kessler consulting inc.
innovative waste solutions

TECHNICAL MEMORANDUM

TO: Shannon Culpepper, Chatham County, Waste Reduction Coordinator

FROM: Ryan Graunke, Consultant

DATE: September 27, 2019

SUBJ: Chatham County 2019 Mixed Recyclables Characterization Study

PROJ #: 155-02.00

Kessler Consulting, Inc. (KCI) is pleased to submit this technical memorandum to Chatham County (County) summarizing the Recyclables Characterization Study (RCS) conducted in September 2019.

Background and Purpose

The County owns and operates twelve collection centers located throughout the County at which residents can drop-off solid waste and recyclables. Recyclable paper, plastic, and metal are collected commingled while glass is collected separately. Four of the centers collect mixed recyclables in compactors, while the other eight collect mixed recyclables in A-frame containers. All twelve centers also have a spare A-frame container for overflow recyclables when the compactor or main A-frame is full or being tipped. In addition to the twelve centers, the County's Solid Waste & Recycling Office (Main Facility) has an A-frame container for mixed recyclables.

When full, the County hauls A-frame containers to the County's recyclables transfer station where they are tipped and loaded into a compactor which is transferred to Sonoco's material recovery facility (MRF) in Raleigh. The County hauls compactors from the centers directly to the MRF.

The purpose of the RCS is to evaluate the composition of mixed recyclables collected at the County's collection centers (recyclable glass was not included in the RCS). The composition will be used by the County for upcoming contract negotiations with Sonoco. Additionally, the County will be able to target specific materials and specific collection centers in its educational efforts to reduce contamination of its mixed recyclables.

Methodology

The RCS was conducted from September 4 – 6, 2019 at the County's transfer station, located at 28 County Services Road, Pittsboro, North Carolina. Over the course of the three-day RCS, all compactors and A-frame containers with mixed recyclables from each collection center were tipped at the transfer station for sampling. Prior to the study, the County reduced the frequency of container pulls to ensure a sufficient amount of material was collected for sampling. Once tipped at the transfer station, the load was mixed with a bucket loader and a sample, weighing approximately 150 pounds, was randomly

pulled from the mixed load. The sample was then staged for sorting. Table 1 listed each collection center and container, the day it was pulled for the RCS, and the total annual tons (July 2018 – June 2019) collected from the containers (used for statistical analysis discussed below).

Table 1: Sampling Schedule and Annual Tonnage

Collection Center	Container	Tonnage (7/18-6/19)	Wed	Thu	Fri
Asbury	Main	34.7	x		
	Spare	5.0			x
Bennett	Main	18.2	x		
	Spare	0.8		x	
Bonlee	Compactor	53.6		x	
	Spare	1.3			x
Cole Park	Compactor	403.8	x		
	Spare	40.2		x	
Crutchfield Crossroads	Main	35.9		x*	
	Spare	4.4		x*	
Goldston	Main	31.0	x		
	Spare	6.1			x
Hadley	Main	45.7			x
	Spare	30.4	x		
Harper's Crossroads	Main	24.3	x		
	Spare	2.2		x	
Martha's Chapel	Main	61.3			x
	Spare	49.0	x		
Moncure	Main	31.4		x	
	Spare	10.4		x	
Pittsboro	Compactor	277.7	x		
	Spare	7.6	x		
Siler City	Compactor	110.3		x	
	Spare	6.1		x	
Main Facility	Main	20.7			x
Total		**1,311.9**	**9**	**10**	**6**

*Due to a small amount of material in the Crutchfield Crossing's spare container, contents from the main and spare containers were combined and two samples were pulled. The average tonnage of the two containers was used for weighting the composition.

Each sample from each container was hand-sorted into 39 material categories according to the *Sampling and Sorting Protocol* approved by the County prior to the RCS. Material categories and their definitions can be found in Appendix A. Throughout the work of sorting each sample, the KCI field manager oversaw a sorting crew and examined all sorting bins to ensure accurate sorting of all material categories. The weight of each sorted material was then recorded for each sample.

Following completion of the fieldwork, KCI combined the results from all 25 samples and calculated the overall weighted average composition of mixed recyclables based on the total annual tonnage of each container. This ensures the composition of any individual container is not over or underrepresented. A 90 percent confidence interval was also calculated, using a standard statistical t-test, for each material

category. 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

Figure 1 (page 4) depicts the weighted average composition of the County's mixed recyclables. Table 2 (page 5) provides the weighted average with a 90 percent confidence interval for each material category measured in the RCS. Individual sample results are provided in Appendix B.

