%
Aluminum Cans	0.4%	0.3%	0.5%
Glass Containers	0.2%	0.0%	0.4%
Accepted Recyclable Containers	**2.6%**	**2.1%**	**3.1%**
Compostable Paper	17.0%	14.8%	19.2%
Yard Waste	0.0%	0.0%	0.0%
Vegetative Food Waste	26.5%	22.7%	30.2%
Non-Vegetative Food Waste	6.3%	5.5%	7.0%
Other Organics	0.1%	0.0%	0.2%
Potentially Compostable Materials	**49.8%**	**44.4%**	**55.2%**
Aseptic/Polycoated Containers	2.8%	2.6%	2.9%
Hardcover Textbooks	0.8%	-0.3%	1.9%
Non-Bottle PET Containers (#1)	0.7%	0.4%	1.0%
Unaccepted Plastic Containers	3.2%	2.6%	3.9%
Bulky Rigid Plastics	0.3%	0.1%	0.5%
Ferrous Scrap Metals	0.4%	-0.1%	1.0%
Aluminum Foil and Trays	0.2%	0.2%	0.3%
Non-Ferrous Scrap Metals	0.0%	0.0%	0.0%
Textiles/Leather	0.3%	0.0%	0.7%
Hazardous/Special Waste	0.0%	0.0%	0.1%
Small Appliances	0.0%	0.0%	0.0%
Electronics	0.1%	-0.1%	0.3%
C&D Debris	1.5%	-0.5%	3.5%
Furniture	1.5%	-1.8%	4.8%
Other Potentially Recoverable Materials	**11.9%**	**8.0%**	**15.9%**
Non-Compostable, Non-Recyclable Paper	1.6%	1.1%	2.1%
Expanded Polystyrene Foam	0.5%	-0.2%	1.2%
Non-Rigid Plastic Film	9.1%	8.1%	10.1%
All Other Plastics	1.2%	0.8%	1.6%
Other Glass	0.0%	0.0%	0.0%
Household Batteries	0.0%	0.0%	0.0%
Tires and Rubber	0.0%	0.0%	0.0%
Composite Materials	4.2%	2.6%	5.7%
Grit	0.0%	0.0%	0.0%
Liquids	10.2%	8.6%	11.7%
All Other Materials	**26.8%**	**24.6%**	**29.1%**
Total	**100.0%**		

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

Table 3-5: Comparison of Middle School Waste to 2014 & 2008 WCS

Material Category	2023 Weighted Average	2014 Weighted Average	2008 Weighted Average
Corrugated Cardboard	1.8%	1.6%	0.9%
Other Recyclable Paper[1]	7.0%	11.3%	15.1%
Textbooks[2]	0.8%	1.4%	0.0%
Aseptic/Polycoated Containers	2.8%	6.9%	7.1%
PET #1 Containers[3]	2.0%	2.6%	3.0%
HDPE #2 Containers[4]	0.1%	0.2%	0.3%
Expanded Polystyrene Foam	0.5%	0.8%	3.3%
Non-Rigid Plastic Film	9.1%	11.6%	6.6%
Aluminum Cans	0.4%	0.3%	0.5%
Tin/Steel Cans	0.5%	0.1%	0.3%
Other Metals[5]	0.4%	0.5%	0.6%
Glass Containers	0.2%	0.3%	0.3%
Textiles/Leather	0.3%	2.1%	N/A
Vegetative Food Waste	26.5%	17.1%	12.4%
Non-Vegetative Food Waste	6.3%	4.8%	
Compostable Paper	17.0%	12.9%	N/A
Yard Waste	0.0%	0.1%	0.0%
Electronics	0.1%	0.1%	0.1%
C&D Debris	1.5%	1.6%	2.0%
Non-Recyclable Waste[6]	22.6%	23.7%	47.3%
Totals[7]	**100.0%**	**100.0%**	**100.0%**

[1]Contains Mixed Paper, Office Paper, Newspaper, Magazines and Catalogs, Telephone Directories, and Other Recyclable Paper (previous WCSs categories)
[2]Assume Hardcover Textbooks
[3]Contains both PET Bottles and PET Non-Bottles
[4]Contains both HDPE Bottles and HDPE Non-Bottles
[5]Contains Ferrous and Non-Ferrous Scrap Metals
[6]Non Recyclable Waste Contains: Non-Compostable, Non-Recyclable Paper, Other Bottles, Tubs, Jugs, and Jars, Unaccepted Plastic Containers, Bulky Rigid Plastics, All Other Plastics, Aluminum Foil and Trays, Other Glass, Hazardous/Special Waste, Small Appliances, Household Batteries, Furniture, Tires and Rubber, Other Organics, Composite Materials, Grit, and Liquids
[7]Columns may not appear to sum correctly due to rounding

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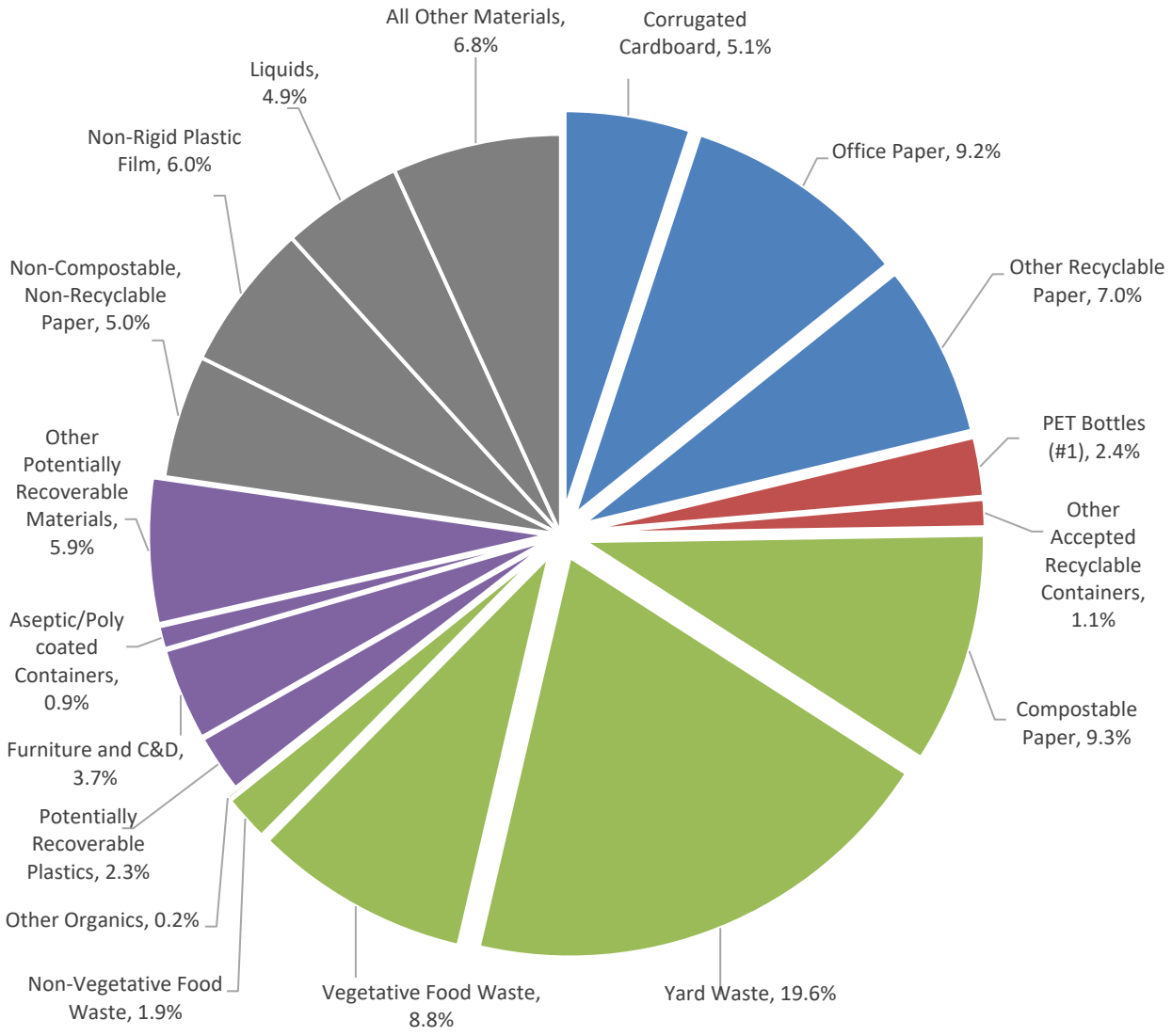
3.5 High School Waste

Figure 3-3 depicts the weighted average composition of high school waste. Table 3-6 provides the weighted average with a 90 percent confidence interval for each material category measured in the high school waste. Table 3-7 compares the composition of high school waste from the current WCS to the 2014 and 2008 WCS. Individual sample results are included in Appendix C.

