SUNSHINE CANYON LANDFILL
SUPPPEMENTAL WASTE CHARACTERIZATION STUDY

PREPARED FOR

SUNSHINE CANYON LANDFILL – COMMUNITY ADVISORY COMMITTEE

AND

PATRIOT OIL COMMUNITY BENEFIT TRUST FUND

PREPARED BY

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AND

ECOTELESIS INTERNATIONAL

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1. INTRODUCTION

Tetra Tech, Inc. was contracted by Sunshine Canyon Landfill Community Advisory Committee (SCL-CAC) and Patriot Oil Community Benefit Trust Fund (POCBTF) to conduct a supplemental waste characterization study of waste destined for the Sunshine Canyon Landfill located in Sylmar, California.

The purposes of this additional waste characterization study are four-fold: (1) to supplement the required biannual material type waste characterization studies to obtain information that can be used to develop measures to mitigate landfill odors, and to update landfill gas models; (2) to provide critical information on chemical and physical properties of selected waste streams to enhance the design and efficiency of the overall landfill gas collection system; (3) to provide information for improved waste diversion programs; and (4) to provide information on the waste composition during a "wet season" when the odor complaint is high.

The actual waste sorting and screening was conducted at the City of Los Angeles' Central Los Angeles Recycling and Transfer Station located at 2201 E Washington Blvd. Los Angeles, CA 90021. The transfer station provided a covered work space and all of the waste samples for this study. The waste sample sorting and screening activities commenced on February 23, 2015 and concluded on February 27, 2015. Please note that this is a limited study and that the resulting data is only a "snapshot in time". Multiple studies throughout the year would be needed for a more complete characterization of the waste.

Representative waste samples were collected and shipped to laboratories for the following analyses: (1) samples from four waste sources – residential, commercial/industrial, self-haul, and roll-off/compactor were tested for biological methane potential (BMP) analysis; and, (2) samples from 21[1] sorted materials types were tested for ultimate analysis, approximate analysis, and heating value (BTU).

This supplemental waste characterization study report includes the following sections:

A. Introduction – provides brief background of the study and the report organization
B. Waste Characterization Procedures – describes waste characterization procedures used in the study including waste type sorting and size screening
C. Waste Sample Collection, Preparation and Laboratory Analysis – describes sample collection, packaging, preparation, and types of laboratory analysis performed on the collected samples
D. Results – provides a summary of material type sorting and sizing results and the results provided by the contracted laboratories

[1] The original sampling plan was to collect 22 material types of waste sample, however, because there was an insufficient amount of "treated wood" in the incoming waste stream, only 21 materials types were collected for analysis.

2. WASTE CHARACTERIZATION PROCEDURES

The procedures used in this supplemental waste characterization includes three parts: (1) material type classification, (2) physical characteristics (size screening), (3) and chemical properties analyses. The project team consisting of Tetra Tech and Ecotelesis followed the protocols developed by the Sunshine Canyon Landfill Local Enforcement Agency to conduct material type classification, physical characteristics, and chemical property analyses. Details of the waste characterization protocols can be found in Appendix A and are described in the rest of this section.

2.1 Waste Sort by Material Type Sampling Procedures

- Pull selected loads from incoming hauling trucks carrying waste from various sources – residential, commercial/industrial, self-haul, and roll-off/compactor
- Use a front loader to take a section from the middle of the selected load that is approximately 250 pounds (lbs), avoid taking sample from the bottom
- Cone and quarter the sample into four equal parts
- Select a quarter of the entire sample and place into a bucket for the BMP analysis
- Sort the remaining material into the 47 material types[2]
- Weigh and record the amount of sample collected for each material type
- Collect 21 of the 47 material types from each source and place in buckets for the Proximate, Ultimate, and Heating Value analyses

FIGURE 1 LOAD SELECTED FOR SAMPLING FROM QUEUE OF GARBAGE TRUCKS

FIGURE 2 EQUIPMENT SETUP

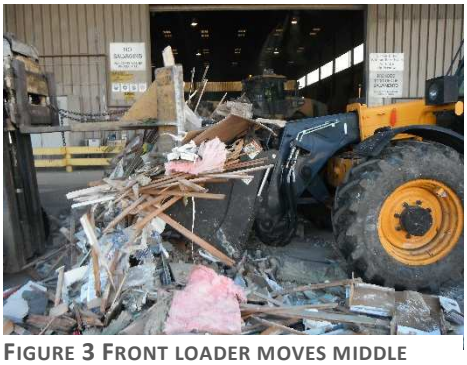


FIGURE 3 FRONT LOADER MOVES MIDDLE SECTION OF THE LOAD FOR SAMPLING

FIGURE 4 SAMPLE IS CONED AND QUARTERED

[2] Please refer to Appendix B – Waste Classifications/Material Types

2.2 Waste Sort by Physical Characteristics/Size Screening Procedure

- The remaining material is readied for size screening analysis
- Material from each material type are placed on screens starting with a 20" screen
- Material that falls through the screen, "unders", are collected to be sieved through the next screen, 16"
- The process is repeated with the "unders" while gradually decreasing the size of the screens (20", 16", 12", 9", 6", 4", and 2")
- Material that remain on the top of the screen are described as "overs"
- "Overs" are weighed and recorded

FIGURE 5 MATERIAL TYPE: "OTHER PLASTIC BOTTLES/CONTAINERS" SIEVED THROUGH SIZING SCREEN

FIGURE 6 MATERIAL THAT FALLS THROUGH THE SCREEN, "UNDERS", ARE PLACED INTO A CONTAINER TO BE USED IN THE NEXT SCREEN

3. WASTE SAMPLE COLLECTION, PREPARATION AND LABORATORY ANALYSIS

This study analyzed all four waste streams for its chemical and physical properties to develop odor mitigation measures. Laboratory analyses include: Biological Methane Potential, Proximate, Ultimate, and Heating Value (BTU). Biological Methane Potential analyses were performed by Woods End Laboratories (Woods End), Proximate, Ultimate, and Heating Value analyses were performed by ALS Environmental (ALS).

The project team followed the laboratories' sample handling and shipping requirements to safely collect, package and transport the samples. All samples were collected in 10-gallon plastic trash bags that were sealed and stored in plastic buckets with screw-top lids. Each bucket was secured, labeled on the tops and sides, and placed in insulated polystyrene coolers. Ice packs were placed around the buckets to slow down the rate of any possible biological activity in the samples. The cooler lid was then secured with tape and placed in a cardboard shipping container. The laboratories' Chain of Custody forms were prepared the day before and included in each shipping container. In order to streamline the process, the project team scheduled Fed-Ex to pick-up the samples at the waste sort location and printed Fed-Ex shipping labels the day before. All samples were time sensitive and shipped overnight to their respective laboratories.

FIGURE 7 SAMPLE COLLECTED IN 5-GALLON BUCKET AND PLACED IN AN INSULATED COOLER FOR LABORATORY

To measure the Biological Methane Potential of each waste stream, two samples from each source (residential, commercial/industrial, roll-off/compactor, and self-haul) were sent to Woods End. Upon receiving all eight samples, Woods End prepared the samples for the analysis which required the laboratory to chop and grind the material into a size suitable for their testing equipment. The laboratory then utilized the Standardized Biogas GB21 (ÖNORM S 2027-3) test to measure the potential amount of biogas produced by each sample after a 21 day period.

One sample per material type from all sources were overnighted to ALS. The Scope of Work originally planned to test 22 samples, however only 21 samples were collected. An insufficient amount of materials/samples were collected for the "Treated Wood" material type. Upon receiving the samples, the laboratory also chopped and ground the samples in preparation for the analyses. ALS adhered to the American Society for Testing Materials' (ASTM) standards when conducting the Ultimate, Proximate, and Heating Value analyses. The Ultimate analysis (ASTM D5373 and D4239) tested the samples for: Carbon, Hydrogen, Nitrogen, Oxygen, and Sulfur. The Proximate analysis (ASTM D7582) tested the samples for: moisture, volatile matter, fixed carbon, and ash. The Heating Value (ASTM D5865) tested each sample for their energy value. ALS prepared each sample by air drying and grinding into a size suitable for the testing equipment.

4. RESULTS

This section summarizes the findings by project team member, EcoTelesis International, in regards to the Material Type Weight and Size Screening observed during the waste sort and the laboratory results of the Biological Methane Potential, Proximate, Ultimate and Heating Value analyses from Woods End Laboratories and ALS Environmental.

4.1 Material Type Weight

For each source, project team member Ecotelesis International sorted the sample into 47 different material types, then weighed and recorded the amount collected for each material type. The weight percentage of each material type is calculated by taking the weight of the material type divided by the total weight from the waste source. Throughout this section we reference the weight percentage to identify which material type is the majority of each source.

For summarizing purposes the different material types were categorized into 12 major material types. For example, Newspaper, Office paper, Compostable paper and other similar material types were categorized as Paper.

On the following pages, Table 1 is a summary of the weight results from each source for each major material types. The subsequent figure, Figure 8, represents the weight results of each major material type from each waste source. As shown in Figure 8, the largest source of the Organic material type is from the Residential source.

TABLE 1 WEIGHT RESULTS BY MATERIAL TYPE (PER WASTE SOURCE)

WASTE CHARACTERIZATION / BY SECTOR
CENTRAL LA RECYCLING AND TRANSFER STATION
2014 ANNUAL TONS MARCH 2015
ECOTELESIS INTERNATIONAL

Note: Only these four Sectors in scope of study.