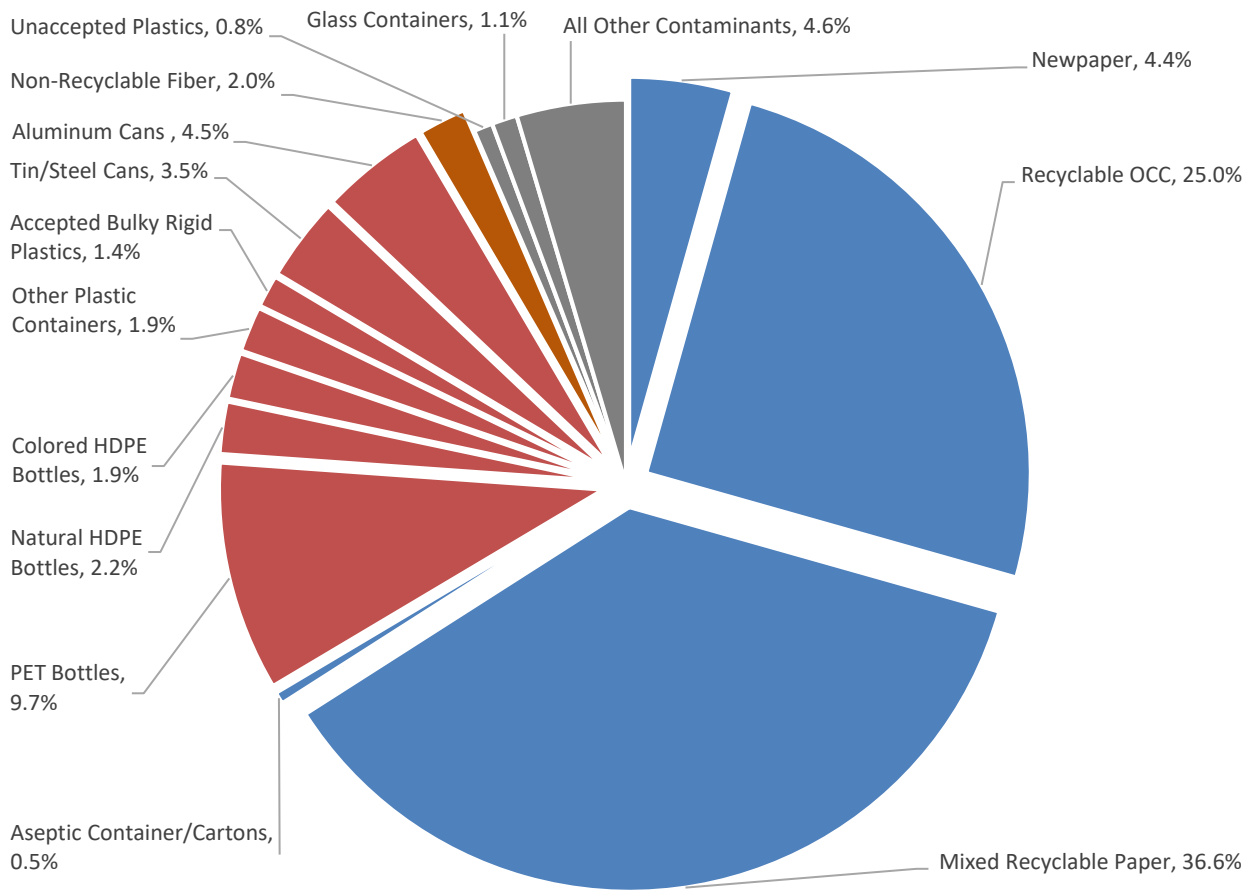
Key findings of the RCS include:

- Total accepted paper comprised about 67 percent of the recyclables. The majority of this was mixed recyclable paper (37 percent), followed by corrugated cardboard (25 percent). Newspaper comprised only about 4 percent of the recyclables.
- About 25 percent of the recyclables was accepted containers. Most of these were plastic containers, with PET bottles comprising the highest percentage (10 percent) followed by HDPE bottles at about 4 percent. Non-bottle plastics comprised about 3 percent of the stream. Metal containers comprised the remaining 8 percent.
- Total contaminants comprised about 8 percent of the recyclables. Overall the recyclables were exceptionally clean. Two exceptions were the Cole Park – Spare and Martha's Chapel – Spare samples which had several large hard cover books and a significant amount of wet fiber, respectively. The majority of samples had less than 6 percent total contaminants.
    - The largest individual material type in the contaminants was glass containers (1.1 percent), which are not accepted in the County's mixed recyclables stream.
    - Non-recyclable paper comprised 2 percent of the recyclables, which low grade paper (mostly paper towels, tissues, and contaminated paper) accounting for much of it. Wet fiber (corrugated cardboard and paper) comprised a combined 0.8 percent of the stream.
    - Unaccepted plastic materials comprised a combined 0.8 percent of the recyclables. This was mostly unaccepted bulky rigid plastics (primarily flowerpots) and film.
    - Approximately 3.5 percent of the recyclables were other contaminants. Some of the more common items in the category included non-recyclable plastics, spiral paper cans, and composite materials.
    - Full containers (primarily PET bottles) comprised only about 0.2 percent of the recyclables. A total of 4 small bags of recyclables were observed in all samples and comprised about 0.2 percent of the recyclables. This was mostly recyclable mixed paper.
    - A total of 6 "tanglers" were found in all samples. The most significant of which was an extension cord in the Bennett – Main container.