Key findings from the high school results include:

- The high school waste stream was about 40 percent potentially compostable materials. This was a lower average than the other school types, although all have overlapping confidence intervals.
    - Yard waste had the highest percentage of the waste stream at almost 20 percent (almost twice the percentage of food waste). As discussed above, the High Schools – North load had a large quantity of bagged leaves and several samples from this load had a very high percentage of yard waste.
    - Food waste had a significantly lower percentage compared to the other school types; it was about a third of the percentage compared to the other types. Similarly, most of the food waste was vegetative at about 9 percent and non-vegetative waste at about 2 percent.
    - Compostable paper also had a significantly lower percentage than other school types, making up approximately 9 percent of compostable material.
- Other potentially recoverable materials comprised about 13 percent of the waste stream; this was primarily furniture, electronics, and textiles/leather. One sample had a large flat screen TV in it. Aseptic/polycoated containers comprised a smaller amount of the waste stream compared to the other school types.
- Accepted recyclable paper made up over 21 percent of the waste stream. This category was much higher compared to the other school types. Office paper alone was about 10 percent of the stream. The waste stream also had the highest average percentage of corrugated cardboard, at 5 percent.
- Similar to the other school types, approximately 3 percent of the high school waste stream was accepted recyclable containers; however, these were nearly all PET bottles.
- All other materials made up almost 23 percent of the waste stream. Liquids, non-rigid plastic film, composite materials, and non-compostable/non-recyclable paper each made up approximately 5 percent of the waste steam. Full milk cartons were much less prevalent in the high school waste.
- Compared to previous WCSs:
    - The percentage of other recyclable paper was lower than the 2008 WCS.
    - Expanded polystyrene foam had a lower percentage than previous WCSs.
    - Yard waste, expectedly, is much higher than previous WCSs.

Figure 3-3: Composition of High School Waste



Notes: For this figure, the following categories have been combined:

- Other Recyclable Paper includes the categories of Newspaper, Softcover Textbooks, and Mixed Recyclable Paper
- Other Accepted Recyclable Containers includes HDPE Bottles (#2), Non-Bottle HDPE Containers (#2), Other Bottles, Tubs, Jugs, and Jars, Tin/Steel Cans, Aluminum Cans, and Glass Containers
- Potentially Recoverable Plastics includes Non-Bottle PET Containers (#1), Unaccepted Plastic Containers, and Bulky Rigid Plastics
- Other Potentially Recoverable Materials includes Ferrous Scrap Metals, Aluminum Foil and Trays, Non-Ferrous Scrap Metals, Textiles/Leather, Hazardous/Special Waste, Small Appliances, and Electronics
- All Other Materials includes Expanded Polystyrene Foam, All Other Plastics, Other Glass, Household Batteries, Tires and Rubber, Composite Materials, Grit

Table 3-6: Composition of High School Waste

Material Category	Weighted Average	90% Confidence Interval	
		Lower Bounds	Upper Bounds
Newspaper	0.0%	0.0%	0.1%
Corrugated Cardboard	5.1%	2.4%	7.8%
Office Paper	9.2%	4.2%	14.1%
Softcover Textbooks	0.1%	-0.3%	0.6%
Mixed Recyclable Paper	6.8%	4.2%	9.5%
Accepted Recyclable Paper	**21.2%**	**15.6%**	**26.9%**
PET Bottles (#1)	2.4%	1.3%	3.5%
HDPE Bottles (#2)	0.2%	0.1%	0.3%
Non-Bottle HDPE Containers (#2)	0.1%	0.0%	0.1%
Other Bottles, Tubs, Jugs, and Jars	0.2%	0.0%	0.3%
Tin/Steel Cans	0.1%	0.1%	0.2%
Aluminum Cans	0.4%	0.2%	0.5%
Glass Containers	0.2%	-0.1%	0.5%
Accepted Recyclable Containers	**3.5%**	**2.2%**	**4.8%**
Compostable Paper	9.3%	6.3%	12.3%
Yard Waste	19.6%	7.0%	32.1%
Vegetative Food Waste	8.8%	5.7%	11.8%
Non-Vegetative Food Waste	1.9%	0.7%	3.1%
Other Organics	0.2%	0.0%	0.3%
Potentially Compostable Materials	**39.7%**	**29.3%**	**50.0%**
Aseptic/Polycoated Containers	0.9%	0.6%	1.2%
Hardcover Textbooks	0.2%	-0.4%	0.8%
Non-Bottle PET Containers (#1)	0.3%	0.2%	0.5%
Unaccepted Plastic Containers	1.0%	0.5%	1.4%
Bulky Rigid Plastics	1.0%	0.0%	2.0%
Ferrous Scrap Metals	0.3%	0.0%	0.6%
Aluminum Foil and Trays	0.1%	0.1%	0.2%
Non-Ferrous Scrap Metals	0.1%	0.0%	0.2%
Textiles/Leather	2.6%	1.5%	3.7%
Hazardous/Special Waste	0.2%	0.0%	0.3%
Small Appliances	0.2%	-0.4%	0.8%
Electronics	2.1%	-2.9%	7.2%
C&D Debris	0.7%	0.2%	1.2%
Furniture	3.0%	-2.6%	8.6%
Other Potentially Recoverable Materials	**12.9%**	**5.2%**	**20.6%**
Non-Compostable, Non-Recyclable Paper	5.0%	2.9%	7.1%
Expanded Polystyrene Foam	0.3%	0.1%	0.4%
Non-Rigid Plastic Film	6.0%	4.3%	7.6%
All Other Plastics	1.2%	0.7%	1.8%
Other Glass	0.0%	0.0%	0.1%
Household Batteries	0.0%	0.0%	0.1%
Tires and Rubber	0.0%	0.0%	0.0%
Composite Materials	5.3%	2.5%	8.0%
Grit	0.0%	0.0%	0.0%
Liquids	4.9%	2.0%	7.8%
All Other Materials	**22.7%**	**15.8%**	**29.6%**
Total	**100.0%**		

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

Table 3-7: Comparison of High School Waste to 2014 & 2008 WCS

Material Category	2023 Weighted Average	2014 Weighted Average	2008 Weighted Average
Corrugated Cardboard	5.1%	3.2%	4.7%
Other Recyclable Paper[1]	16.2%	18.0%	24.7%
Textbooks[2]	0.2%	0.1%	0.0%
Aseptic/Polycoated Containers	0.9%	2.8%	0.8%
PET #1 Containers[3]	2.7%	4.1%	3.1%
HDPE #2 Containers[4]	0.2%	0.1%	1.3%
Expanded Polystyrene Foam	0.3%	2.5%	1.3%
Non-Rigid Plastic Film	6.0%	9.6%	4.7%
Aluminum Cans	0.4%	0.3%	0.5%
Tin/Steel Cans	0.1%	0.1%	0.5%
Other Metals[5]	0.5%	3.8%	1.5%
Glass Containers	0.2%	0.6%	0.8%
Textiles/Leather	2.6%	1.5%	N/A
Vegetative Food Waste	8.8%	10.1%	4.4%
Non-Vegetative Food Waste	1.9%	3.6%	
Compostable Paper	9.3%	16.7%	N/A
Yard Waste	19.6%	0.5%	0.3%
Electronics	2.1%	0.9%	0.5%
C&D Debris	0.7%	2.3%	1.3%
Non-Recyclable Waste[6]	22.3%	19.4%	49.5%
Totals[7]	**100.0%**	**100.0%**	**100.0%**

[1]Contains Mixed Paper, Office Paper, Newspaper, Magazines and Catalogs, Telephone Directories, and Other Recyclable Paper (previous WCSs categories)
[2]Assume Hardcover Textbooks
[3]Contains both PET Bottles and PET Non-Bottles
[4]Contains both HDPE Bottles and HDPE Non-Bottles
[5]Contains Ferrous and Non-Ferrous Scrap Metals
[6]Non Recyclable Waste Contains: Non-Compostable, Non-Recyclable Paper, Other Bottles, Tubs, Jugs, and Jars, Unaccepted Plastic Containers, Bulky Rigid Plastics, All Other Plastics, Aluminum Foil and Trays, Other Glass, Hazardous/Special Waste, Small Appliances, Household Batteries, Furniture, Tires and Rubber, Other Organics, Composite Materials, Grit, and Liquids
[7]Columns may not appear to sum correctly due to rounding