		TOTAL-ALL SECTORS				RESIDENTIAL				COMMERCIAL/INDUSTRIAL				ROLL-OFF/COMPACTOR				SELF-HAUL			
			# Samples		20		# Samples		4		# Samples		5		# Samples		6		# Samples		5
		PCT	90% CONF. INT.		TONS	PCT	90% CONF. INT.		TONS	PCT	90% CONF. INT.		TONS	PCT	90% CONF. INT.		TONS	PCT	90% CONF. INT.		TONS
TOTAL SAMPLE		**100.0%**			**743,604**	**100.0%**			**544,650**	**100.0%**			**76,912**	**100.0%**			**100,720**	**100.0%**			**21,322**
PAPER		**19.5%**	**17.3%**	**21.8%**	**145,343**	**16.9%**	**14.4%**	**19.3%**	**91,808**	**25.7%**	**19.4%**	**32.0%**	**19,758**	**33.4%**	**18.7%**	**48.0%**	**33,591**	**0.9%**	**0.0%**	**1.9%**	**185**
1	OCC (Recyclable)/Kraft	3.2%	2.4%	3.9%	23,669	2.1%	1.1%	3.2%	11,591	7.4%	4.9%	9.8%	5,669	6.2%	2.5%	9.9%	6,267	0.7%	0.0%	1.5%	143
2	Newspaper	1.3%	0.7%	1.8%	9,451	1.0%	0.4%	1.7%	5,623	1.5%	0.0%	3.5%	1,135	2.7%	0.0%	6.2%	2,692	0.0%	0.0%	0.0%	0
3	Office Paper	1.2%	0.6%	1.8%	8,745	0.8%	0.3%	1.3%	4,303	1.9%	0.0%	4.2%	1,447	3.0%	0.0%	7.1%	2,993	0.0%	0.0%	0.0%	2
4	Mixed Recyclable Paper (Magazines, Chipboard Boxes, etc.)	3.0%	2.2%	3.8%	22,219	3.1%	1.8%	4.4%	16,812	3.1%	0.8%	5.4%	2,391	3.0%	0.9%	5.1%	2,993	0.1%	0.0%	0.3%	23
5	Compostable Paper (Napkins, Paper Towels, Tissues)	6.4%	5.2%	7.6%	47,446	6.6%	5.2%	8.0%	36,035	4.2%	2.2%	6.2%	3,228	8.1%	0.6%	15.7%	8,177	0.0%	0.0%	0.1%	6
6	R/C Non-Recyclable Paper (Coated OCC, Laminated Paper, etc.)	4.5%	3.4%	5.7%	33,814	3.2%	1.3%	5.1%	17,443	7.7%	4.1%	11.2%	5,888	10.4%	7.0%	13.8%	10,469	0.1%	0.0%	0.1%	12
PLASTIC		**13.5%**	**10.6%**	**16.4%**	**100,530**	**10.5%**	**8.6%**	**12.4%**	**57,036**	**17.0%**	**9.2%**	**24.8%**	**13,068**	**30.1%**	**7.6%**	**52.6%**	**30,290**	**0.6%**	**0.0%**	**1.6%**	**137**
7	#1 PET Bottles/Containers	0.5%	0.2%	0.7%	3,602	0.5%	0.1%	1.0%	2,754	0.5%	0.1%	0.8%	355	0.5%	0.0%	1.0%	491	0.0%	0.0%	0.0%	2
8	#2 HDPE Bottles/Containers	0.4%	0.2%	0.5%	2,617	0.3%	0.1%	0.6%	1,664	0.7%	0.3%	1.1%	525	0.4%	0.0%	0.8%	428	0.0%	0.0%	0.0%	0
9	Other Plastic Bottles/Containers	0.6%	0.4%	0.7%	4,114	0.5%	0.3%	0.7%	2,869	1.1%	0.7%	1.4%	830	0.4%	0.0%	0.8%	400	0.1%	0.0%	0.2%	15
10	Plastic Film/Wrap	5.6%	3.4%	7.8%	41,585	3.9%	3.4%	4.4%	21,058	7.4%	0.7%	14.1%	5,676	14.7%	0.0%	32.7%	14,845	0.0%	0.0%	0.1%	6
11	Plastic Products (Durable Goods)	0.8%	0.6%	1.1%	6,249	0.7%	0.4%	1.0%	3,844	2.3%	0.3%	4.3%	1,774	0.5%	0.0%	1.1%	546	0.4%	0.0%	1.2%	85
12	R/C Plastic	**5.7%**	**3.2%**	**8.2%**	**42,364**	**4.6%**	**3.3%**	**5.9%**	**24,845**	**5.1%**	**2.2%**	**7.9%**	**3,909**	**13.5%**	**0.0%**	**33.7%**	**13,580**	**0.1%**	**0.0%**	**0.3%**	**29**
METAL		**3.1%**	**2.0%**	**4.3%**	**23,269**	**3.2%**	**1.2%**	**5.2%**	**17,501**	**2.7%**	**1.9%**	**3.4%**	**2,057**	**3.3%**	**0.2%**	**6.4%**	**3,293**	**2.0%**	**0.8%**	**3.2%**	**418**
13	Aluminum Cans	0.1%	0.1%	0.2%	1,039	0.1%	0.0%	0.3%	803	0.1%	0.0%	0.2%	106	0.1%	0.0%	0.3%	127	0.0%	0.0%	0.0%	2
14	Tin/Steel Cans	1.1%	0.4%	1.9%	8,526	1.2%	0.0%	2.5%	6,369	1.0%	0.4%	1.7%	787	1.4%	0.0%	3.1%	1,364	0.0%	0.0%	0.1%	5
15	Other Ferrous Metals	0.9%	0.0%	1.8%	6,684	1.1%	0.0%	2.7%	5,795	0.6%	0.0%	1.4%	426	0.2%	0.0%	0.5%	218	1.1%	0.1%	2.2%	244
16	Other Non-Ferrous Metals	0.6%	0.4%	0.8%	4,210	0.6%	0.3%	0.9%	3,385	0.5%	0.0%	0.9%	362	0.5%	0.0%	0.9%	455	0.0%	0.0%	0.1%	8
17	R/C Mixed Metals/Other Materials	0.4%	0.1%	0.7%	2,811	0.2%	0.0%	0.4%	1,148	0.5%	0.0%	1.1%	376	1.1%	0.0%	3.3%	1,128	0.7%	0.0%	1.9%	159
GLASS		**2.8%**	**1.2%**	**4.4%**	**20,595**	**3.3%**	**0.4%**	**6.2%**	**18,189**	**1.4%**	**0.3%**	**2.5%**	**1,071**	**1.3%**	**0.0%**	**2.6%**	**1,328**	**0.0%**	**0.0%**	**0.1%**	**6**
18	Glass Bottles (Recyclable)	2.2%	1.0%	3.3%	16,305	2.6%	0.5%	4.7%	14,115	1.2%	0.3%	2.2%	944	1.2%	0.0%	2.5%	1,246	0.0%	0.0%	0.0%	0
19	Other Glass (Non-Recyclable)	0.1%	0.0%	0.3%	1,053	0.2%	0.0%	0.5%	1,033	0.0%	0.0%	0.0%	14	0.0%	0.0%	0.0%	0	0.0%	0.0%	0.1%	6
20	R/C Glass and Other Materials	0.4%	0.0%	1.0%	3,237	0.6%	0.0%	1.5%	3,041	0.1%	0.0%	0.3%	114	0.1%	0.0%	0.2%	82	0.0%	0.0%	0.0%	0
INORGANICS		**4.8%**	**2.6%**	**7.1%**	**35,943**	**2.6%**	**0.0%**	**6.7%**	**14,230**	**2.8%**	**0.0%**	**6.5%**	**2,143**	**0.4%**	**0.0%**	**0.9%**	**355**	**90.1%**	**80.4%**	**99.8%**	**19,216**
21	C&D (Bricks, Tiles, etc.)	3.0%	0.6%	5.4%	22,316	2.0%	0.0%	6.2%	11,074	0.0%	0.0%	0.1%	35	0.0%	0.0%	0.1%	45	52.3%	12.4%	92.3%	11,161
22	Ceramics	0.5%	0.0%	1.3%	3,569	0.0%	0.0%	0.1%	115	0.0%	0.0%	0.0%	0	0.0%	0.0%	0.0%	0	16.2%	0.0%	52.0%	3,454
23	Sand/Rocks/Dirt	0.1%	0.0%	0.2%	475	0.0%	0.0%	0.0%	0	0.0%	0.0%	0.0%	0	0.0%	0.0%	0.0%	0	2.2%	0.0%	6.6%	475
24	R/C and Other Inorganics	1.3%	0.5%	2.0%	9,583	0.6%	0.0%	1.2%	3,041	2.7%	0.0%	6.4%	2,107	0.3%	0.0%	0.8%	309	19.3%	0.0%	44.6%	4,125
GREEN WASTE		**2.4%**	**0.0%**	**5.1%**	**17,929**	**3.2%**	**0.0%**	**8.1%**	**17,443**	**0.2%**	**0.0%**	**0.4%**	**156**	**0.3%**	**0.0%**	**0.8%**	**327**	**0.0%**	**0.0%**	**0.0%**	**2**
25	Green/Yard Waste (Leaves/Grass)	1.0%	0.0%	1.9%	7,185	1.2%	0.0%	3.0%	6,771	0.1%	0.0%	0.3%	114	0.3%	0.0%	0.7%	300	0.0%	0.0%	0.0%	0
26	Branches/Twigs	1.4%	0.0%	3.3%	10,744	2.0%	0.0%	5.3%	10,673	0.1%	0.0%	0.1%	43	0.0%	0.0%	0.1%	27	0.0%	0.0%	0.0%	2
27	Stumps (> 4" Diameter)	0.0%	0.0%	0.0%	0	0.0%	0.0%	0.0%	0	0.0%	0.0%	0.0%	0	0.0%	0.0%	0.0%	0	0.0%	0.0%	0.0%	0
WOOD		**0.8%**	**0.5%**	**1.2%**	**6,097**	**0.5%**	**0.2%**	**0.7%**	**2,467**	**1.3%**	**0.0%**	**3.3%**	**1,036**	**1.4%**	**0.0%**	**3.0%**	**1,383**	**5.7%**	**0.0%**	**14.2%**	**1,212**
28	Untreated/Clean Wood	0.6%	0.3%	0.9%	4,359	0.4%	0.1%	0.6%	2,066	1.3%	0.0%	3.3%	1,036	0.0%	0.0%	0.1%	45	5.7%	0.0%	14.2%	1,212
29	Treated Wood	0.0%	0.0%	0.0%	0	0.0%	0.0%	0.0%	0	0.0%	0.0%	0.0%	0	0.0%	0.0%	0.0%	0	0.0%	0.0%	0.0%	0
30	Pallets	0.2%	0.0%	0.5%	1,739	0.1%	0.0%	0.2%	402	0.0%	0.0%	0.0%	0	1.3%	0.0%	3.0%	1,337	0.0%	0.0%	0.0%	0
ORGANICS		**47.9%**	**41.5%**	**54.3%**	**356,304**	**53.5%**	**42.7%**	**64.4%**	**291,547**	**46.7%**	**35.9%**	**57.4%**	**35,906**	**28.6%**	**8.5%**	**48.8%**	**28,825**	**0.1%**	**0.0%**	**0.2%**	**26**
31	Food	22.5%	15.4%	29.6%	167,321	22.5%	10.4%	34.7%	122,793	23.0%	13.8%	32.3%	17,722	26.6%	5.5%	47.7%	26,797	0.0%	0.0%	0.1%	9
32	Textiles/Leather	9.2%	0.0%	19.1%	68,559	9.9%	0.0%	27.8%	54,052	18.3%	0.0%	39.7%	14,090	0.4%	0.1%	0.7%	400	0.1%	0.0%	0.2%	17
33	Rubber	0.1%	0.1%	0.2%	896	0.1%	0.0%	0.1%	344	0.3%	0.1%	0.4%	206	0.3%	0.1%	0.6%	346	0.0%	0.0%	0.0%	0
34	Carpet/Padding	0.2%	0.0%	0.5%	1,490	0.0%	0.0%	0.0%	57	1.9%	0.0%	4.8%	1,433	0.0%	0.0%	0.0%	0	0.0%	0.0%	0.0%	0
35	R/C Miscellaneous Organics	15.9%	8.0%	23.7%	118,038	21.0%	6.5%	35.5%	114,301	3.2%	0.8%	5.6%	2,455	1.3%	0.0%	3.4%	1,283	0.0%	0.0%	0.0%	0
HHW/SPECIAL WASTE		**1.5%**	**0.4%**	**2.6%**	**11,070**	**2.0%**	**0.0%**	**4.1%**	**10,787**	**0.1%**	**0.0%**	**0.3%**	**99**	**0.1%**	**0.0%**	**0.2%**	**91**	**0.4%**	**0.0%**	**1.2%**	**93**
36	Pesticides/Herbicides	0.0%	0.0%	0.0%	0	0.0%	0.0%	0.0%	0	0.0%	0.0%	0.0%	0	0.0%	0.0%	0.0%	0	0.0%	0.0%	0.0%	0
37	Paints/Adhesives/Solids	0.5%	0.0%	1.3%	3,672	0.7%	0.0%	2.2%	3,672	0.0%	0.0%	0.0%	0	0.0%	0.0%	0.0%	0	0.0%	0.0%	0.0%	0
38	Household Cleaners	0.0%	0.0%	0.0%	0	0.0%	0.0%	0.0%	0	0.0%	0.0%	0.0%	0	0.0%	0.0%	0.0%	0	0.0%	0.0%	0.0%	0
39	Automotive Fluids and Other (Wax, Polish, etc.)	0.8%	0.0%	2.0%	5,738	1.1%	0.0%	3.4%	5,738	0.0%	0.0%	0.0%	0	0.0%	0.0%	0.0%	0	0.0%	0.0%	0.0%	0
40	E-Waste (Electronics, Computers, CRT, etc.)	0.1%	0.0%	0.3%	766	0.1%	0.0%	0.4%	689	0.1%	0.0%	0.2%	64	0.0%	0.0%	0.0%	9	0.0%	0.0%	0.1%	5
41	Other HHW/Special Waste	0.1%	0.0%	0.2%	894	0.1%	0.0%	0.3%	689	0.0%	0.0%	0.1%	35	0.1%	0.0%	0.2%	82	0.4%	0.0%	1.2%	88
BULKY ITEMS		**0.1%**	**0.0%**	**0.3%**	**1,029**	**0.0%**	**0.0%**	**0.0%**	**0**	**1.3%**	**0.0%**	**3.3%**	**1,029**	**0.0%**	**0.0%**	**0.0%**	**0**	**0.0%**	**0.0%**	**0.0%**	**0**
42	Household Appliances	0.1%	0.0%	0.3%	745	0.0%	0.0%	0.0%	0	1.0%	0.0%	2.9%	745	0.0%	0.0%	0.0%	0	0.0%	0.0%	0.0%	0
43	Furniture/Mattresses	0.0%	0.0%	0.0%	114	0.0%	0.0%	0.0%	0	0.1%	0.0%	0.5%	114	0.0%	0.0%	0.0%	0	0.0%	0.0%	0.0%	0
44	Other Bulky Materials	0.0%	0.0%	0.1%	170	0.0%	0.0%	0.0%	0	0.2%	0.0%	0.7%	170	0.0%	0.0%	0.0%	0	0.0%	0.0%	0.0%	0
MIXED RESIDUE		**3.4%**	**0.0%**	**7.1%**	**25,495**	**4.3%**	**0.0%**	**11.1%**	**23,641**	**0.8%**	**0.1%**	**1.4%**	**589**	**1.2%**	**0.0%**	**2.7%**	**1,237**	**0.1%**	**0.0%**	**0.3%**	**29**
45	Mixed Residue	3.4%	0.0%	7.1%	25,495	4.3%	0.0%	11.1%	23,641	0.8%	0.1%	1.4%	589	1.2%	0.0%	2.7%	1,237	0.1%	0.0%	0.3%	29
PROBLEM MATERIALS (NON-PROCESSIBLE MATERIALS)		**0.0%**	**0.0%**	**0.0%**	**0**	**0.0%**	**0.0%**	**0.0%**	**0**	**0.0%**	**0.0%**	**0.0%**	**0**	**0.0%**	**0.0%**	**0.0%**	**0**	**0.0%**	**0.0%**	**0.0%**	**0**
46	Provide Description (e. g. Hose, Ropes, etc.)	0.0%	0.0%	0.0%	0	0.0%	0.0%	0.0%	0	0.0%	0.0%	0.0%	0	0.0%	0.0%	0.0%	0	0.0%	0.0%	0.0%	0