This RCS provides a current snapshot of the mixed recyclables that the County collects at its collection centers. The County can use this composition to calculate the average market value of its mixed recyclables using standard market indices. Additionally, the data can be used to target specific contaminants in its ongoing education and outreach efforts. Using the individual sample data in Appendix B, the County can focus on centers with higher contamination.

KCI appreciates the opportunity to once again work with the County and looks forward to assisting the County in future solid waste and recycling projects.

Figure 1: Composition of the Single Stream Recyclables (percent by weight)



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

- Recyclable OCC includes the categories of Corrugated Cardboard and Clean Pizza Boxes.
- Other Plastic Containers includes the categories of Non-Bottle PET Containers (#1), Other Narrow-Neck Bottles, Plastic Cups and Tubs, and Plastic Clamshells.
- Non-Recyclable Fiber includes the categories of Wet Corrugated Cardboard, Dirty Pizza Boxes, Wet Paper, Bagged Shredded Paper, and Film-Wrapped Paper.
- Unaccepted Plastics include the categories of Plastic Drink Cups, Plastic Bottles That Held Toxics, Unaccepted Bulky Rigid Plastics, Expanded Polystyrene Foam, and Non-Rigid Plastic Film.
- All Other Contaminants includes the categories of Ferrous Scrap Metals, Aluminum Foil and Trays, Non-Ferrous Scrap Metal, Small Appliances, Bagged Waste, Bagged Recyclables, Full Containers, Tanglers, Hazardous/Special Waste, Other Contaminants, and Grit.

Table 2: Composition of Single Stream Recyclables (percent by weight)

Material Category	Weighted Average	90% Confidence Interval	
		Lower Bounds	Upper Bounds
Newspaper	**4.4%**	2.4%	6.3%
Corrugated Cardboard	**24.9%**	21.6%	28.2%
Clean Pizza Boxes	**0.2%**	0.0%	0.3%
Mixed Recyclable Paper	**36.6%**	33.2%	40.0%
Aseptic Containers/ Cartons	**0.5%**	0.4%	0.6%
Accepted Paper	**66.5%**		
PET Bottles (#1)	**9.7%**	7.9%	11.4%
Natural HDPE Bottles (#2)	**2.2%**	1.8%	2.6%
Colored HDPE Bottles (#2)	**1.9%**	1.7%	2.2%
Non-Bottle PET Containers (#1)	**0.4%**	0.3%	0.5%
Other Narrow-Neck Bottles	**0.1%**	0.0%	0.3%
Plastic Cups and Tubs	**0.9%**	0.6%	1.1%
Plastic Clamshells	**0.5%**	0.4%	0.6%
Accepted Bulky Rigid Plastics	**1.4%**	1.0%	1.7%
Tin/Steel Cans	**3.5%**	2.7%	4.4%
Aluminum Cans	**4.5%**	3.7%	5.2%
Non-Hazardous Aerosol Cans	**0.0%**	0.0%	0.1%
Accepted Containers	**25.1%**		
Wet Corrugated Cardboard	**0.2%**	-0.2%	0.5%
Dirty Pizza Boxes	**0.3%**	0.2%	0.4%
Wet Paper	**0.6%**	0.0%	1.1%
Bagged Shredded Paper	**0.0%**	0.0%	0.0%
Film-Wrapped Paper	**0.2%**	0.1%	0.2%
Low Grade Paper	**0.8%**	0.7%	1.0%
Plastic Drink Cups	**0.1%**	0.1%	0.2%
Plastic Bottles That Held Toxics	**0.0%**	0.0%	0.1%
Unaccepted Bulky Rigid Plastics	**0.3%**	0.1%	0.4%
Expanded Polystyrene Foam	**0.1%**	0.1%	0.1%
Non-Rigid Plastic Film	**0.3%**	0.2%	0.3%
Ferrous Scrap Metals	**0.1%**	0.0%	0.2%
Aluminum Foil and Trays	**0.0%**	0.0%	0.0%
Non-Ferrous Scrap Metal	**0.1%**	0.0%	0.2%
Small Appliances	**0.0%**	0.0%	0.1%
Glass Containers	**1.1%**	0.7%	1.5%
Bagged Waste	**0.2%**	0.1%	0.2%
Bagged Recyclables	**0.2%**	0.1%	0.4%
Full Containers	**0.2%**	0.0%	0.3%
Tanglers	**0.0%**	-0.1%	0.2%
Hazardous/ Special Waste	**0.0%**	0.0%	0.1%
Other Contaminants	**3.5%**	2.5%	4.4%
Grit	**0.2%**	0.2%	0.3%
Total Contaminants	**8.4%**		

Note: Columns might not appear to add correctly due to rounding.