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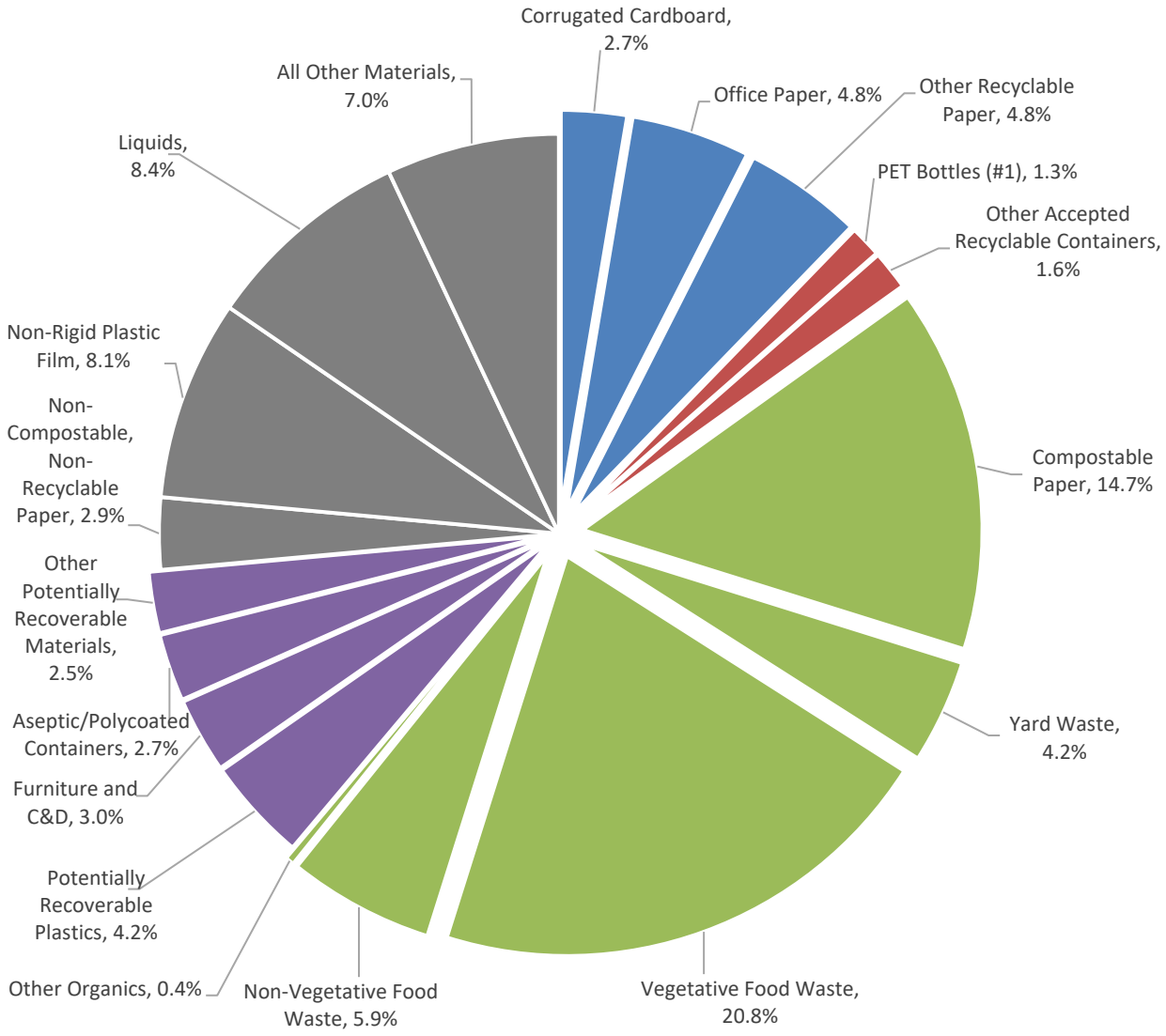
3.6 Aggregate WCPSS Waste

Figure 3-4 depicts the weighted average composition of aggregate WCPSS waste. Table 3-8 provides the weighted average with a 90 percent confidence interval for each material category measured in the aggregate waste. Table 3-9 compares the composition of aggregate waste from the current WCS to the 2014 and 2008 WCS. Individual sample results are included in Appendix C.

Key findings from the aggregate results are as follows:

- Nearly half of the waste was potentially compostable material.
  - Most of this was food waste.
  - Compostable paper was the second most prominent potentially compostable material, and second highest material category overall.
  - Yard waste was about 4 percent of the waste, but this is due to the High Schools – North load with an exceptionally high percentage of yard waste. In fact, yard waste was not found in any sample from other loads.
- Other potentially recoverable materials comprised over 12 percent of the waste. Almost 3 percent of the stream was unaccepted plastic containers. Aseptic/ polycoated containers were another major component at about another 3 percent of the waste.
- Recyclable paper comprised about 12 percent of the waste stream. About three-quarters of this was office paper and mixed recyclable paper.
- Only about 3 percent of the waste was recyclable containers accepted in the "Feed the Bin" program. PET bottles had the highest percentage in this group, followed by tin/steel cans.
- All other materials were about 26 percent of the waste. Liquids and non-rigid plastic film were the majority of this category. Liquids mainly consisted of the contents of unopened or partially full milk and juice cartons.
- Comparing the current WCS to the 2014 and 2008 WCS:
  - The percentage of food waste has continued to increase in each WCS.
  - The percentage of recyclable paper has decreased in each subsequent WCS.
  - Aseptic/polycoated containers has a much lower percentage than previous WCSs.

Figure 3-4: Composition of Aggregate WCPSS Waste



Notes: For this figure, the following categories have been combined:

- Other Recyclable Paper includes the categories of Newspaper, Softcover Textbooks, and Mixed Recyclable Paper
- Other Accepted Recyclable Containers includes HDPE Bottles (#2), Non-Bottle HDPE Containers (#2), Other Bottles, Tubs, Jugs, and Jars, Tin/Steel Cans, Aluminum Cans, and Glass Containers
- Potentially Recoverable Plastics includes Non-Bottle PET Containers (#1), Unaccepted Plastic Containers, and Bulky Rigid Plastics
- Other Potentially Recoverable Materials includes Ferrous Scrap Metals, Aluminum Foil and Trays, Non-Ferrous Scrap Metals, Textiles/Leather, Hazardous/Special Waste, Small Appliances, and Electronics
- All Other Materials includes Expanded Polystyrene Foam, All Other Plastics, Other Glass, Household Batteries, Tires and Rubber, Composite Materials, Grit

Table 3-8: Composition of Aggregate WCPSS Waste

Material Category	Weighted Average	90% Confidence Interval	
		Lower Bounds	Upper Bounds
Newspaper	0.0%	0.0%	0.0%
Corrugated Cardboard	2.7%	1.8%	3.5%
Office Paper	4.8%	3.3%	6.3%
Softcover Textbooks	0.2%	0.0%	0.5%
Mixed Recyclable Paper	4.5%	3.5%	5.5%
Accepted Recyclable Paper	**12.2%**	**10.1%**	**14.4%**
PET Bottles (#1)	1.3%	0.9%	1.6%
HDPE Bottles (#2)	0.2%	0.1%	0.3%
Non-Bottle HDPE Containers (#2)	0.1%	0.1%	0.2%
Other Bottles, Tubs, Jugs, and Jars	0.1%	0.1%	0.1%
Tin/Steel Cans	0.6%	0.3%	0.8%
Aluminum Cans	0.3%	0.3%	0.4%
Glass Containers	0.3%	0.1%	0.4%
Accepted Recyclable Containers	**2.9%**	**2.4%**	**3.3%**
Compostable Paper	14.7%	13.5%	16.0%
Yard Waste	4.2%	1.0%	7.4%
Vegetative Food Waste	20.8%	18.5%	23.1%
Non-Vegetative Food Waste	5.9%	5.0%	6.9%
Other Organics	0.4%	0.1%	0.6%
Potentially Compostable Materials	**46.0%**	**42.7%**	**49.4%**
Aseptic/Polycoated Containers	2.7%	2.6%	2.9%
Hardcover Textbooks	0.3%	0.0%	0.6%
Non-Bottle PET Containers (#1)	0.6%	0.5%	0.7%
Unaccepted Plastic Containers	2.9%	2.5%	3.3%
Bulky Rigid Plastics	0.7%	0.4%	1.0%
Ferrous Scrap Metals	0.2%	0.1%	0.4%
Aluminum Foil and Trays	0.2%	0.2%	0.2%
Non-Ferrous Scrap Metals	0.1%	0.0%	0.2%
Textiles/Leather	0.9%	0.5%	1.2%
Hazardous/Special Waste	0.1%	0.0%	0.1%
Small Appliances	0.0%	-0.1%	0.2%
Electronics	0.7%	-0.5%	1.9%
C&D Debris	1.0%	0.4%	1.6%
Furniture	2.0%	0.3%	3.8%
Other Potentially Recoverable Materials	**12.4%**	**10.2%**	**14.7%**
Non-Compostable, Non-Recyclable Paper	2.9%	2.3%	3.5%
Expanded Polystyrene Foam	0.3%	0.1%	0.4%
Non-Rigid Plastic Film	8.1%	7.6%	8.7%
All Other Plastics	1.4%	1.1%	1.7%
Other Glass	0.1%	0.0%	0.2%
Household Batteries	0.0%	0.0%	0.0%
Tires and Rubber	0.0%	0.0%	0.0%
Composite Materials	5.2%	4.4%	6.1%
Grit	0.0%	0.0%	0.0%
Liquids	8.4%	7.4%	9.5%
All Other Materials	**26.4%**	**24.6%**	**28.3%**
Total	**100.0%**		