FIGURE 8 WEIGHT RESULTS BY MAJOR MATERIAL TYPE AND WASTE SOURCES

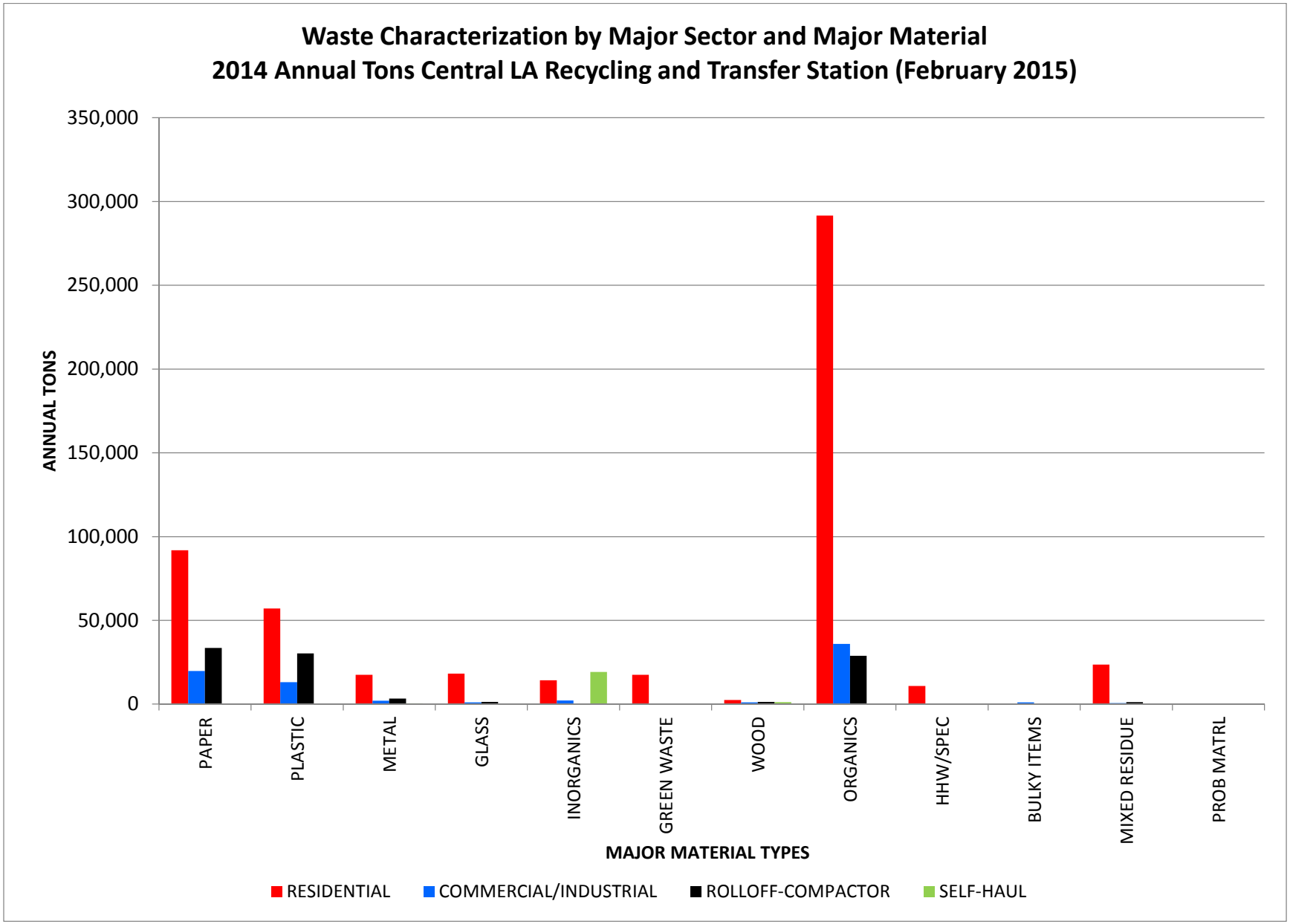
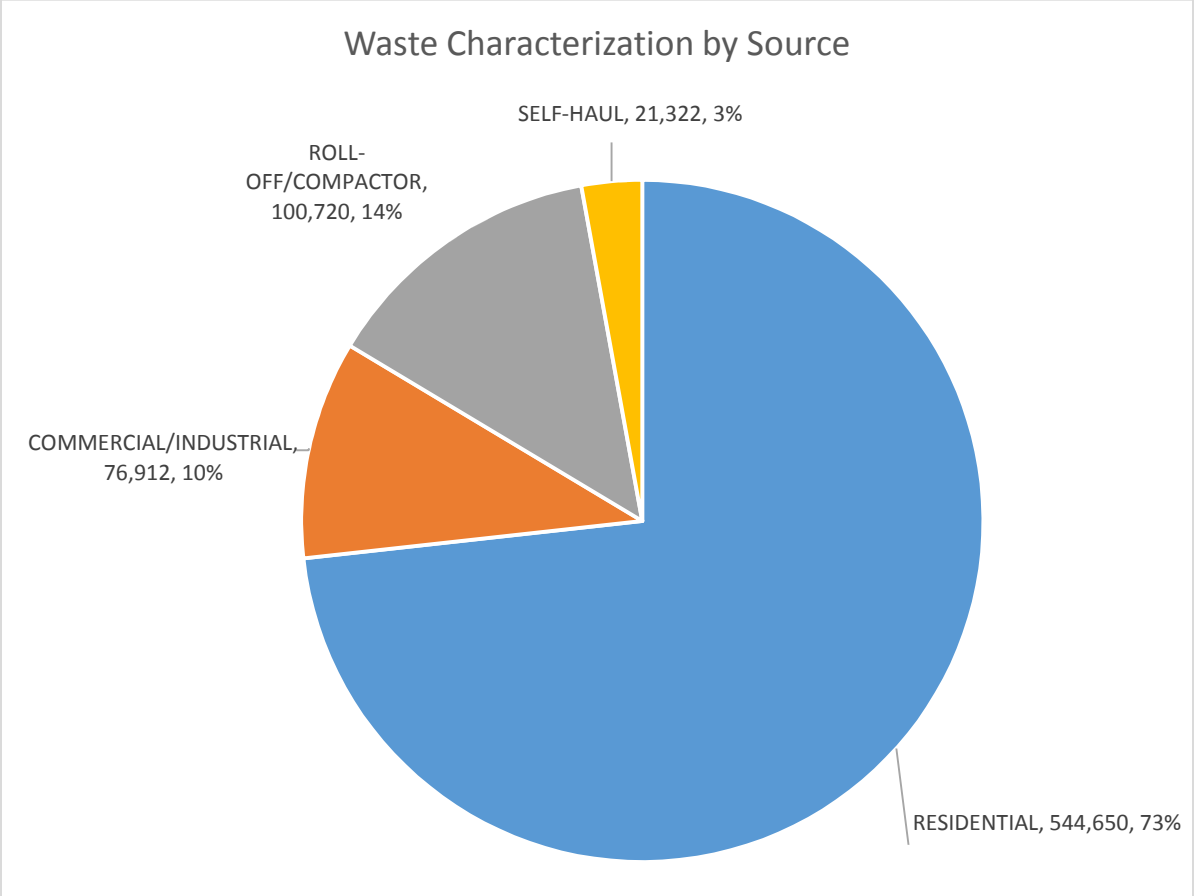


Figure 9 below is the distribution of the overall waste by each waste source. The waste sources are ranked from highest to lowest amount of waste: Residential, Roll-off/Compactor, Commercial/Industrial, and Self-Haul.