Appendix A: Material Categories Description

#	Material Categories	Accepted or Contamination	Description of Categories
1	**Newspaper**	Accepted	Newspaper (loose or tied) including other paper normally distributed inside newspaper such as ads, flyers, etc. *Does not include bagged newspaper.*
2	**Corrugated Cardboard**	Accepted	Uncoated brown "cardboard" boxes with a wavy core (no plastic liners or waxy coatings). *Does not include cardboard within shrink wrap plastic, such as from a case of bottled water.*
3	**Wet Corrugated Cardboard**	Contamination	Corrugated cardboard that is waterlogged or has lost structural integrity due to moisture. *Does not include damp cardboard.*
4	**Clean Pizza Boxes**	Accepted	Corrugated pizza boxes covered less than 50% by grease or food.
5	**Dirty Pizza Boxes**	Contamination	Corrugated pizza boxes covered 50% or more by grease or food.
6	**Mixed Recyclable Paper**	Accepted	Printed or unprinted recyclable paper including white, colored, coated and uncoated papers, envelopes, index cards, file folders, magazines, telephone books, catalogs, 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.*
7	**Wet Paper**	Contamination	Newspaper and mixed recyclable paper that is waterlogged or has lost structural integrity due to moisture. *Does not include damp paper.*
8	**Bagged Shredded Paper**	Contamination	Shredded paper in paper or plastic bags. Any loose shredded paper will be included in grit or low-grade paper.
9	**Film-Wrapped Paper**	Contamination	Newspaper or magazines inside plastics sleeves. OCC within shrink wrap plastic, such as that from a case of bottled water.
10	**Aseptic Containers/ Cartons**	Accepted	Gable-top cartons, aseptic juice boxes, and other similar containers made of coated paperboard.
11	**Low Grade Paper**	Contamination	All non-recyclable paper including, paper towels, napkins, tissue paper, paper cups, fast food wraps, other paper containers (e.g. ice cream tubs), shredded, contaminated, waxy, or metallic paper.
12	**PET Bottles (#1)**	Accepted	Clear and colored bottles and jars coded polyethylene terephthalate (PET #1). Examples include soda bottles, water bottles, food jars, etc. *Does not include loose caps and lids.*
13	**Natural HDPE Bottles (#2)**	Accepted	Clear/natural plastic bottles coded high-density polyethylene (HDPE #2). Examples include milk jugs, vinegar bottles, and gallon water bottles. *Does not include loose caps and lids.*
14	**Colored HDPE Bottles (#2)**	Accepted	Opaque, pigmented plastic bottles coded high-density polyethylene (HDPE #2). Examples include detergent and

#	Material Categories	Accepted or Contamination	Description of Categories
			shampoo bottles. *Does not include loose caps and lids.*
15	**Non-Bottle PET Containers (#1)**	Accepted	Clear and colored plastic non-bottle, non-jar containers coded PET #1. Examples include fruit or vegetable platters and some plastic drink cups.
16	**Other Narrow-Neck Bottles**	Accepted	All narrow-neck plastic containers coded #3-#7, such as vitamin bottles, Arizona Iced Tea™ gallon jugs, etc.
17	**Plastic Cups and Tubs**	Accepted	Wide-mouthed tubs and containers coded #2-7, including lids. Examples include coffee tubs, yogurt cups, margarine tubs, Cool Whip® tubs, and other non-bottle dairy items. *Does not include plastic drink cups.*
18	**Plastic Drink Cups**	Contamination	All plastic drink cups, regardless of plastic type.
19	**Plastic Clamshells**	Accepted	All plastic clamshell containers with a hinged lid, regardless of plastic type.
20	**Plastic Bottles That Held Toxics**	Contamination	Empty pesticide, oil, and other bottles that held toxic or hazardous chemicals. *Filled containers will be placed into hazardous/special waste.*
21	**Accepted Bulky Rigid Plastics**	Accepted	Non-container rigid plastic items accepted by Chatham County, such as plastic drums, crates, toys, buckets, baskets, laundry baskets, and other large plastic items. *Does not include electronic or electric toys, or bulky items consisting of mixed material.*
22	**Unaccepted Bulky Rigid Plastics**	Contamination	Non-container rigid plastic items not accepted by Chatham County, such as refuse totes, lawn furniture, and flowerpots.
23	**Expanded Polystyrene Foam**	Contamination	Container and non-container materials made of expanded polystyrene, which are typically white but may be pigmented. Examples include coolers, packaging materials, egg cartons, clam-shell containers, and disposable cups and plates.
24	**Non-Rigid Plastic Film**	Contamination	Loose and bagged plastic bags, clean garbage bags, shrink wrap, food wrap, re-sealable bags, plastic sheeting, etc.
25	**Tin/Steel Cans**	Accepted	Tin-plated steel cans, usually food containers, including labels. Includes steel caps and lids.
26	**Ferrous Scrap Metals**	Contamination	Non-container ferrous materials. Examples include sheet metal products, pipes, miscellaneous metal scraps, pots and pans, and other magnetic metal items.
27	**Aluminum Cans**	Accepted	Aluminum soft drink, beer, and food cans.
28	**Aluminum Foil and Trays**	Contamination	Aluminum foil and food trays, such as disposable pie plates and catering trays.
29	**Non-Hazardous Aerosol Cans**	Accepted	Empty aerosol cans, of aluminum or steel, that contained non-hazardous materials, such as whipped cream or shaving cream. Empty or full aerosol containers with hazardous materials, such as