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

Table 3-9: Comparison of Aggregate WCPSS Waste to 2014 & 2008 WCS

Material Category	2023 Weighted Average	2014 Weighted Average	2008 Weighted Average
Corrugated Cardboard	2.7%	2.1%	2.3%
Other Recyclable Paper[1]	9.6%	11.6%	13.5%
Textbooks[2]	0.3%	0.7%	0.1%
Aseptic/Polycoated Containers	2.7%	6.8%	6.7%
PET #1 Containers[3]	1.9%	2.3%	2.5%
HDPE #2 Containers[4]	0.3%	0.1%	0.6%
Expanded Polystyrene Foam	0.3%	1.3%	1.5%
Non-Rigid Plastic Film	8.1%	12.0%	6.1%
Aluminum Cans	0.3%	0.2%	0.4%
Tin/Steel Cans	0.6%	0.1%	0.3%
Other Metals[5]	0.3%	1.6%	0.6%
Glass Containers	0.3%	0.3%	0.5%
Textiles/Leather	0.9%	1.2%	N/A
Vegetative Food Waste	20.8%	16.8%	13.9%
Non-Vegetative Food Waste	5.9%	3.8%	
Compostable Paper	14.7%	14.0%	N/A
Yard Waste	4.2%	0.6%	0.3%
Electronics	0.7%	0.3%	0.3%
C&D Debris	1.0%	1.3%	1.2%
Non-Recyclable Waste[6]	24.4%	22.7%	49.1%
Totals[7]	**100%**	**100.0%**	**100.0%**

[1]Contains Mixed Paper, Office Paper, Newspaper, Magazines and Catalogs, Telephone Directories, and Other Recyclable Paper (previous WCSs categories)
[2]Assume Hardcover Textbooks
[3]Contains both PET Bottles and PET Non-Bottles
[4]Contains both HDPE Bottles and HDPE Non-Bottles
[5]Contains Ferrous and Non-Ferrous Scrap Metals
[6]Non Recyclable Waste Contains: Non-Compostable, Non-Recyclable Paper, Other Bottles, Tubs, Jugs, and Jars, Unaccepted Plastic Containers, Bulky Rigid Plastics, All Other Plastics, Aluminum Foil and Trays, Other Glass, Hazardous/Special Waste, Small Appliances, Household Batteries, Furniture, Tires and Rubber, Other Organics, Composite Materials, Grit, and Liquids
[7]Columns may not appear to sum correctly due to rounding

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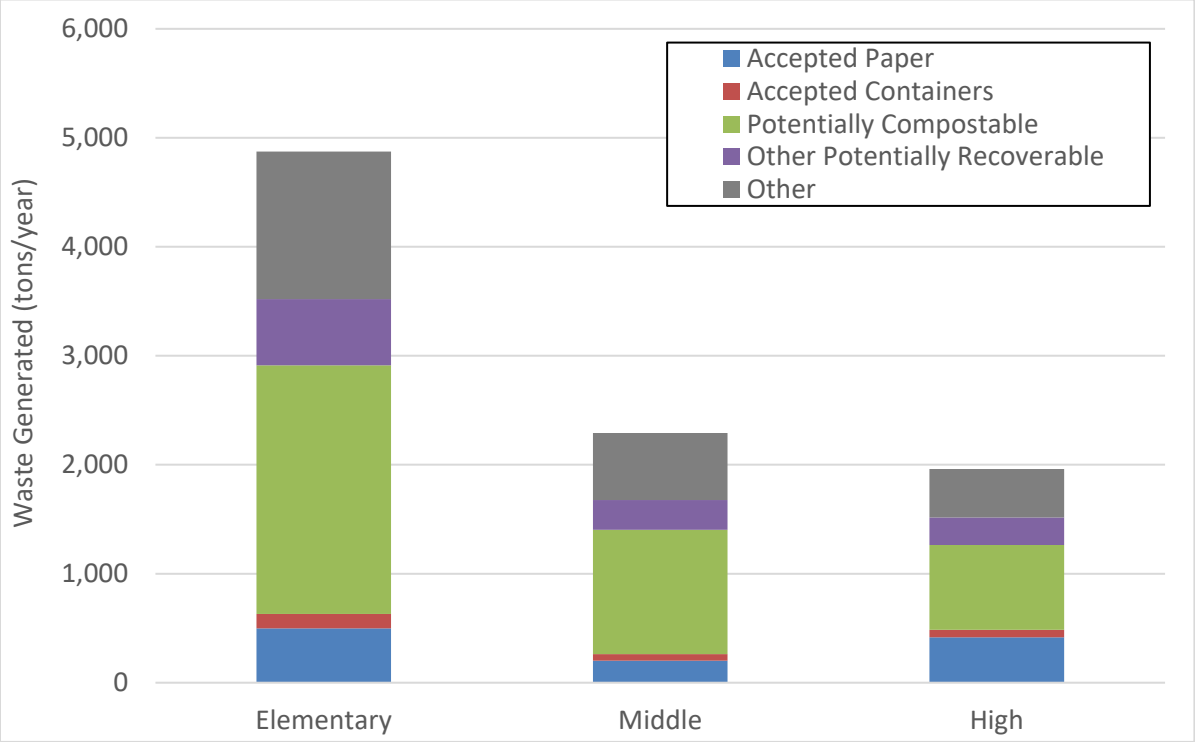
Section 4
Findings

This WCS provides the County and WCPSS with data to evaluate the performance of its "Feed the Bin" program and quantifies the types of materials accepted in the program that are remaining in the school waste stream. The WCS also measures other materials in the waste stream that have a potential to be recycled or recovered. This information helps to determine what materials to target to meet the waste diversion goals of the County and WCPSS.

Figure 4-1 depicts the total annual generation for each of the WCPSS school types and the portions of the waste stream that is accepted in the "Feed the Bin" program, potentially compostable, and potentially recoverable. This data is calculated by applying the average generation rate measured for each school group in this WCS to the total enrollment numbers of all schools of each type and extrapolating annually by 180 school days.

Figure 4-1: Total Waste Generation by School Type



Elementary schools: Average generation = 0.79 pounds/student/day, total enrollment = 68,635 students.
Middle schools: Average generation = 0.69 pounds/student/day, total enrollment = 36,759 students.
High schools: Average generation = 0.42 pounds/student/day, total enrollment = 52,418 students.

Overall findings and recommendations from the WCS include:

- Elementary schools generated more waste than the other two school groups combined.

- Potentially compostable material, especially food waste, was by far the most significant material in the waste stream. Food waste was much greater from elementary and middle schools than high schools.
    - This material could be diverted through on-campus organics collection (e.g., for composting either at the school itself or at a commercial compost operation). While most of the food waste was loose pre-consumer food prep waste (see photo in Appendix D) or post-consumer partially eaten food, KCI noticed an abundance of unopened single serving packages of vegetables and fruit or plastic serving cups with a lid containing various foods (see photos in Appendix D). In order for the packaged food to be composted, they would either need to be source separated or the commercial composter would have to have depackaging equipment.
    - Compostable paper was also a major component of the waste stream. This was mostly paper towels, napkins, and paper serving trays (see photo in Appendix D). While these materials may be technically compostable, the County and WCPSS would need to confirm with the commercial composter if these materials would be accepted in the volumes produced by the schools.
    - The yard waste found in the one load from high schools may have been due to a family-sponsored weekend cleanup at a campus or could have been due to residents or businesses in the area dumping waste in the school dumpsters.
- A combined 15 percent of the waste stream were materials accepted in the "Feed the Bin" (also including corrugated cardboard). The percentage of these materials was about twice as high in high schools as the other school groups.
    - Recyclable paper was the vast majority of these materials, mostly office paper and mixed recyclable paper. It appeared that these papers (given the large volume of paper in some cases) may have been generated from faculty rather than students. WCPSS could work with its faculty to evaluate what is needed to facilitate and encourage their usage of the "Feed the Bin" program.
    - Recyclable containers had an overall low percentage, less than 3 percent. PET bottles had the highest percentage. These could have been generated from student, faculty, or staff. The second highest percentage was tin/steel cans, which were primarily large cans from the cafeteria (see photo in Appendix D) Evaluation of the "Feed the Bin" program (i.e., bin placement, signage, etc.) may be warranted to better understand why these materials are in the waste stream and how to reduce this.
    - Analysis of the recyclables collected in the "Feed the Bin" and measuring the types and quantities of recyclables would give a more complete picture of the performance of the program and allow a capture rate to be calculated to measure the success of the program (i.e., how much of the total recyclables generated are captured in the program).
- Other potentially recoverable materials were about 12 percent of the waste stream, which was fairly consistent across all school types.

- Some of the materials, such as aseptic cartons and unaccepted plastic containers, which were mostly cups or trays for food service (see photo in Appendix D), are not currently accepted for recycling by the County's recyclables processor. These comprise about 6 percent of the waste stream. If these materials are accepted in the future or the County finds a processor that does accept them, they could be included in the "Feed the Bin" program.
- Other materials, such as textiles, scrap metal, and electronics, are accepted at the County's convenience centers. WCPSS could work with the County's vendor that processes these materials from the convenience centers to set up a program to receive these materials from schools.

The WCS represents a snapshot of the waste stream at the time the WCS was conducted. Additional studies, particularly an in-depth study on generation rates and the recycling stream from the schools, could help further develop the results of this WCS. KCI appreciates the opportunity to again work with the County and WCPSS and looks forward to assisting with their future solid waste and recycling efforts.