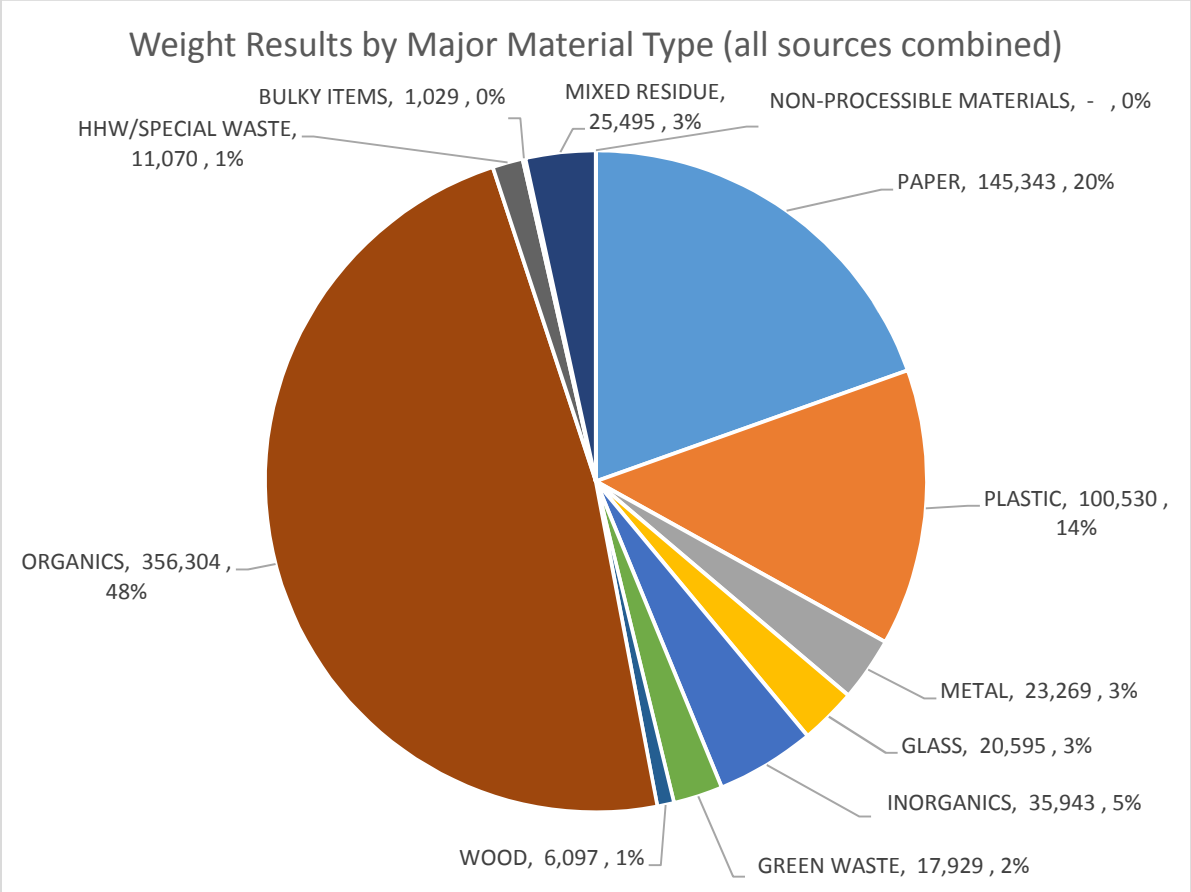
FIGURE 9 DISTRIBUTION OF WASTE BY SOURCE



Waste Source	Weight in Tons	Weight Percentage
Residential	544,650	73%
Roll-off/Compactor	100,720	14%
Commercial/Industrial	76,912	10%
Self-Haul	21,322	3%

Figure 10 below summarizes the weight in tons and weight percentage of each major material type found in all waste sources combined.

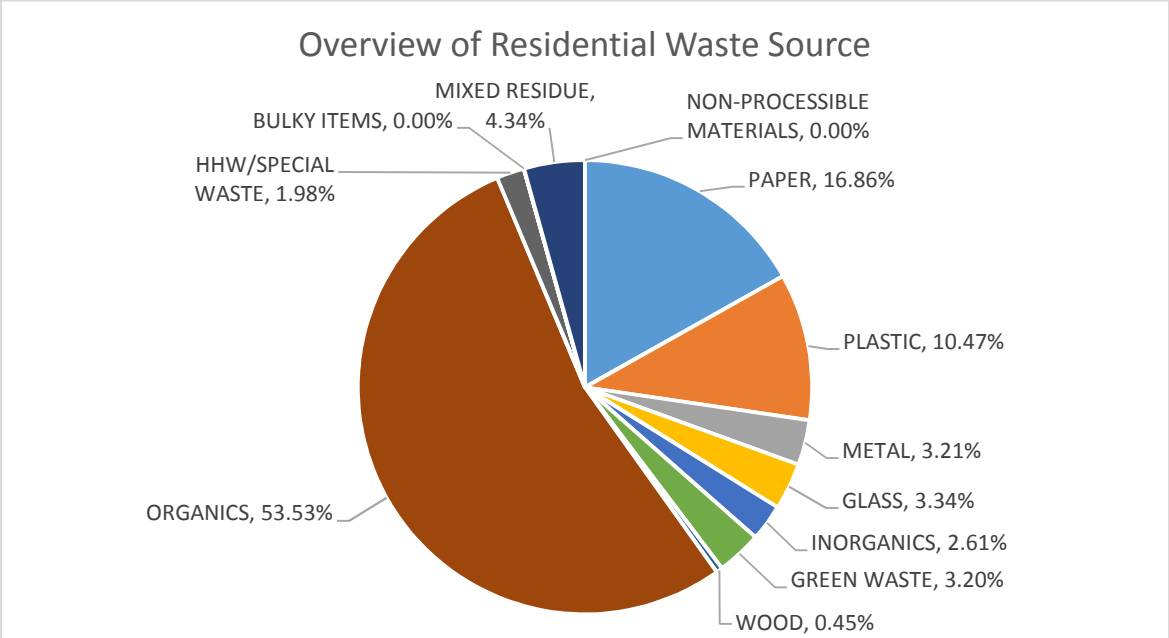
FIGURE 10 WEIGHT RESULTS BY MAJOR MATERIAL TYPE FROM ALL WASTE SOURCES COMBINED



Major Material Type (waste sources combined)	Weight in Tons	Weight Percentage
Paper	145,343	20%
Plastic	100,530	14%
Metal	23,269	3%
Glass	20,595	3%
Inorganics	35,943	5%
Green Waste	17,929	2%
Wood	6,097	1%
Organics	356,304	48%
Household Hazardous Waste/Special Waste	11,070	1%
Bulky Items	1,029	0%
Mixed Residue	25,495	3%
Non-Processible Material	-	0%

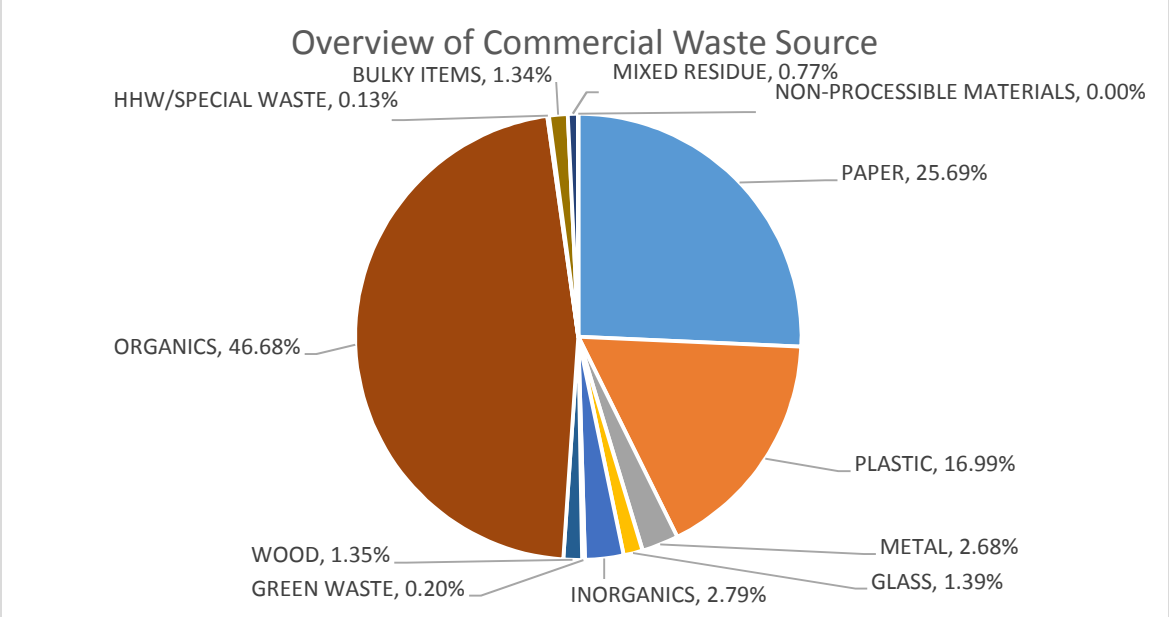
The following figures summarize the top three major material types by each source.

FIGURE 11 MAJOR MATERIAL TYPE OVERVIEW - RESIDENTIAL SOURCE



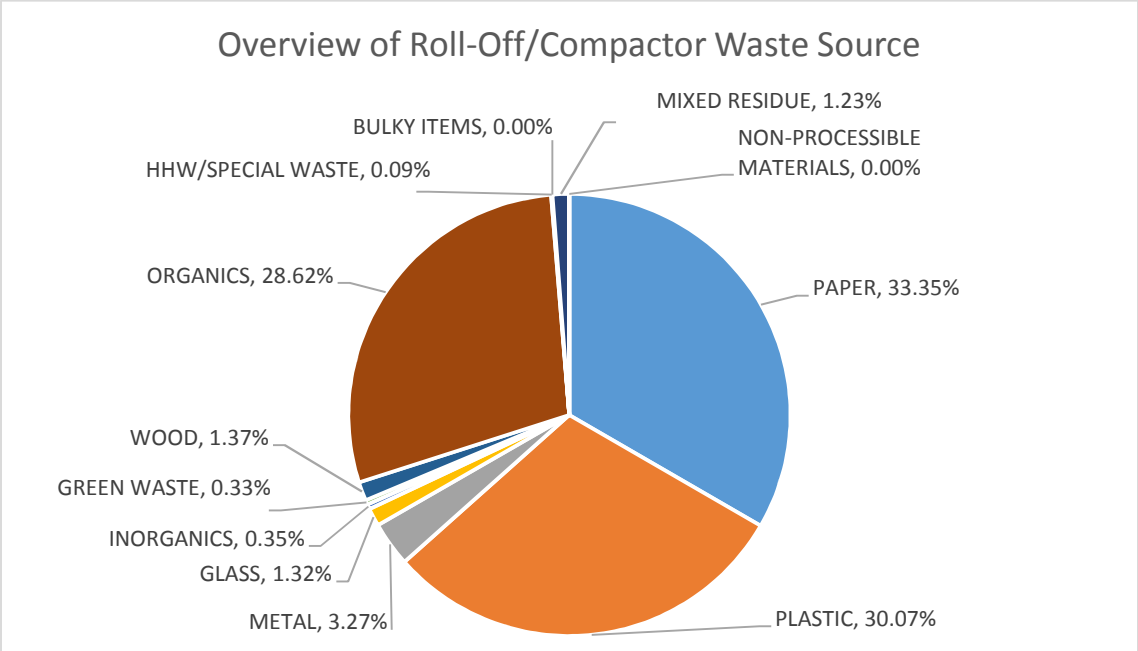
Residential	Weight Percentage
1. Organics	53.5%
2. Paper	16.9%
3. Plastic	10.5%