#	Material Categories	Accepted or Contamination	Description of Categories
			spray paint, will be placed in *hazardous/special* waste.
30	**Non-Ferrous Scrap Metal**	Contamination	Non-container, non-foil, non-ferrous metals, such as aluminum cooking pans, copper wiring and tubing, and brass fixtures.
31	**Small Appliances**	Contamination	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.
32	**Glass Containers**	Contamination	All clear, green, blue, and amber glass bottles and jars as well as broken container glass pieces.
33	**Bagged Waste**	Contamination	Any bagged material with more than 20% of non-recyclables or heavily contaminated recyclables. *Does not include clean, bagged recyclables.*
34	**Bagged Recyclables**	Contamination	Any bagged material with 20% or less of non-recyclables. Bagged recyclables will be set aside, aggregated from all samples, then opened and sorted.
35	**Full Containers**	Contamination	Any containers filled by 25% or more of food or liquid. Full containers will be set aside, aggregated from all samples, then opened and sorted.
36	**Tanglers**	Contamination	Any materials that could potentially be tanglers during processing, such as hoses, extension cords, Christmas lights, clothing, wire hangers.
37	**Hazardous/ Special Waste**	Contamination	All hazardous or other waste that would require special disposal, including motor oil and oil filters, fluorescent lights, paints, solvents, pesticides, and medical wastes.
38	**Other Contaminants**	Contamination	Materials not included in the other categories, such as fast food lids and straws, plastics and mixed-material clothes hangers, loose plastic caps and lids, plastic cutlery and plates, CDs and VHS tapes, spiral paper cans (i.e. Pringles), composite materials, yard waste, diapers, interlocked/multi-material products that cannot be separated, electronics, and non-container glass.
39	**Grit**	Contamination	All material that falls through a ½ square inch mesh.

Appendix B: Individual RCS Sample Results (percent by weight)

	Hauler/Location	Pittsboro - Compactor	Harper's Crossroads - Main	Goldston - Main	Cole Park - Compactor	Asbury - Main	Hadley - Spare	Martha's Chapel - Spare
#	Material Categories sample #	1	2	3	4	5	6	7
1	Newspaper	6.5%	4.0%	5.1%	4.3%	5.5%	5.7%	2.7%
2	Corrugated Cardboard	41.5%	29.5%	12.6%	20.3%	14.3%	9.0%	25.8%
3	Wet Corrugated Cardboard	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
4	Clean Pizza Boxes	0.4%	0.4%	0.0%	0.0%	0.0%	0.0%	0.0%
5	Dirty Pizza Boxes	0.3%	0.7%	0.2%	0.6%	0.0%	0.0%	0.0%
6	Mixed Recyclable Paper	27.7%	26.2%	33.6%	46.2%	42.6%	58.1%	29.2%
7	Wet Paper	0.2%	0.0%	1.0%	0.0%	0.0%	0.0%	0.0%
8	Bagged Shredded Paper	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
9	Film-Wrapped Paper	0.7%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
10	Aseptic Containers/ Cartons	0.4%	0.4%	0.4%	0.4%	0.9%	1.3%	1.2%
11	Low Grade Paper	2.3%	0.2%	0.2%	0.5%	0.1%	0.3%	0.2%
12	PET Bottles (#1)	4.3%	18.7%	17.1%	7.4%	11.8%	7.9%	13.0%
13	Natural HDPE Bottles (#2)	1.9%	4.2%	4.6%	1.4%	2.4%	1.6%	3.5%
14	Colored HDPE Bottles (#2)	1.3%	3.5%	3.1%	1.5%	2.9%	1.3%	2.2%
15	Non-Bottle PET Containers (#1)	0.1%	1.0%	0.7%	0.3%	0.7%	0.4%	0.8%
16	Other Narrow-Neck Bottles	0.0%	1.4%	0.6%	0.0%	0.5%	0.7%	0.9%
17	Plastic Cups and Tubs	0.8%	0.4%	0.5%	0.6%	1.1%	0.9%	2.1%
18	Plastic Drink Cups	0.1%	0.1%	0.1%	0.1%	0.2%	0.1%	0.0%
19	Plastic Clamshells	0.5%	0.3%	0.4%	0.4%	1.3%	0.7%	1.0%
20	Plastic Bottles That Held Toxics	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%	0.0%
21	Accepted Bulky Rigid Plastics	0.0%	0.0%	1.3%	3.4%	0.0%	0.0%	3.4%
22	Unaccepted Bulky Rigid Plastics	1.1%	0.0%	2.1%	0.0%	0.0%	0.0%	0.0%
23	Expanded Polystyrene Foam	0.0%	0.0%	0.0%	0.2%	0.0%	0.0%	0.0%
24	Non-Rigid Plastic Film	0.1%	0.3%	0.1%	0.6%	0.1%	0.1%	0.2%
25	Tin/Steel Cans	1.4%	1.8%	3.1%	3.4%	5.2%	2.7%	2.7%
26	Ferrous Scrap Metals	0.0%	0.0%	0.0%	0.0%	0.0%	0.4%	0.0%
27	Aluminum Cans	2.2%	3.7%	7.5%	4.1%	6.0%	4.9%	8.0%
28	Aluminum Foil and Trays	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
29	Non-Hazardous Aerosol Cans	0.0%	0.0%	0.0%	0.0%	0.1%	0.0%	0.0%
30	Non-Ferrous Scrap Metal	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
31	Small Appliances	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
32	Glass Containers	2.2%	0.5%	2.6%	0.0%	1.7%	1.1%	0.2%
33	Bagged Waste	0.7%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
34	Bagged Recyclables	0.1%	0.0%	0.0%	0.0%	0.0%	0.2%	0.0%
35	Full Containers	0.1%	0.1%	0.0%	0.0%	0.0%	0.1%	0.0%
36	Tanglers	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
37	Hazardous/ Special Waste	0.0%	0.0%	0.0%	0.0%	0.1%	0.0%	0.0%
38	Other Contaminants	2.8%	2.5%	2.9%	4.1%	2.4%	2.3%	2.8%
39	Grit	0.2%	0.0%	0.2%	0.3%	0.2%	0.1%	0.2%
	TOTALS	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**	**100.0%**
	Annual Weight	277.70	24.27	30.95	403.83	34.69	30.39	49.04
	Source Fraction	0.21	0.02	0.02	0.31	0.03	0.02	0.04