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Appendix A:
Wake County Public School System
2023 Waste Composition Study
Material Categories Descriptions

Table A-1: Material Categories Descriptions

#	Material Categories	Description of Categories
1	**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.
2	**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.
3	**Office Paper**	Printed or unprinted paper typically generated in an office environment including white, colored, coated and uncoated papers, and manila and pastel colored file folders.
4	**Hardcover Textbooks**	All hardcover textbooks and other books.
5	**Softcover Textbooks**	All softcover textbooks and other books.
6	**Mixed Recyclable Paper**	Telephone books, catalogs, Kraft paper, brown paper bags, magazines, telephone books, catalogs, paperboard, chipboard, mail, blueprints, and other printed material on glossy and non-glossy paper. *Does not include shredded, contaminated, waxy, or metallic paper.*
7	**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.
8	**Non-Compostable, Non-Recyclable Paper**	Non-compostable, non-recyclable paper products with a heavy plastic coating (e.g., waxy or plastic-coated OCC, 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.
9	**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®).*
10	**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.*
11	**HDPE Bottles (#2)**	Clear/natural and opaque, pigmented bottles made of high-density polyethylene (HDPE #2). Examples include milk jugs, detergent bottles, etc. *Does not include loose caps and lids.*
12	**Non-Bottle PET Containers (#1)**	Clear and colored plastic non-bottle, non-jar containers coded PET #1. Examples include clamshell containers, lidded salad containers, and fruit or vegetable platters. Does not include plastic drink cups.
13	**Non-Bottle HDPE Containers (#2)**	Wide-mouthed tubs and containers coded HDPE #2. Examples include large plastic coffee containers and plastic chip tubes, including lids. Does not include plastic drink cups.

#	Material Categories	Description of Categories
14	**Other Bottles, Tubs, Jugs, and Jars**	Plastic containers coded #3, #4, #5, and #7 designed with a rigid plastic lid including narrow-neck bottles, wide-mouthed tubs, jars, and jugs.
15	**Unaccepted Plastic Containers**	Rigid plastic drink cups of any resin type, plastic trays and clamshells (besides #1 PET), small yogurt cups with a foil lids, flowerpots, and any container label #6 polystyrene (besides expanded polystyrene)
16	**Bulky Rigid Plastics**	Non-container rigid plastic items such as plastic drums, crates, buckets, baskets, toys, refuse totes, lawn furniture, laundry baskets, and other large plastic items. *Does not include electronic toys.*
17	**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.
18	**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).*
19	**All Other Plastics**	Any plastic materials not categorized above, such as deodorant cases, plastic utensils, straws, toothbrushes, broom heads, polypropylene foam products, etc.
20	**Tin/Steel Cans**	Tin-plated steel cans, usually food containers and aerosol cans, including labels. Also includes steel caps and lids.
21	**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.
22	**Aluminum Cans**	Aluminum soft drink, beer, and some food and aerosol cans.
23	**Aluminum Foil and Trays**	Aluminum foil and food trays, such as disposal pie plates and catering trays.
24	**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.
25	**Glass Containers**	Clear, green, blue, and amber glass bottles and jars, as well as pieces of broken glass bottles and jars.
26	**Other Glass**	Windowpanes, mirrors, ceramics, drinking glasses, and glass containers other than clear, green, blue, or amber.
27	**Textiles/Leather**	Clothing apparel, rags, leather, blankets, curtains, shoes, wallets, purses, belts, and scrap leather.
28	**Hazardous/Special Waste**	Potentially hazardous waste including cleaners, oil, paint, pesticides, pool chemicals, fluorescent lights, solvents, medical waste, and non-alkaline batteries.
29	**Small Appliances**	Household appliances such as coffee makers, microwaves, fans, irons, hair dryers, electrical kitchenware, and lamps.

#	Material Categories	Description of Categories
30	**Electronics**	Electronic devices including televisions, computers, cell phones, cordless telephones, handheld devices, etc.
31	**Household Batteries**	Non-rechargeable household batteries including AA, AAA, C, D, and 9-volt.
32	**C&D Debris**	Construction and demolition debris including lumber, concrete and other inert debris (brick, rocks, sand), carpet and padding, drywall, insulation, full and empty caulk tubes, paint supplies, and roofing materials.
33	**Furniture**	Any furniture or large pieces of furniture.
34	**Tires and Rubber**	Small and large tires and other items made of rubber.
35	**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.).
36	**Vegetative Food Waste**	Packaged or loose fruit, vegetable, or bread waste (includes coffee grounds and tea bags). Includes single-use coffee pods (i.e., K-cups).
37	**Non-Vegetative Food Waste**	Packaged or loose meat, dairy, or liquid food waste.
38	**Other Organics**	Other organic material such as pet waste (e.g., bagged dog waste and cat litter), natural fiber or wicker products, corks, lint, and hair.
39	**Composite Materials**	Products that are a composite of materials such as cigarette packages, diapers, binders, laminated paper, electrical devices and accessories other than electronics or small appliances, electronic media, extension cords, string lights, Pringle's® cans, foil-lined chip bags, etc.
40	**Grit**	Any grit or fines remaining on the sort table that cannot be defined in the other categories.
41	**Liquids**	All liquids found within containers.

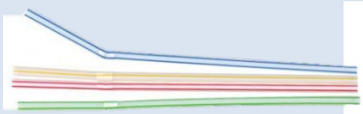
Appendix B:
Wake County Public School System
2023 Waste Composition Study
Material Categories Example Stock Photos

Table B-1: Material Categories Example Stock Photos

#	Material Categories	Example Stock Photos
1	**Newspaper**	 
2	**Corrugated Cardboard**	 
3	**Office Paper**	 
4	**Hard Cover Books**	
5	**Softcover Textbooks**	
6	**Mixed Recyclable Paper**	 

#	Material Categories	Example Stock Photos
7	**Compostable Paper**	
8	**Non-Compostable, Non-Recyclable Paper**	
9	**Aseptic Containers/Cartons**	
10	**PET Bottles (#1)**	
11	**HDPE Bottles (#2)**	

#	Material Categories	Example Stock Photos
12	**Non-Bottle PET Containers (#1)**	 
13	**Non-Bottle HDPE Containers (#2)**	 
14	**Other Bottles, Tubs, Jugs, and Jars**	  
15	**Unaccepted Plastic Containers**	 
16	**Bulky Rigid Plastics**	 
17	**Expanded Polystyrene (EPS) Foam**	 

#	Material Categories	Example Stock Photos
18	**Non-Rigid Plastic Film**	  
19	**All Other Plastics**	 
20	**Tin/Steel Cans**	
21	**Ferrous Scrap Metals**	
22	**Aluminum Cans**	 
23	**Aluminum Foil and Trays**	 

#	Material Categories	Example Stock Photos
24	**Non-Ferrous Scrap Metals**	
25	**Glass Containers**	 
26	**Other Glass**	 
27	**Textiles and Leather**	
28	**Hazardous/Special Wastes**	
29	**Small Appliances**	 

#	Material Categories	Example Stock Photos
30	**Electronics**	
31	**Household Batteries**	
32	**C&D Debris**	
33	**Furniture**	
34	**Tires and Rubber**	
35	**Yard Waste**	

#	Material Categories	Example Stock Photos
36	**Vegetative Food Waste**	
37	**Non-Vegetative Food Waste**	  
38	**Other Organics**	 
39	**Composite Materials**	  
40	**Grit**	
41	**Liquids**	

Appendix C:
Wake County Schools
2023 Waste Composition Study
Individual Sample Results