FIGURE 12 MAJOR MATERIAL TYPE OVERVIEW - COMMERCIAL/INDUSTRIAL SOURCE



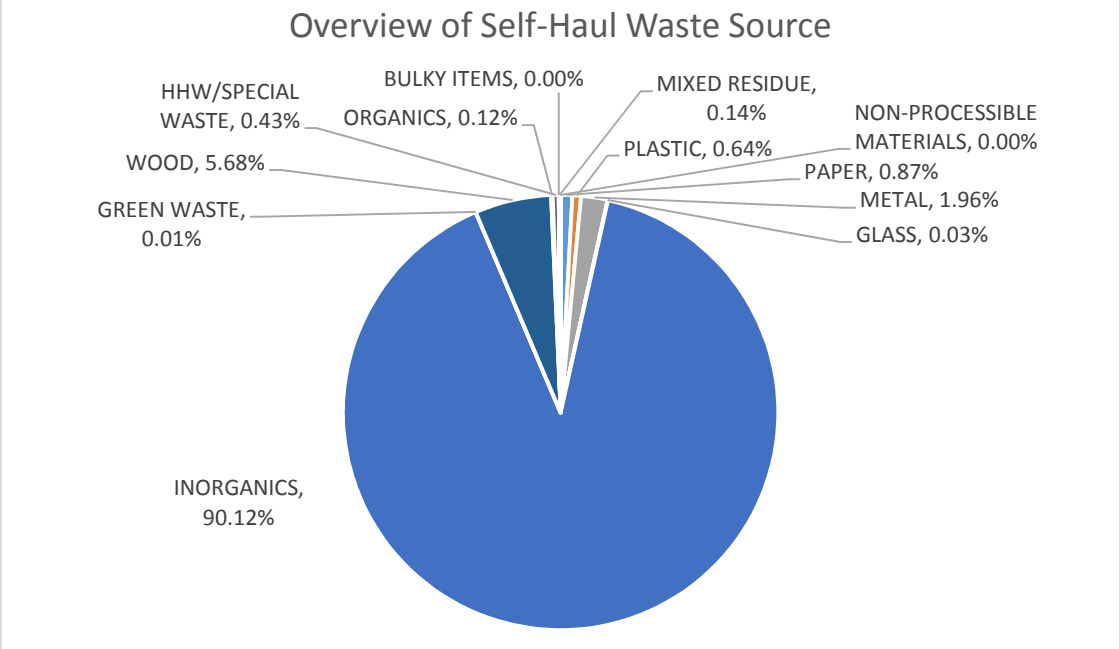
Commercial/Industrial	Weight Percentage
1. Organics	46.7%
2. Paper	25.7%
3. Plastic	17.0%

FIGURE 13 MAJOR MATERIAL TYPE OVERVIEW - ROLL-OFF/COMPACTOR SOURCE



Roll-Off/Compactor	Weight Percentage
1. Paper	33.4%
2. Plastic	30.1%
3. Organics	28.6%

FIGURE 14 MAJOR MATERIAL TYPE OVERVIEW - SELF-HAUL SOURCE



Self-Haul	Weight Percentage
1. Inorganics	90.1%
2. Plastic	5.7%
3. Organics	2.0%

Organics, Paper and Plastics were most prevalent in the Residential, Roll-Off/Compactor, and Commercial/Industrial sources. For more details about the weight results from each source, please refer to Table C in the Appendix D – Laboratory Test Reports, Material Type Sorting and Sizing Results.

4.2 Material Type Size Screening

Upon recording the amount of material collected from each source, the size of material collected from each source was measured using seven different sized screens (in inches). The size of the screens were: 2, 4, 6, 9, 12, 16, and 20 inches.

As done in the previous section, the material types were categorized into major groups. For example, Newspaper, Office paper, Compostable paper and similar material types are categorized as Paper. Table 2 summarizes the percentage (by weight) of the major material types from all sources that passed through each screen.

TABLE 2 SIZE SCREENING RESULTS BY MAJOR MATERIAL TYPE[3] (ALL SECTORS COMBINED)

Major Material Type	2"	4"	6"	9"	12"	16"	20"	+20"
Paper	4.0%	21.0%	17.9%	20.8%	18.9%	10.7%	5.5%	1.1%
Plastic	5.3%	22.0%	19.6%	24.1%	22.1%	4.8%	2.1%	0.0%
Metal	0.0%	86.4%	13.6%	0.0%	0.0%	0.0%	0.0%	0.0%
Inorganic	0.0%	0.4%	0.8%	1.5%	9.2%	5.0%	63.2%	19.9%
Green Waste	38.3%	7.5%	10.5%	5.8%	9.5%	15.9%	3.8%	8.7%
Wood	7.2%	13.3%	19.7%	37.8%	22.1%	0.0%	0.0%	0.0%
Organic	8.2%	34.2%	20.7%	5.1%	15.7%	7.8%	8.3%	0.0%
Mixed Residue	90.5%	9.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Household Hazardous Waste (HHW)	10.8%	5.9%	1.6%	3.8%	28.6%	49.2%	0.0%	0.0%

The cells highlighted in the above table indicate what size the majority of each material type is. For example, 34.2% of all organic material was 4 inches. This could be attributed to a majority of the organic waste being some type of food scrap.

[3] The weight percentage for each major material type is based on the 2014 annual tonnage for each material type

The following tables and charts display the size distribution of each major material type.

FIGURE 15 SIZE SCREENING OVERVIEW – PAPER MAJOR MATERIAL TYPE

Major Material Type	2”	4”	6”	9”	12”	16”	20”	+20”
Paper	4.0%	21.0%	17.9%	20.8%	18.9%	10.7%	5.5%	1.1%

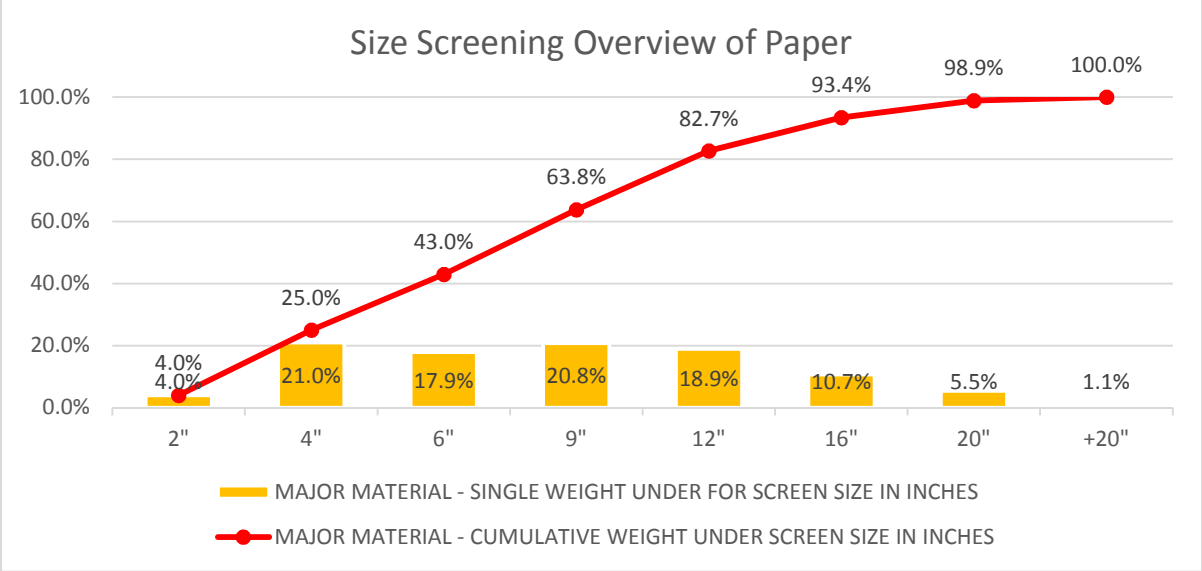


FIGURE 16 SIZE SCREENING OVERVIEW – PLASTIC MAJOR MATERIAL TYPE

Major Material Type	2”	4”	6”	9”	12”	16”	20”	+20”
Plastic	5.3%	22.0%	19.6%	24.1%	22.1%	4.8%	2.1%	0.0%

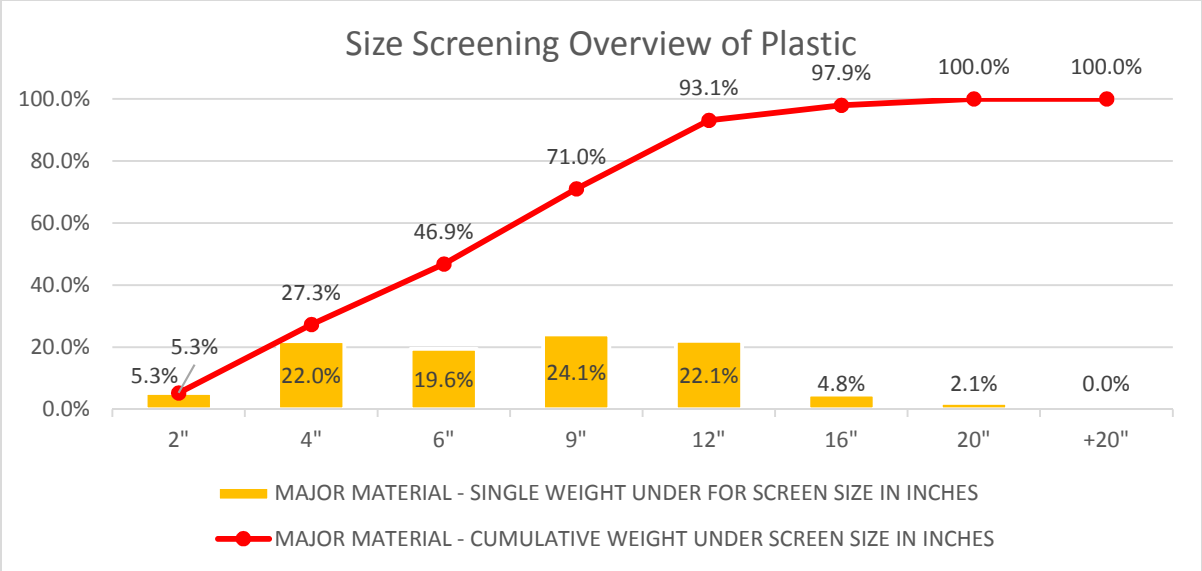


FIGURE 17 SIZE SCREENING OVERVIEW – METAL MAJOR MATERIAL TYPE

Major Material Type	2”	4”	6”	9”	12”	16”	20”	+20”
Metal	0.0%	86.4%	13.6%	0.0%	0.0%	0.0%	0.0%	0.0%

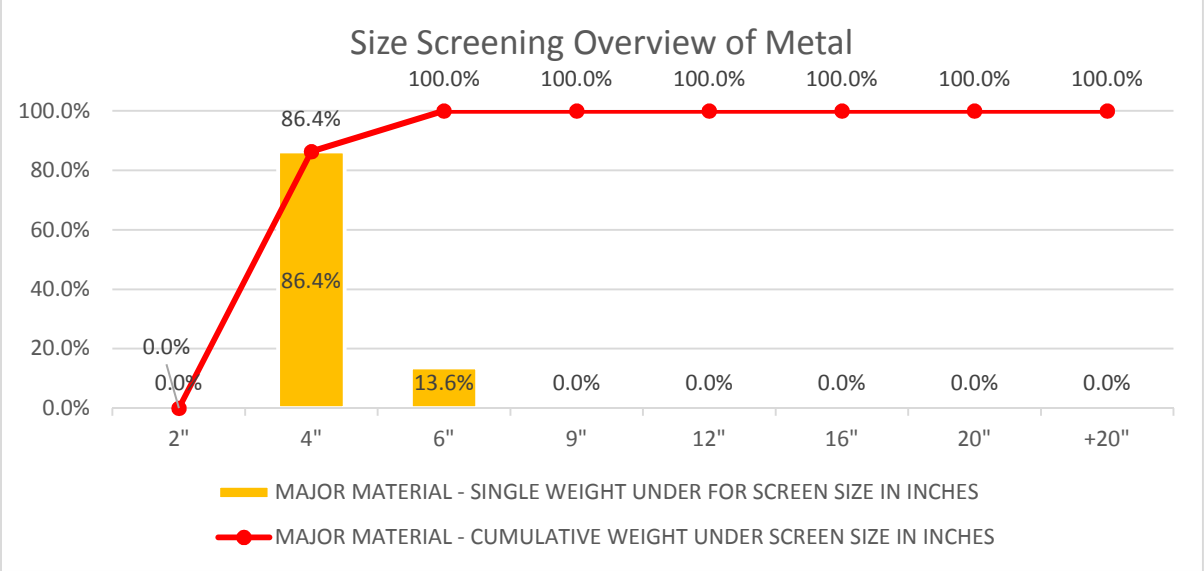


FIGURE 18 SIZE SCREENING OVERVIEW – INORGANIC MAJOR MATERIAL TYPE

Major Material Type	2”	4”	6”	9”	12”	16”	20”	+20”
Inorganic	0.0%	0.4%	0.8%	1.5%	9.2%	5.0%	63.2%	19.9%