Appendix B: Individual RCS Sample Results (percent by weight) (continued)

	Hauler/Location	Bennett - Main	Pittsboro - Spare	Harper's Crossroads- Spare	Siler city - Compactor	Bonlee - Compactor	Moncure - Main	Crutchfield - Main and spare mixed
#	Material Categories sample #	8	9	10	11	12	13	14
1	Newspaper	11.1%	7.5%	4.1%	1.1%	0.0%	4.3%	11.3%
2	Corrugated Cardboard	10.0%	13.3%	22.8%	15.9%	22.8%	44.2%	18.9%
3	Wet Corrugated Cardboard	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
4	Clean Pizza Boxes	0.3%	0.0%	0.0%	0.0%	0.4%	0.0%	0.0%
5	Dirty Pizza Boxes	0.0%	0.5%	0.3%	0.0%	0.5%	0.0%	0.0%
6	Mixed Recyclable Paper	18.3%	40.1%	35.9%	33.4%	37.4%	12.0%	36.0%
7	Wet Paper	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
8	Bagged Shredded Paper	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
9	Film-Wrapped Paper	0.0%	0.0%	0.0%	0.0%	0.1%	0.0%	0.0%
10	Aseptic Containers/ Cartons	0.4%	1.4%	0.5%	0.4%	0.1%	1.0%	0.8%
11	Low Grade Paper	0.2%	0.4%	0.1%	0.0%	0.4%	0.0%	0.4%
12	PET Bottles (#1)	24.0%	5.7%	15.7%	17.4%	16.2%	14.2%	15.5%
13	Natural HDPE Bottles (#2)	2.9%	2.0%	1.4%	3.8%	3.2%	1.5%	3.2%
14	Colored HDPE Bottles (#2)	3.9%	2.4%	2.3%	3.1%	2.0%	2.8%	2.9%
15	Non-Bottle PET Containers (#1)	0.0%	1.5%	0.0%	0.8%	0.7%	0.3%	0.2%
16	Other Narrow-Neck Bottles	0.5%	0.0%	0.3%	0.0%	0.0%	0.1%	0.0%
17	Plastic Cups and Tubs	1.5%	0.9%	0.6%	1.2%	1.5%	0.8%	1.3%
18	Plastic Drink Cups	0.2%	0.0%	0.0%	0.5%	0.0%	0.0%	0.3%
19	Plastic Clamshells	0.5%	0.5%	0.3%	0.4%	0.3%	0.3%	0.7%
20	Plastic Bottles That Held Toxics	0.3%	0.3%	0.0%	0.0%	0.2%	0.3%	0.0%
21	Accepted Bulky Rigid Plastics	0.0%	1.7%	0.2%	0.9%	0.0%	0.0%	0.1%
22	Unaccepted Bulky Rigid Plastics	0.0%	0.0%	0.0%	0.0%	0.0%	0.2%	0.4%
23	Expanded Polystyrene Foam	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%	0.0%
24	Non-Rigid Plastic Film	0.0%	0.5%	0.0%	0.1%	0.1%	0.2%	0.3%
25	Tin/Steel Cans	10.1%	4.4%	6.2%	6.8%	5.3%	4.0%	3.7%
26	Ferrous Scrap Metals	0.0%	0.0%	0.0%	0.0%	0.1%	0.0%	0.0%
27	Aluminum Cans	8.3%	8.0%	4.6%	6.2%	4.2%	5.5%	2.7%
28	Aluminum Foil and Trays	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
29	Non-Hazardous Aerosol Cans	0.3%	0.0%	0.0%	0.0%	0.2%	0.2%	0.0%
30	Non-Ferrous Scrap Metal	0.1%	0.0%	0.0%	0.0%	0.0%	1.7%	0.0%
31	Small Appliances	0.9%	0.0%	0.0%	0.1%	0.0%	0.5%	0.0%
32	Glass Containers	1.3%	4.3%	1.5%	0.8%	0.8%	2.0%	0.0%
33	Bagged Waste	0.0%	0.0%	0.0%	0.0%	0.4%	0.0%	0.0%
34	Bagged Recyclables	0.0%	0.0%	0.0%	2.0%	0.0%	0.0%	0.0%
35	Full Containers	0.0%	0.3%	1.5%	0.0%	1.3%	1.3%	0.3%
36	Tanglers	1.9%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
37	Hazardous/ Special Waste	0.0%	0.0%	0.0%	0.2%	0.0%	0.0%	0.2%
38	Other Contaminants	2.9%	3.1%	1.7%	4.8%	1.5%	2.4%	0.7%
39	Grit	0.1%	1.1%	0.2%	0.2%	0.2%	0.3%	0.0%
	TOTALS	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
	Annual Weight	18.20	7.56	2.20	110.25	53.64	31.37	20.11*
	Source Fraction	0.01	0.01	0.00	0.08	0.04	0.02	0.02