Table C-1: Individual Sample Results (% by Weight) – Elementary School - Central

Material Categories		Sample#	11	12	13	14	15	16
1	Newspaper		0.0%	0.0%	0.0%	0.0%	0.5%	0.0%
2	Corrugated Cardboard		1.2%	3.1%	8.8%	2.7%	5.2%	0.4%
3	Office Paper		0.9%	5.5%	2.2%	4.0%	7.6%	1.2%
4	Hardcover Textbooks		0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
5	Softcover Textbooks		1.0%	0.0%	0.0%	0.0%	0.0%	0.0%
6	Mixed Recyclable Paper		4.4%	10.0%	0.9%	3.3%	2.8%	6.3%
7	Compostable Paper		11.9%	10.7%	12.9%	12.1%	18.2%	17.4%
8	Non-Compostable, Non-Recyclable Paper		4.5%	5.4%	2.4%	3.6%	1.3%	4.2%
9	Aseptic/Polycoated Containers		1.9%	2.7%	4.2%	1.7%	3.4%	7.1%
10	PET Bottles (#1)		1.2%	0.8%	0.4%	1.3%	0.3%	0.5%
11	HDPE Bottles (#2)		0.4%	0.7%	0.0%	0.3%	0.1%	0.0%
12	Non-Bottle PET Containers (#1)		0.5%	0.7%	0.4%	0.7%	0.4%	0.0%
13	Non-Bottle HDPE Containers (#2)		0.2%	0.0%	0.4%	0.6%	0.2%	0.7%
14	Other Bottles, Tubs, Jugs, and Jars		0.0%	0.1%	0.0%	0.1%	0.0%	0.0%
15	Unaccepted Plastic Containers		2.2%	3.1%	3.2%	1.8%	3.7%	2.3%
16	Bulky Rigid Plastics		3.2%	0.2%	0.0%	0.0%	0.0%	0.0%
17	Expanded Polystyrene Foam (Styrofoam®)		0.2%	0.0%	0.1%	0.2%	0.0%	0.2%
18	Non-Rigid Plastic Film		8.7%	6.7%	8.6%	5.7%	6.8%	9.8%
19	All Other Plastics		1.4%	7.9%	0.8%	1.2%	1.0%	2.2%
20	Tin/Steel Cans		0.0%	0.0%	0.0%	5.1%	0.0%	0.0%
21	Ferrous Scrap Metals		0.0%	0.0%	0.0%	0.5%	0.0%	0.0%
22	Aluminum Cans		0.7%	0.4%	0.1%	0.1%	0.0%	0.4%
23	Aluminum Foil and Trays		0.3%	0.1%	0.3%	0.2%	0.0%	0.0%
24	Non-Ferrous Scrap Metals		2.5%	0.0%	0.0%	0.4%	0.0%	0.0%
25	Glass Containers		0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
26	Other Glass		0.1%	0.0%	0.0%	2.0%	0.0%	0.0%
27	Textiles/Leather		0.9%	0.2%	0.0%	1.4%	0.0%	0.0%
28	Hazardous/Special Waste		0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
29	Small Appliances		0.0%	0.0%	0.0%	0.5%	0.0%	0.0%
30	Electronics		5.6%	0.0%	0.0%	1.3%	0.0%	0.0%
31	Household Batteries		0.0%	0.0%	0.0%	0.0%	0.0%	0.1%
32	C&D Debris		2.1%	0.0%	0.0%	0.4%	0.0%	0.0%
33	Furniture		0.0%	0.0%	16.7%	7.1%	13.6%	0.0%
34	Tires and Rubber		0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
35	Yard Waste		0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
36	Vegetative Food Waste		16.5%	16.3%	16.9%	21.8%	18.2%	18.7%
37	Non-Vegetative Food Waste		13.0%	2.9%	5.8%	4.6%	4.4%	7.5%
38	Other Organics		1.2%	1.1%	0.0%	2.5%	0.0%	0.0%
39	Composite Materials		7.1%	11.2%	5.6%	7.0%	2.9%	3.7%
40	Grit		0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
41	Liquids		6.4%	9.9%	9.2%	5.7%	9.4%	17.5%
	Totals		**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**

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

Table C-2: Individual Sample Results (% by Weight) – Elementary Schools - North

Material Categories		Sample#	17	18	19	20	21	22	23
1	Newspaper		0.0%	0.0%	0.0%	0.0%	0.1%	0.0%	0.0%
2	Corrugated Cardboard		0.9%	0.9%	3.4%	6.0%	1.3%	0.0%	1.3%
3	Office Paper		2.7%	5.2%	0.0%	7.0%	7.3%	0.4%	4.9%
4	Hardcover Textbooks		0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
5	Softcover Textbooks		0.9%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
6	Mixed Recyclable Paper		0.6%	5.0%	1.2%	0.7%	3.8%	6.7%	4.8%
7	Compostable Paper		14.7%	18.7%	16.5%	13.6%	15.7%	17.5%	16.1%
8	Non-Compostable, Non-Recyclable Paper		2.0%	4.0%	1.6%	1.9%	2.0%	1.4%	3.1%
9	Aseptic/Polycoated Containers		4.5%	2.3%	4.2%	3.4%	3.3%	4.9%	3.8%
10	PET Bottles (#1)		0.5%	1.4%	0.2%	0.4%	1.0%	1.0%	0.7%
11	HDPE Bottles (#2)		0.1%	0.2%	0.6%	0.0%	0.5%	0.1%	0.3%
12	Non-Bottle PET Containers (#1)		0.4%	0.5%	0.7%	2.7%	0.4%	0.3%	0.7%
13	Non-Bottle HDPE Containers (#2)		0.0%	0.1%	0.0%	0.0%	0.2%	0.2%	0.1%
14	Other Bottles, Tubs, Jugs, and Jars		0.1%	0.2%	0.0%	0.0%	0.4%	0.1%	0.1%
15	Unaccepted Plastic Containers		2.5%	2.6%	2.4%	0.0%	3.8%	6.1%	3.9%
16	Bulky Rigid Plastics		0.0%	1.2%	0.8%	0.0%	2.2%	1.4%	1.2%
17	Expanded Polystyrene Foam (Styrofoam®)		0.0%	0.2%	0.1%	0.0%	0.4%	0.0%	0.0%
18	Non-Rigid Plastic Film		10.0%	10.7%	7.1%	8.8%	8.1%	7.5%	9.8%
19	All Other Plastics		0.9%	1.7%	0.5%	2.0%	1.5%	0.8%	1.4%
20	Tin/Steel Cans		2.1%	0.3%	0.8%	1.0%	1.2%	0.0%	0.5%
21	Ferrous Scrap Metals		0.0%	0.0%	0.0%	0.1%	0.0%	0.0%	0.0%
22	Aluminum Cans		0.0%	0.4%	0.1%	0.2%	0.4%	0.3%	0.6%
23	Aluminum Foil and Trays		0.2%	0.1%	0.3%	0.3%	0.0%	0.1%	0.3%
24	Non-Ferrous Scrap Metals		0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
25	Glass Containers		0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	1.0%
26	Other Glass		0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
27	Textiles/Leather		0.5%	3.1%	0.2%	0.2%	0.0%	0.1%	0.0%
28	Hazardous/Special Waste		0.0%	0.0%	0.0%	0.7%	0.0%	0.0%	0.0%
29	Small Appliances		0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
30	Electronics		0.1%	0.4%	0.0%	0.3%	0.2%	0.0%	0.0%
31	Household Batteries		0.0%	0.0%	0.0%	0.0%	0.1%	0.0%	0.1%
32	C&D Debris		0.0%	0.0%	0.0%	0.0%	0.0%	6.3%	0.0%
33	Furniture		0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
34	Tires and Rubber		0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
35	Yard Waste		0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
36	Vegetative Food Waste		29.9%	22.3%	27.4%	29.4%	24.0%	19.4%	21.3%
37	Non-Vegetative Food Waste		9.1%	2.4%	16.6%	10.9%	2.5%	9.5%	4.9%
38	Other Organics		0.0%	0.0%	0.0%	0.0%	0.0%	0.4%	0.0%
39	Composite Materials		2.7%	11.9%	2.5%	3.3%	5.8%	4.7%	6.4%
40	Grit		0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
41	Liquids		14.7%	4.0%	12.7%	7.1%	13.7%	10.8%	12.3%
	Totals		**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**

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

Table C-3: Individual Sample Results (% by Weight) – Elementary Schools - South

Material Categories		Sample#	29	30	31	32	33	34	35
1	Newspaper		0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
2	Corrugated Cardboard		0.5%	1.8%	0.0%	1.9%	1.2%	2.0%	1.2%
3	Office Paper		1.2%	0.5%	2.2%	7.8%	5.3%	5.8%	0.5%
4	Hardcover Textbooks		0.0%	0.0%	0.0%	3.5%	0.0%	0.0%	0.0%
5	Softcover Textbooks		5.1%	0.0%	0.4%	0.0%	0.0%	0.0%	0.0%
6	Mixed Recyclable Paper		4.5%	3.1%	7.4%	8.1%	5.9%	4.4%	1.0%
7	Compostable Paper		16.6%	19.9%	16.4%	15.4%	16.6%	16.2%	15.9%
8	Non-Compostable, Non-Recyclable Paper		3.3%	2.4%	3.0%	4.3%	2.4%	1.6%	1.0%
9	Aseptic/Polycoated Containers		2.3%	4.1%	2.4%	1.1%	4.1%	3.1%	3.6%
10	PET Bottles (#1)		0.7%	0.6%	1.4%	2.0%	0.7%	0.6%	0.7%
11	HDPE Bottles (#2)		0.0%	0.0%	0.5%	0.4%	0.1%	0.7%	0.1%
12	Non-Bottle PET Containers (#1)		0.4%	0.8%	0.8%	0.5%	0.5%	0.9%	0.9%
13	Non-Bottle HDPE Containers (#2)		0.0%	0.1%	0.4%	0.7%	0.0%	0.0%	0.0%
14	Other Bottles, Tubs, Jugs, and Jars		0.1%	0.0%	0.1%	0.4%	0.2%	0.2%	0.0%
15	Unaccepted Plastic Containers		3.9%	5.4%	4.0%	2.9%	6.5%	5.2%	3.8%
16	Bulky Rigid Plastics		0.6%	1.5%	0.4%	0.0%	0.0%	0.4%	1.3%
17	Expanded Polystyrene Foam (Styrofoam®)		0.2%	0.0%	0.1%	0.3%	0.1%	0.2%	0.1%
18	Non-Rigid Plastic Film		8.6%	8.3%	8.2%	8.1%	8.6%	9.0%	9.3%
19	All Other Plastics		2.3%	1.1%	1.4%	1.2%	1.8%	1.4%	0.7%
20	Tin/Steel Cans		0.4%	1.8%	0.0%	0.4%	0.0%	1.4%	0.0%
21	Ferrous Scrap Metals		0.6%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
22	Aluminum Cans		0.0%	0.2%	0.6%	0.0%	0.4%	0.6%	0.3%
23	Aluminum Foil and Trays		0.3%	0.2%	0.1%	0.1%	0.1%	0.1%	0.5%
24	Non-Ferrous Scrap Metals		0.0%	0.0%	0.0%	0.1%	0.0%	0.0%	0.0%
25	Glass Containers		1.0%	0.0%	0.0%	1.3%	0.0%	2.0%	0.5%
26	Other Glass		0.0%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%
27	Textiles/Leather		0.4%	0.0%	0.1%	0.0%	0.5%	0.0%	0.2%
28	Hazardous/Special Waste		0.2%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
29	Small Appliances		0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
30	Electronics		0.5%	0.0%	0.0%	0.1%	0.0%	0.1%	0.0%
31	Household Batteries		0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
32	C&D Debris		1.1%	0.0%	0.0%	0.0%	0.0%	0.0%	7.7%
33	Furniture		0.0%	0.0%	9.1%	0.0%	0.0%	0.0%	0.0%
34	Tires and Rubber		0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
35	Yard Waste		0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
36	Vegetative Food Waste		20.4%	29.2%	20.6%	18.1%	24.5%	23.3%	32.6%
37	Non-Vegetative Food Waste		12.9%	4.9%	7.4%	4.0%	8.0%	5.3%	8.1%
38	Other Organics		0.1%	0.0%	0.0%	6.2%	0.2%	0.6%	0.0%
39	Composite Materials		7.0%	3.1%	6.4%	8.1%	5.5%	7.8%	3.3%
40	Grit		0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
41	Liquids		4.9%	10.7%	6.6%	3.1%	6.9%	7.0%	6.5%
	Totals		**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**