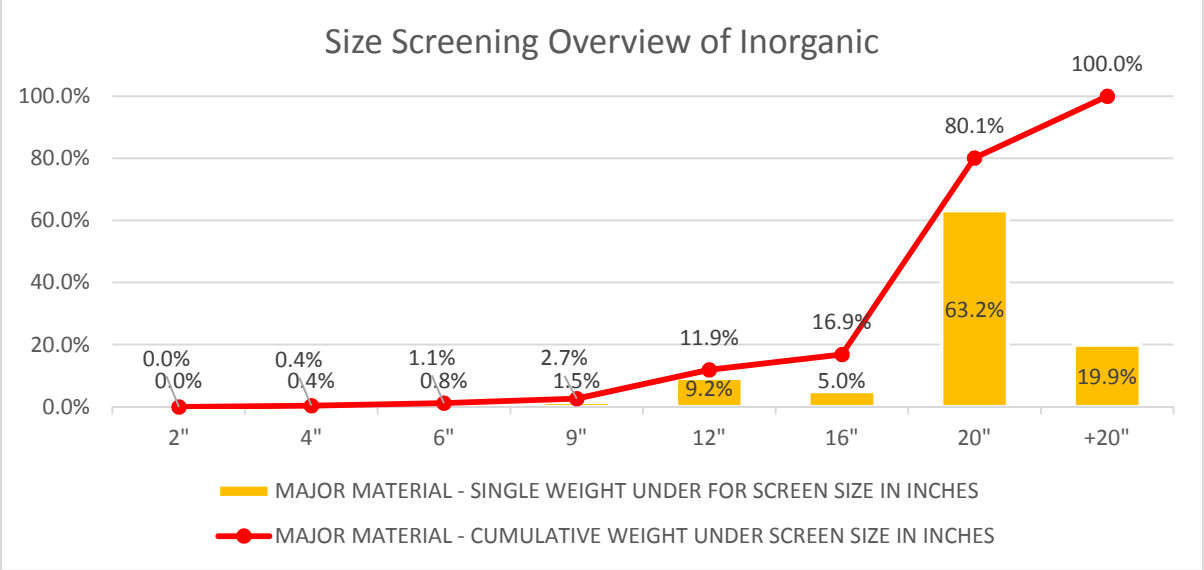


FIGURE 19 SIZE SCREENING OVERVIEW – GREEN WASTE MAJOR MATERIAL TYPE

Major Material Type	2”	4”	6”	9”	12”	16”	20”	+20”
Green Waste	38.3%	7.5%	10.5%	5.8%	9.5%	15.9%	3.8%	8.7%

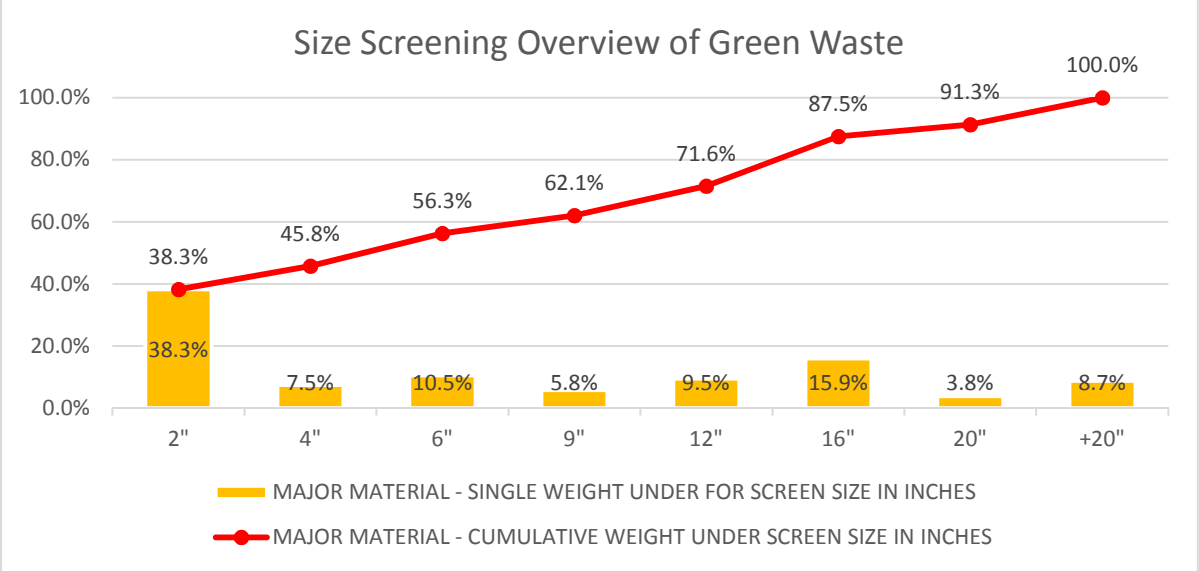


FIGURE 20 SIZE SCREENING OVERVIEW – WOOD MAJOR MATERIAL TYPE

Major Material Type	2”	4”	6”	9”	12”	16”	20”	+20”
Wood	7.2%	13.3%	19.7%	37.8%	22.1%	0.0%	0.0%	0.0%

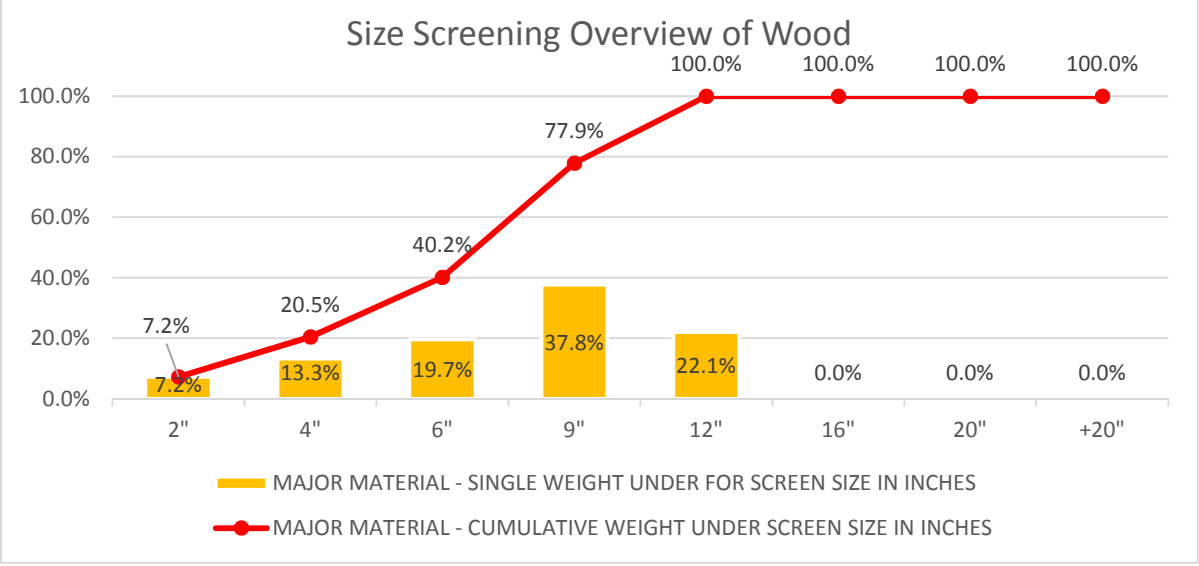


FIGURE 21 SIZE SCREENING OVERVIEW – ORGANIC MAJOR MATERIAL TYPE

Major Material Type	2”	4”	6”	9”	12”	16”	20”	+20”
Organic	8.2%	34.2%	20.7%	5.1%	15.7%	7.8%	8.3%	0.0%

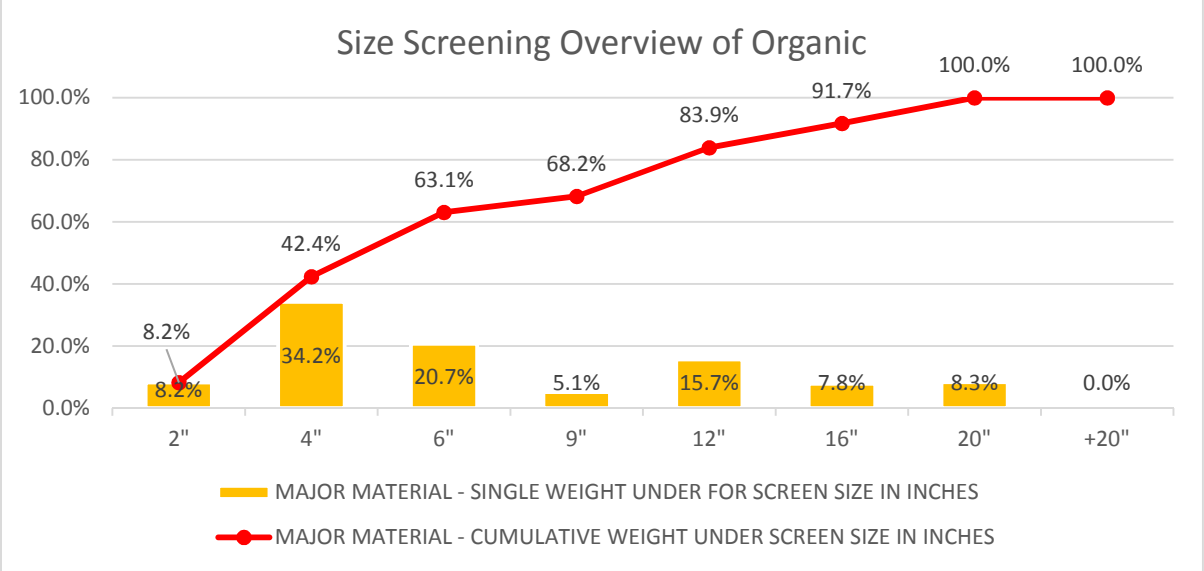


FIGURE 22 SIZE SCREENING OVERVIEW – MIXED RESIDUE MAJOR MATERIAL TYPE

Major Material Type	2”	4”	6”	9”	12”	16”	20”	+20”
Mixed Residue	90.5%	9.5%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%