Appendix B: Individual RCS Sample Results (percent by weight) (continued)

	Hauler/Location	Crutchfield - Main and spare mixed	Siler City - Spare	Bennett - Spare	Moncure - Spare	Cole Park - Spare	Asbury - Spare	Hadley - Main
	Material Categories sample #	**15**	**16**	**17**	**18**	**19**	**20**	**21**
1	Newspaper	0.7%	2.2%	20.1%	21.4%	8.0%	0.7%	1.3%
2	Corrugated Cardboard	18.9%	25.0%	12.8%	17.2%	17.0%	18.2%	11.3%
3	Wet Corrugated Cardboard	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
4	Clean Pizza Boxes	0.6%	0.8%	0.3%	0.2%	0.1%	1.3%	0.6%
5	Dirty Pizza Boxes	0.0%	0.0%	0.4%	0.0%	0.0%	0.3%	0.0%
6	Mixed Recyclable Paper	25.4%	36.9%	29.5%	23.7%	34.2%	40.7%	49.6%
7	Wet Paper	0.0%	0.0%	0.0%	0.0%	3.7%	0.0%	0.3%
8	Bagged Shredded Paper	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
9	Film-Wrapped Paper	0.6%	0.0%	0.1%	0.0%	0.0%	0.0%	0.0%
10	Aseptic Containers/ Cartons	1.3%	0.0%	0.6%	0.3%	0.2%	0.5%	1.1%
11	Low Grade Paper	0.6%	0.7%	0.1%	0.1%	1.7%	0.1%	1.3%
12	PET Bottles (#1)	20.2%	11.0%	14.2%	9.6%	6.3%	13.2%	11.8%
13	Natural HDPE Bottles (#2)	4.6%	2.5%	3.8%	2.6%	0.9%	3.1%	2.5%
14	Colored HDPE Bottles (#2)	2.6%	2.0%	3.7%	2.7%	2.2%	2.7%	3.2%
15	Non-Bottle PET Containers (#1)	0.5%	0.2%	0.2%	0.1%	0.3%	0.6%	0.7%
16	Other Narrow-Neck Bottles	0.0%	0.5%	0.0%	0.5%	0.1%	0.3%	0.5%
17	Plastic Cups and Tubs	3.4%	0.5%	1.4%	1.4%	0.7%	1.0%	0.0%
18	Plastic Drink Cups	0.1%	0.2%	0.1%	0.1%	0.2%	0.2%	0.3%
19	Plastic Clamshells	0.4%	1.0%	0.3%	0.6%	1.0%	0.9%	0.9%
20	Plastic Bottles That Held Toxics	0.0%	0.2%	0.0%	0.4%	0.0%	0.1%	0.0%
21	Accepted Bulky Rigid Plastics	0.0%	1.2%	0.3%	0.0%	0.0%	0.3%	0.9%
22	Unaccepted Bulky Rigid Plastics	0.0%	0.0%	0.1%	0.2%	0.0%	0.0%	0.0%
23	Expanded Polystyrene Foam	0.0%	0.0%	0.0%	0.1%	0.0%	0.0%	0.1%
24	Non-Rigid Plastic Film	0.2%	0.0%	0.0%	0.1%	0.3%	0.2%	0.3%
25	Tin/Steel Cans	10.1%	3.8%	4.8%	6.5%	1.5%	5.5%	4.7%
26	Ferrous Scrap Metals	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
27	Aluminum Cans	6.0%	5.4%	4.0%	5.5%	4.2%	6.1%	5.9%
28	Aluminum Foil and Trays	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%
29	Non-Hazardous Aerosol Cans	0.6%	0.0%	0.0%	0.3%	0.2%	0.1%	0.0%
30	Non-Ferrous Scrap Metal	0.0%	0.0%	0.0%	0.3%	0.0%	0.0%	0.0%
31	Small Appliances	0.0%	0.0%	0.0%	0.0%	0.0%	0.1%	0.0%
32	Glass Containers	0.0%	3.1%	1.4%	3.3%	0.0%	1.1%	0.5%
33	Bagged Waste	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
34	Bagged Recyclables	0.0%	0.0%	0.0%	0.0%	1.3%	0.0%	0.0%
35	Full Containers	0.0%	0.0%	0.4%	1.2%	0.0%	0.7%	0.3%
36	Tanglers	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
37	Hazardous/ Special Waste	0.7%	0.0%	0.1%	0.0%	0.0%	0.0%	0.2%
38	Other Contaminants	2.4%	2.9%	1.2%	1.2%	15.7%	2.1%	1.5%
39	Grit	0.1%	0.0%	0.2%	0.1%	0.1%	0.2%	0.2%
	TOTALS	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
	Annual Weight	20.11*	6.12	0.81	10.38	40.24	4.97	45.74
	Source Fraction	0.02	0.00	0.00	0.01	0.03	0.00	0.03