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

Table C-4: Individual Sample Results (% by Weight) – Middle Schools - North

Material Categories		Sample#	24	25	26	27	28
1	Newspaper		0.0%	0.0%	0.0%	0.0%	0.0%
2	Corrugated Cardboard		0.3%	1.1%	0.3%	0.0%	6.5%
3	Office Paper		18.1%	1.6%	0.2%	2.1%	1.4%
4	Hardcover Textbooks		0.0%	6.2%	0.0%	0.0%	0.0%
5	Softcover Textbooks		0.0%	0.0%	0.0%	0.4%	0.0%
6	Mixed Recyclable Paper		14.2%	1.0%	2.9%	1.4%	1.1%
7	Compostable Paper		13.8%	13.5%	17.5%	21.9%	15.3%
8	Non-Compostable, Non-Recyclable Paper		1.7%	2.1%	1.9%	1.3%	1.0%
9	Aseptic/Polycoated Containers		1.7%	2.9%	3.2%	4.2%	3.1%
10	PET Bottles (#1)		1.3%	1.2%	1.3%	0.8%	1.1%
11	HDPE Bottles (#2)		0.0%	0.0%	0.1%	0.3%	0.0%
12	Non-Bottle PET Containers (#1)		0.0%	0.8%	1.4%	1.4%	0.0%
13	Non-Bottle HDPE Containers (#2)		0.1%	0.0%	0.1%	0.0%	0.0%
14	Other Bottles, Tubs, Jugs, and Jars		0.0%	0.0%	0.0%	0.0%	0.1%
15	Unaccepted Plastic Containers		2.8%	2.3%	3.5%	4.9%	2.4%
16	Bulky Rigid Plastics		0.3%	0.0%	0.7%	0.0%	0.4%
17	Expanded Polystyrene Foam (Styrofoam®)		0.1%	0.2%	0.1%	0.8%	0.1%
18	Non-Rigid Plastic Film		6.9%	9.0%	11.9%	8.4%	9.6%
19	All Other Plastics		2.8%	0.7%	0.6%	1.3%	0.8%
20	Tin/Steel Cans		0.3%	0.0%	0.4%	0.0%	2.0%
21	Ferrous Scrap Metals		1.8%	0.0%	0.1%	0.0%	0.0%
22	Aluminum Cans		0.8%	0.4%	0.2%	0.4%	0.2%
23	Aluminum Foil and Trays		0.2%	0.1%	0.3%	0.3%	0.1%
24	Non-Ferrous Scrap Metals		0.0%	0.0%	0.0%	0.0%	0.0%
25	Glass Containers		0.6%	0.3%	0.0%	0.3%	0.0%
26	Other Glass		0.0%	0.0%	0.0%	0.0%	0.0%
27	Textiles/Leather		0.3%	0.0%	0.4%	0.2%	0.0%
28	Hazardous/Special Waste		0.0%	0.0%	0.0%	0.0%	0.0%
29	Small Appliances		0.0%	0.0%	0.0%	0.0%	0.0%
30	Electronics		0.0%	1.0%	0.0%	0.0%	0.0%
31	Household Batteries		0.0%	0.0%	0.0%	0.0%	0.0%
32	C&D Debris		0.0%	11.0%	0.3%	0.0%	0.0%
33	Furniture		0.0%	0.0%	0.0%	0.0%	0.0%
34	Tires and Rubber		0.0%	0.0%	0.0%	0.0%	0.0%
35	Yard Waste		0.0%	0.0%	0.0%	0.0%	0.0%
36	Vegetative Food Waste		13.0%	27.2%	32.6%	26.4%	30.9%
37	Non-Vegetative Food Waste		6.0%	6.6%	6.3%	7.0%	8.3%
38	Other Organics		0.5%	0.0%	0.0%	0.0%	0.0%
39	Composite Materials		2.4%	3.0%	2.3%	4.3%	3.2%
40	Grit		0.0%	0.0%	0.0%	0.0%	0.0%
41	Liquids		10.1%	7.9%	11.4%	12.0%	12.4%
	Totals		**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**

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

Table C-5: Individual Sample Results (% by Weight) – Middle Schools - South

Material Categories		Sample#	36	37	38	39	40
1	Newspaper		0.0%	0.0%	0.1%	0.0%	0.0%
2	Corrugated Cardboard		1.0%	2.7%	5.7%	0.4%	1.3%
3	Office Paper		0.2%	2.3%	3.1%	0.5%	1.4%
4	Hardcover Textbooks		0.0%	0.0%	0.0%	0.0%	0.0%
5	Softcover Textbooks		0.0%	0.3%	0.0%	0.0%	0.0%
6	Mixed Recyclable Paper		0.6%	2.4%	3.0%	2.8%	0.8%
7	Compostable Paper		20.5%	15.8%	13.5%	16.0%	24.2%
8	Non-Compostable, Non-Recyclable Paper		0.8%	3.6%	1.2%	2.2%	0.7%
9	Aseptic/Polycoated Containers		3.4%	1.8%	1.8%	1.6%	2.3%
10	PET Bottles (#1)		1.8%	2.4%	1.4%	1.8%	1.2%
11	HDPE Bottles (#2)		0.1%	0.0%	0.2%	0.4%	0.0%
12	Non-Bottle PET Containers (#1)		0.5%	0.5%	0.8%	0.4%	0.5%
13	Non-Bottle HDPE Containers (#2)		0.0%	0.0%	0.1%	0.0%	0.1%
14	Other Bottles, Tubs, Jugs, and Jars		0.0%	0.0%	0.1%	0.2%	0.1%
15	Unaccepted Plastic Containers		1.7%	4.6%	3.5%	2.7%	4.4%
16	Bulky Rigid Plastics		1.1%	0.0%	0.1%	0.0%	0.4%
17	Expanded Polystyrene Foam (Styrofoam®)		0.1%	0.4%	3.9%	0.7%	0.1%
18	Non-Rigid Plastic Film		7.2%	11.1%	8.1%	10.7%	8.2%
19	All Other Plastics		0.7%	1.4%	1.7%	1.7%	0.8%
20	Tin/Steel Cans		0.0%	0.1%	1.9%	0.0%	0.0%
21	Ferrous Scrap Metals		0.1%	2.6%	0.0%	0.0%	0.0%
22	Aluminum Cans		0.3%	0.5%	0.5%	0.4%	0.3%
23	Aluminum Foil and Trays		0.2%	0.2%	0.3%	0.2%	0.3%
24	Non-Ferrous Scrap Metals		0.0%	0.0%	0.0%	0.0%	0.0%
25	Glass Containers		0.0%	0.0%	0.1%	0.9%	0.0%
26	Other Glass		0.0%	0.0%	0.0%	0.0%	0.0%
27	Textiles/Leather		0.0%	0.0%	1.8%	0.0%	1.3%
28	Hazardous/Special Waste		0.0%	0.0%	0.0%	0.2%	0.0%
29	Small Appliances		0.0%	0.0%	0.0%	0.0%	0.0%
30	Electronics		0.0%	0.0%	0.0%	0.0%	0.0%
31	Household Batteries		0.0%	0.0%	0.0%	0.0%	0.0%
32	C&D Debris		0.0%	0.0%	0.4%	0.4%	0.2%
33	Furniture		0.0%	0.0%	3.0%	18.0%	0.0%
34	Tires and Rubber		0.0%	0.0%	0.0%	0.0%	0.0%
35	Yard Waste		0.0%	0.0%	0.0%	0.0%	0.0%
36	Vegetative Food Waste		34.7%	22.8%	27.0%	20.4%	31.6%
37	Non-Vegetative Food Waste		6.6%	3.8%	5.1%	4.9%	5.7%
38	Other Organics		0.0%	0.4%	0.0%	0.0%	0.0%
39	Composite Materials		4.3%	10.3%	5.0%	3.6%	8.3%
40	Grit		0.0%	0.0%	0.0%	0.0%	0.0%
41	Liquids		14.1%	10.0%	6.8%	8.8%	5.7%
	Totals		**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**