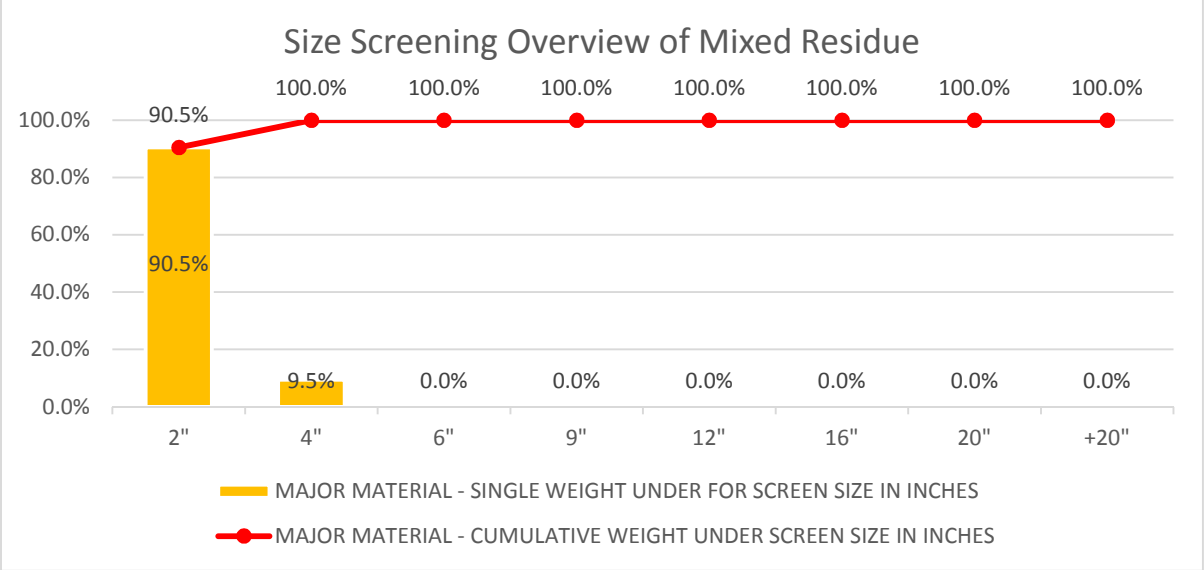
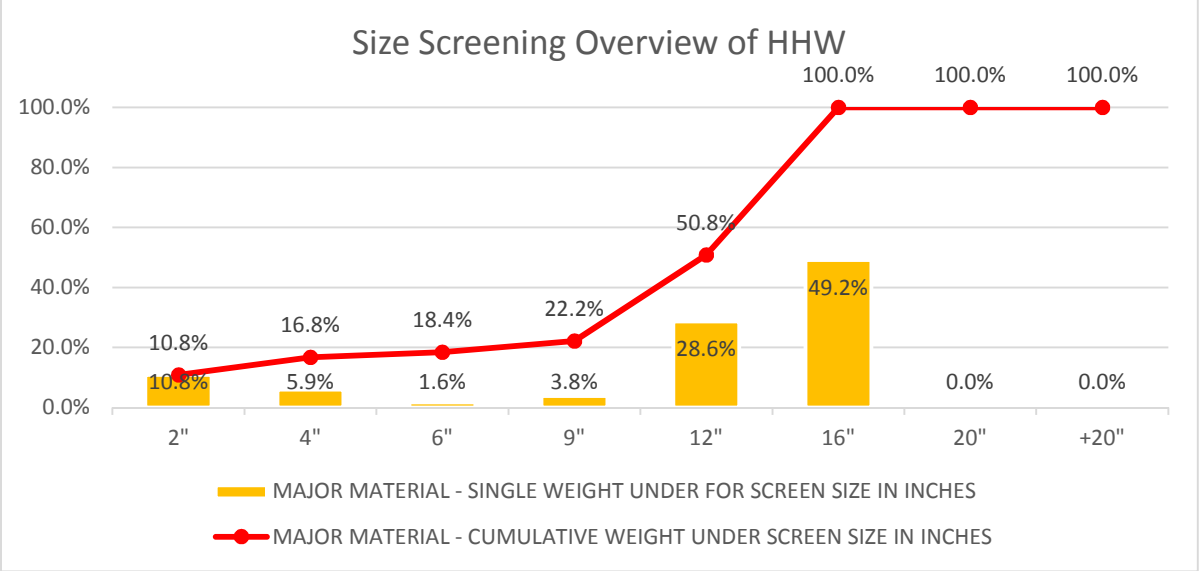


FIGURE 23 SIZE SCREENING OVERVIEW – HOUSEHOLD HAZARDOUS WASTE MAJOR MATERIAL TYPE

Major Material Type	2”	4”	6”	9”	12”	16”	20”	+20”
Household Hazardous Waste (HHW)	10.8%	5.9%	1.6%	3.8%	28.6%	49.2%	0.0%	0.0%



For more details about the size of each material type, please refer to Table C in the Appendix D – Laboratory Test Reports, Material Type Sorting and Sizing Results.

4.3 Biological Methane Potential Analysis

The purpose of the Biological Methane Potential analysis is to provide information on the potential amount of biogas that could be generated at the landfill. Woods End Laboratories conducted a 21 day analysis for the BMP of two samples from each waste source.

Figure 24 and 25 below are results from the BMP analysis showing the amount of biogas generated as well as the percent of methane of the two samples from each waste source.

FIGURE 24 BIOLOGICAL METHANE POTENTIAL – CUMULATIVE BIOGAS GENERATED

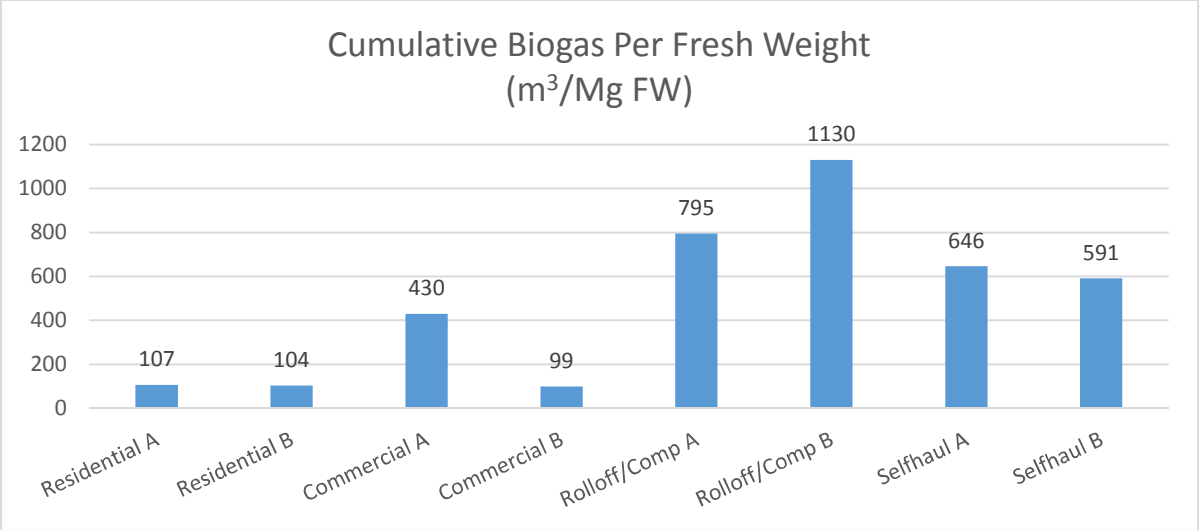
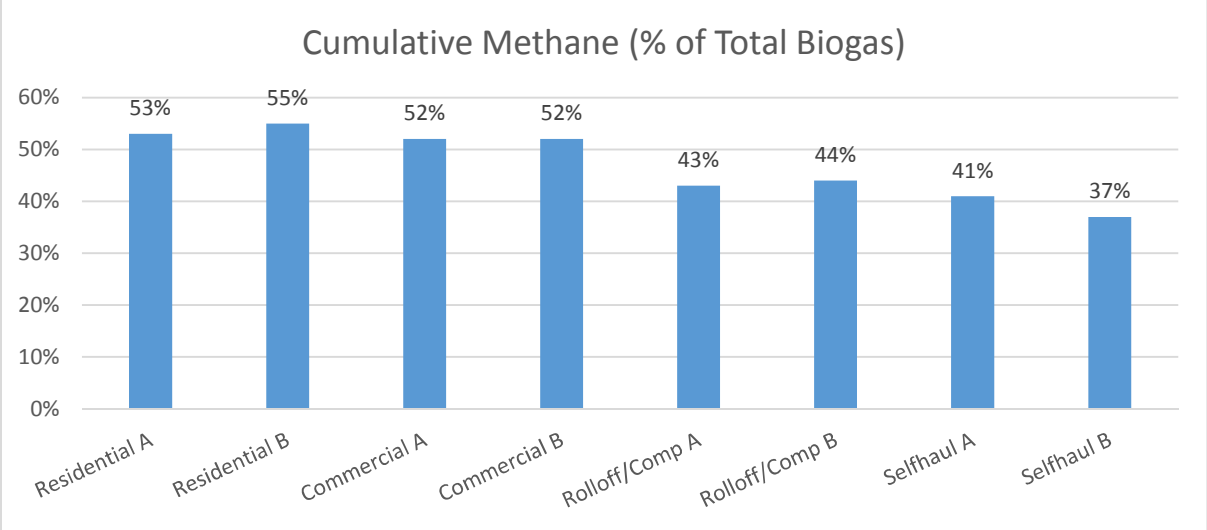


FIGURE 25 BIOLOGICAL METHANE POTENTIAL - METHANE PERCENTAGE



Both the Residential and Self-Haul sources were consistent in the amount of produced biogas. However biogas production from the Commercial and Roll-Off/Compactor samples varied due to the amount of organics in the samples sent to the laboratory. The percentage of methane in the biogas from each source ranged between 37 to 55%.

For Residential loads, both samples were similar in composition containing a mixture of organics, paper and plastics. The following are pictures of both Residential loads and graphs from the laboratory showing the amount of biogas generated by each sample during the analysis.

FIGURE 26 RESIDENTIAL A LOAD

Sample ID: Feedstock: Mixed Waste: Resident. A

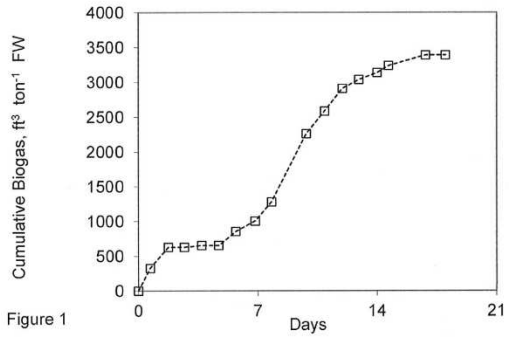


Figure 1

FIGURE 27 RESIDENTIAL B LOAD

Sample ID: Feedstock: Mixed Waste: Resident. B

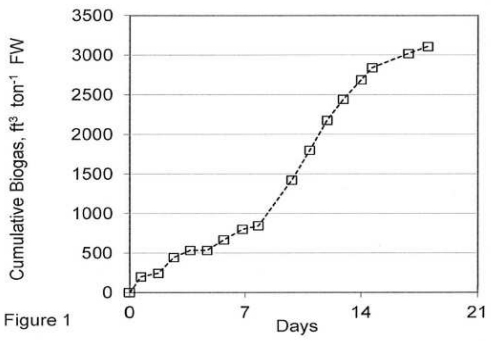


Figure 1

Both Commercial A and B loads were from commercial sources. The load from Commercial A contained more organic matter than the Commercial B load. The following are pictures of Commercial A and Commercial B loads and graphs from the laboratory showing the amount of biogas generated by each sample during the analysis.