Appendix B: Individual RCS Sample Results (percent by weight) (continued)

	Hauler/Location	Bonlee - Spare	Main Facility	Goldston - Spare	Martha's Chapel - Main
	Material Categories sample #	**22**	**23**	**24**	**25**
1	Newspaper	1.2%	0.1%	1.9%	0.0%
2	Corrugated Cardboard	24.3%	38.4%	10.6%	29.3%
3	Wet Corrugated Cardboard	5.0%	1.8%	0.0%	2.7%
4	Clean Pizza Boxes	1.4%	0.0%	0.0%	0.0%
5	Dirty Pizza Boxes	0.6%	0.0%	0.0%	0.0%
6	Mixed Recyclable Paper	25.2%	38.7%	40.5%	30.0%
7	Wet Paper	0.0%	1.8%	0.0%	7.2%
8	Bagged Shredded Paper	0.0%	0.0%	0.0%	0.0%
9	Film-Wrapped Paper	0.0%	0.0%	0.0%	0.0%
10	Aseptic Containers/ Cartons	0.6%	0.3%	0.3%	0.5%
11	Low Grade Paper	0.4%	0.9%	0.1%	0.3%
12	PET Bottles (#1)	17.1%	6.7%	17.1%	7.5%
13	Natural HDPE Bottles (#2)	3.3%	1.5%	4.4%	2.1%
14	Colored HDPE Bottles (#2)	1.1%	1.1%	3.0%	1.5%
15	Non-Bottle PET Containers (#1)	0.0%	0.3%	0.2%	0.3%
16	Other Narrow-Neck Bottles	0.2%	0.1%	0.2%	0.0%
17	Plastic Cups and Tubs	0.7%	0.6%	0.3%	0.4%
18	Plastic Drink Cups	0.2%	0.3%	0.1%	0.2%
19	Plastic Clamshells	0.2%	0.0%	0.2%	0.7%
20	Plastic Bottles That Held Toxics	0.0%	0.0%	0.1%	0.0%
21	Accepted Bulky Rigid Plastics	0.0%	1.5%	0.0%	0.3%
22	Unaccepted Bulky Rigid Plastics	0.0%	0.0%	0.0%	0.0%
23	Expanded Polystyrene Foam	0.0%	0.0%	0.0%	0.0%
24	Non-Rigid Plastic Film	0.3%	0.3%	0.0%	0.1%
25	Tin/Steel Cans	8.8%	1.2%	3.1%	3.3%
26	Ferrous Scrap Metals	0.0%	0.0%	0.0%	1.6%
27	Aluminum Cans	5.2%	2.3%	12.6%	5.8%
28	Aluminum Foil and Trays	0.0%	0.0%	0.0%	0.0%
29	Non-Hazardous Aerosol Cans	0.3%	0.0%	0.6%	0.0%
30	Non-Ferrous Scrap Metal	0.0%	0.0%	0.0%	1.0%
31	Small Appliances	0.0%	0.0%	0.0%	0.0%
32	Glass Containers	1.0%	1.2%	2.4%	3.6%
33	Bagged Waste	0.0%	0.0%	0.0%	0.0%
34	Bagged Recyclables	0.0%	0.0%	0.0%	0.0%
35	Full Containers	1.0%	0.0%	1.3%	0.0%
36	Tanglers	0.0%	0.0%	0.0%	0.1%
37	Hazardous/ Special Waste	0.0%	0.0%	0.0%	0.0%
38	Other Contaminants	2.1%	0.9%	1.0%	1.4%
39	Grit	0.1%	0.1%	0.0%	0.1%
	TOTALS	100.0%	100.0%	100.0%	100.0%
	Annual Weight	1.29	20.70	6.12	61.26
	Source Fraction	0.00	0.02	0.00	0.05