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

Table C-6: Individual Sample Results (% by Weight) – High Schools - North

Material Categories		Sample#	1	2	3	4	5
1	Newspaper		0.0%	0.0%	0.0%	0.0%	0.3%
2	Corrugated Cardboard		4.5%	4.0%	12.5%	1.2%	2.9%
3	Office Paper		5.9%	6.3%	1.1%	10.5%	24.3%
4	Hardcover Textbooks		0.0%	0.0%	0.0%	0.0%	0.0%
5	Softcover Textbooks		0.0%	0.0%	0.0%	0.0%	0.0%
6	Mixed Recyclable Paper		6.7%	8.1%	3.1%	10.5%	8.8%
7	Compostable Paper		1.2%	10.3%	12.9%	18.8%	3.7%
8	Non-Compostable, Non-Recyclable Paper		1.0%	1.6%	4.9%	2.9%	12.7%
9	Aseptic/Polycoated Containers		0.3%	0.9%	1.6%	1.9%	0.1%
10	PET Bottles (#1)		0.3%	3.1%	1.5%	3.8%	1.4%
11	HDPE Bottles (#2)		0.2%	0.1%	0.2%	0.3%	0.0%
12	Non-Bottle PET Containers (#1)		0.0%	0.4%	0.3%	0.7%	0.0%
13	Non-Bottle HDPE Containers (#2)		0.0%	0.3%	0.0%	0.1%	0.0%
14	Other Bottles, Tubs, Jugs, and Jars		0.0%	0.7%	0.0%	0.0%	0.1%
15	Unaccepted Plastic Containers		0.3%	0.8%	1.4%	1.4%	0.4%
16	Bulky Rigid Plastics		0.9%	0.0%	0.3%	5.7%	0.0%
17	Expanded Polystyrene Foam (Styrofoam®)		0.2%	0.2%	0.2%	0.3%	0.3%
18	Non-Rigid Plastic Film		1.8%	5.7%	6.8%	11.3%	3.1%
19	All Other Plastics		0.6%	1.3%	2.2%	1.5%	0.5%
20	Tin/Steel Cans		0.1%	0.1%	0.2%	0.0%	0.5%
21	Ferrous Scrap Metals		0.0%	1.6%	0.0%	0.0%	0.7%
22	Aluminum Cans		0.2%	0.2%	0.3%	0.6%	0.3%
23	Aluminum Foil and Trays		0.0%	0.1%	0.2%	0.1%	0.1%
24	Non-Ferrous Scrap Metals		0.6%	0.0%	0.0%	0.0%	0.1%
25	Glass Containers		0.0%	0.5%	0.0%	0.0%	0.2%
26	Other Glass		0.0%	0.3%	0.0%	0.0%	0.0%
27	Textiles/Leather		0.6%	2.0%	4.6%	5.7%	3.3%
28	Hazardous/Special Waste		0.8%	0.1%	0.2%	0.2%	0.0%
29	Small Appliances		0.0%	0.0%	0.0%	0.0%	0.0%
30	Electronics		0.0%	2.4%	0.0%	0.0%	0.9%
31	Household Batteries		0.0%	0.0%	0.0%	0.1%	0.1%
32	C&D Debris		0.9%	0.0%	0.0%	0.1%	2.4%
33	Furniture		0.0%	1.0%	0.0%	0.0%	0.0%
34	Tires and Rubber		0.0%	0.0%	0.0%	0.0%	0.0%
35	Yard Waste		67.6%	25.0%	20.2%	0.0%	20.9%
36	Vegetative Food Waste		1.7%	11.0%	15.4%	13.9%	2.1%
37	Non-Vegetative Food Waste		0.2%	1.1%	1.2%	3.7%	0.5%
38	Other Organics		0.0%	0.4%	0.1%	0.0%	0.3%
39	Composite Materials		2.9%	4.5%	4.0%	4.6%	5.6%
40	Grit		0.0%	0.0%	0.0%	0.0%	0.0%
41	Liquids		0.7%	5.9%	4.7%	0.0%	3.3%
	Totals		**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**

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

Table C-7: Individual Sample Results (% by Weight) – High Schools - South

Material Categories		Sample#	6	7	8	9	10
1	Newspaper		0.0%	0.0%	0.0%	0.0%	0.0%
2	Corrugated Cardboard		11.3%	0.3%	10.8%	0.6%	2.9%
3	Office Paper		1.4%	2.2%	6.9%	5.7%	23.6%
4	Hardcover Textbooks		0.0%	0.0%	3.2%	0.0%	0.0%
5	Softcover Textbooks		0.0%	0.0%	2.5%	0.0%	0.0%
6	Mixed Recyclable Paper		15.8%	1.5%	3.0%	1.8%	3.6%
7	Compostable Paper		7.8%	14.0%	10.3%	6.0%	7.9%
8	Non-Compostable, Non-Recyclable Paper		6.6%	9.4%	4.2%	5.7%	4.0%
9	Aseptic/Polycoated Containers		0.6%	0.5%	1.6%	1.0%	0.4%
10	PET Bottles (#1)		3.3%	7.2%	2.2%	2.3%	2.1%
11	HDPE Bottles (#2)		0.0%	0.4%	0.0%	0.1%	0.5%
12	Non-Bottle PET Containers (#1)		0.2%	0.5%	0.7%	0.2%	0.3%
13	Non-Bottle HDPE Containers (#2)		0.1%	0.0%	0.0%	0.0%	0.0%
14	Other Bottles, Tubs, Jugs, and Jars		0.1%	0.1%	0.1%	0.2%	0.2%
15	Unaccepted Plastic Containers		3.1%	1.3%	0.8%	0.8%	0.8%
16	Bulky Rigid Plastics		0.0%	0.0%	0.0%	0.3%	0.0%
17	Expanded Polystyrene Foam (Styrofoam®)		0.1%	0.8%	0.3%	0.1%	0.3%
18	Non-Rigid Plastic Film		7.8%	7.6%	8.9%	5.0%	4.2%
19	All Other Plastics		0.0%	1.4%	3.2%	1.0%	0.6%
20	Tin/Steel Cans		0.0%	0.1%	0.1%	0.0%	0.1%
21	Ferrous Scrap Metals		0.0%	0.0%	0.0%	0.0%	0.0%
22	Aluminum Cans		0.4%	1.1%	0.4%	0.2%	0.6%
23	Aluminum Foil and Trays		0.3%	0.2%	0.2%	0.1%	0.1%
24	Non-Ferrous Scrap Metals		0.0%	0.0%	0.3%	0.0%	0.0%
25	Glass Containers		1.8%	0.0%	0.0%	0.0%	0.5%
26	Other Glass		0.0%	0.0%	0.0%	0.0%	0.0%
27	Textiles/Leather		2.6%	1.0%	0.0%	0.7%	0.3%
28	Hazardous/Special Waste		0.0%	0.0%	0.0%	0.0%	0.0%
29	Small Appliances		0.0%	0.0%	0.0%	3.3%	0.0%
30	Electronics		0.4%	2.6%	0.0%	28.0%	0.0%
31	Household Batteries		0.0%	0.0%	0.0%	0.1%	0.0%
32	C&D Debris		1.8%	0.0%	0.0%	0.4%	1.4%
33	Furniture		0.0%	0.0%	14.2%	11.0%	28.5%
34	Tires and Rubber		0.0%	0.0%	0.0%	0.0%	0.0%
35	Yard Waste		0.0%	0.0%	0.0%	0.0%	0.0%
36	Vegetative Food Waste		5.0%	9.9%	13.8%	10.7%	3.4%
37	Non-Vegetative Food Waste		3.6%	7.2%	1.9%	2.3%	1.5%
38	Other Organics		0.0%	0.0%	0.0%	0.8%	0.1%
39	Composite Materials		11.6%	17.2%	5.5%	3.3%	1.9%
40	Grit		0.0%	0.0%	0.0%	0.0%	0.0%
41	Liquids		14.5%	13.7%	5.1%	8.2%	10.2%
	Totals		**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**

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

Appendix D:
Wake County Public School System
2023 Waste Composition Study
Select Material & Load Photos

Unaccepted Plastic Containers

Paper Lunch Trays

Milk Cartons

Large Flat Screen TV

Packaged Vegetables

Other Packaged Food Waste

Pre-Consumer Food Waste

Liquids in One Sample

Large Tin/Steel Cans

Compostable Paper in One Sample

Elementary Schools – Central Load

Elementary Schools – South Load

Middle Schools – North Load

Middle Schools – South Load

High Schools – North Load

Note: A photo was inadvertently not taken of the Elementary Schools – North Load

High Schools – South Load