FIGURE 28 THE COMMERCIAL A LOAD CONTAINED A LOT OF FOOD AND OTHER ORGANIC MATERIAL

Sample ID: Feedstock: Mixed Waste: Commer. A

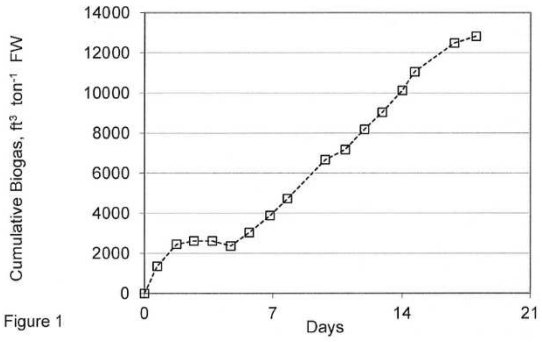


Figure 1

FIGURE 29 THE COMMERCIAL B LOAD CONTAINED "OFFICE-LIKE" MATERIAL SUCH AS PAPER AND PLASTIC

Sample ID: Feedstock:Mixed Waste: Commer. B

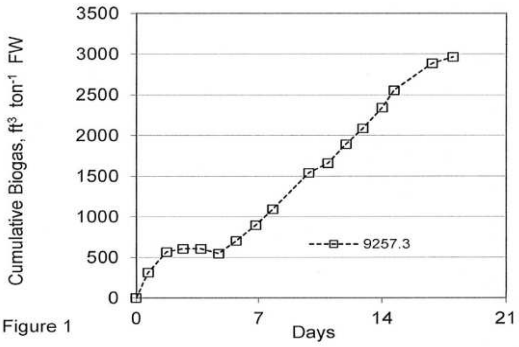


Figure 1

Loads from Roll-Off/Compactors A and Roll-Off/Compactors B generated the highest amounts of Biogas due to their source of generation. Roll-Off/Compactor A was from a meat processing facility and Roll-Off/Compactor B was from a supermarket. The following are pictures of the Roll-Off/Compactor loads and graphs from the laboratory showing the amount of biogas generated by each sample during the analysis.

FIGURE 30 ROLL-OFF/COMPACTOR A WAS FROM A MEAT PROCESSING FACILITY

Sample ID: Feedstock: Rolloff, Compactor A

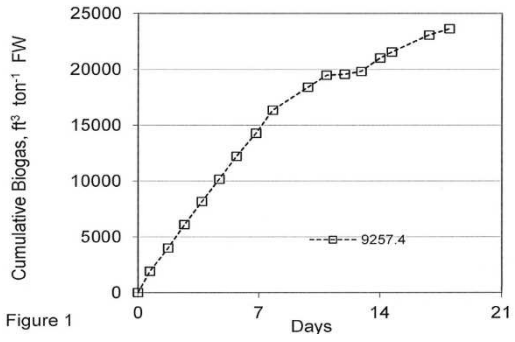


Figure 1

FIGURE 31 ROLL-OFF/COMPACTOR B WAS FROM A SUPERMARKET

Sample ID: Feedstock: Rolloff, Compactor B

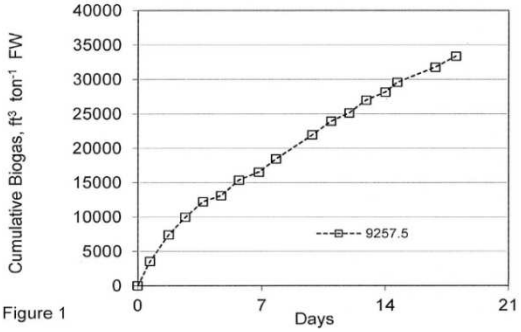


Figure 1

Self-Haul Loads A and Self Haul B contained Construction and Demolition material. The following are pictures of the loads and graphs from the laboratory showing the amount of biogas generated by each sample during the analysis.

FIGURE 32 SELF HAUL A CONSISTED MOSTLY OF FLOORING MATERIAL

Sample ID: Feedstock: Self Haul A

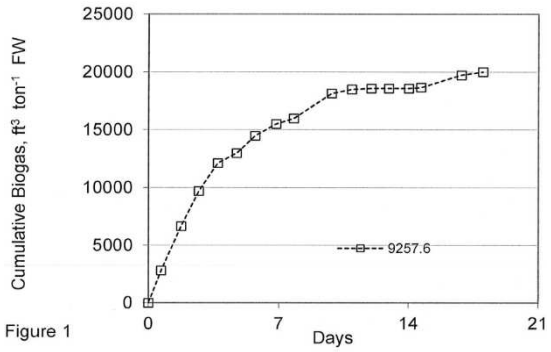


Figure 1

FIGURE 33 SELF HAUL B CONSISTED OF HOME CONSTRUCTION WASTE

Sample ID: Feedstock: Self Haul B

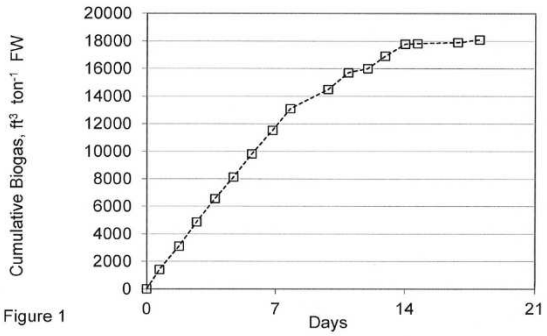


Figure 1

4.4 Chemical and Physical Analyses: Proximate, Ultimate, and Heating Value (BTU)

ALS Environment conducted the Proximate, Ultimate, and Heating Value Analyses. The Proximate Analysis measured each sample for: Total Moisture, Volatile Matter, Fixed Carbon and Ash. Table 3 below identifies the top three material types for each of the measurements.

TABLE 3 PROXIMATE ANALYSIS RESULTS

Total Moisture	**Weight Percentage**
Results Range:	0.41% to 73.73%
1. Food	73.73%
2. Remainder Composite (R/C) Misc. Organics	67.31%
3. Green/Yard Waste	58.32%
Volatile Matter	**Weight Percentage**
Results Range:	40.8% to 99.25%
1. HDPE Bottles/Containers	99.25%
2. Other Bottles/Containers	97.62%
3. R/C Plastics	93.67%
Fixed Carbon	**Weight Percentage**
Results Range:	<0.01% to 17.5%
1. Untreated/Clean Wood	17.5%
2. Branches/Twigs/Stumps	16.86%
3. Cardboard & Kraft	12.64%
Ash	**Weight Percentage**
Results Range:	<0.68% to 60.4%
1. Mixed Residue	60.4%
2. R/C Misc. Organics	49.66%
3. Green/Yard Waste	21.35%

The Ultimate Analysis measured each sample for the following: Carbon, Hydrogen, Nitrogen and Sulfur. Table 4 below list top three material types for each of the elements.

TABLE 4 ULTIMATE ANALYSIS RESULTS

Carbon	**Weight Percentage**
Results Range:	23.95% to 81.35%
1. HDPE Bottles/Containers	81.35%
2. Other Bottles/Containers	80.11%
3. R/C Plastics	74.41%
Hydrogen	**Weight Percentage**
Results Range:	2.35% to 12.8%
1. HDPE Bottles/Containers	12.8%
2. Other Bottles/Containers	11.62%
3. Plastic Film/Wrap	11.47%
Nitrogen	**Weight Percentage**
Results Range:	<0.05% to 4.19%
1. Food	4.19%
2. R/C Misc. Organics	1.87%
3. Green/Yard Waste	1.54%
Sulfur	**Weight Percentage**
Results Range:	0.011% to 0.826%
1. Rubber	0.826%
2. Textiles & Leathers	0.461%
3. Mixed Residue	0.436%

Table 5 below lists the three material types with the highest Heating Values:

TABLE 5 HEATING VALUE (BTU) ANALYSIS RESULTS

Heating Value	**BTU/lb**
Results Range:	3,630 to 19,022
1. HDPE Bottles/Containers	19,022
2. Other Bottles/Containers	17,091
3. Plastic Film/Wrap	16,334

For complete laboratory results from the Proximate, Ultimate, and BTU analyses please refer to Table B of Appendix D – Laboratory Test Reports, Material Type Sorting and Sizing Results.

APPENDIX A
Waste Characterization Study Protocol

Supplemental Studies to the Biannual Waste Characterization Study at Sunshine Canyon Landfill

Goals / Objectives and Data Utilization:

The goal and objective of this additional waste characterization study is to supplement the required biannual "material type" waste characterization studies at Sunshine Canyon Landfill (SCL) to obtain information that can be utilized in developing mitigation measures to eliminate landfill odors, and will provide technical information that can be utilized to update factors utilized in various landfill gas generation models. The past and current material type classification studies' protocols have the primary purpose of determining the amount of recyclable waste that is being disposed at landfill. The supplemental studies will provide additional information on the chemical and physical properties of selected wastestreams received at Sunshine Canyon Landfill.

The following are a list of potential supplemental characterization analyses that can be conducted to enhance the existing study to provide critical information that can be utilized for developing landfill odor mitigation measures and/or for providing information that would enhance the design and efficiency/performance of the overall landfill gas collection system.

The waste characterization data is also useful for the development of better diversion programs and diversion facilities (e.g., material recovery facility (MRF) or integrated MRFs with conversion technologies, etc.) to reduce the amount of overall waste being disposed at landfills. The data will also be useful for identifying programs and understanding the waste composition/materials and the materials that are targeted for diversion under AB 1825 Organics Recycling, AB 1126 Engineered MSW Facility, SB 498 Biomass Conversion, and AB 341 Mandatory Commercial Recycling. The data will also be helpful in calculating the potential greenhouse gas emissions reduction from the implementation of various diversion programs.

The study will be completed during the "wet season", when the number of odors complaints are the highest, and when the waste composition may be very different because of the concentration of holidays, e.g., with much higher food waste. Almost all of the previous waste composition studies that have been done at a time that is

considered “representative”. Results from this focused study during the wet holiday season can be very informative.

Data to be Collected:

1. Waste Composition by Material Type (by Sector)

- Residential Waste
- Commercial/Industrial Waste (Front Loaders)
- Transfer Trailers
- Rolloff/Compactors

Trucks from each of the four main sources 1) residential waste, 2) commercial/industrial waste, 3) transfer trailers, and 4) rolloff/compactors will be randomly selected for sampling. Selected trucks will be notified at the scale-house that they have been selected to participate in the characterization study, and will be directed to a location where the trucks can unload in a fashion similar to a long windrow. A loader shall be used to remove a portion of the waste from the “center” of each load and taken over to the sorting site which is located safely away from the landfill’s working face. The load will be placed on a tarp, and the sample size will be reduced through a “cone and quarter” process until the CalRecycle’s Uniform Waste Characterization Method recommended sample size of approximately 200 pounds is achieved. The sample will be photographed and labeled, and set aside.

The representative sampling methods and classification protocols are to be consistent with the CalRecycle Uniform Waste Characterization Method, and technical requirements for waste characterization under AB 939 *((California Integrated Waste Management Act of 1989) regulations described in the California Code of Regulations (Title 14) Sampling Procedure for Waste Characterization Study)*

Samples will be taken on Monday and Wednesday of the week. Each sample will be separated into the CalRecycle “Material Type” classifications as defined in the CalRecycle Uniform Material Type Definitions which is included in the Attachment section or online at http://www.calrecycle.ca.gov/WasteChar/MatDefs.htm. The total weight of each bin and sorted material will be recorded (including the previously recorded weight of the container). This data will determine the relative percentage of material types in the collected samples and is also the basis for the waste composition for each of the four sources. This data will be compared to previous composition study data and with sampling done during different times of the year. A total of five (5) individual “samples”[1] taken from each of the four sources, (200 lbs each) or a total of 20 “samples” will be characterized by “material

types". Photographs of each "sample" will be taken with an individual sample identification number, and[4] identification of the type of load.

Data will be used for determining the relative percentage of material types in the collected samples. This data will also be compared with previous composition study data (and compared with sampling done during different times of the year).

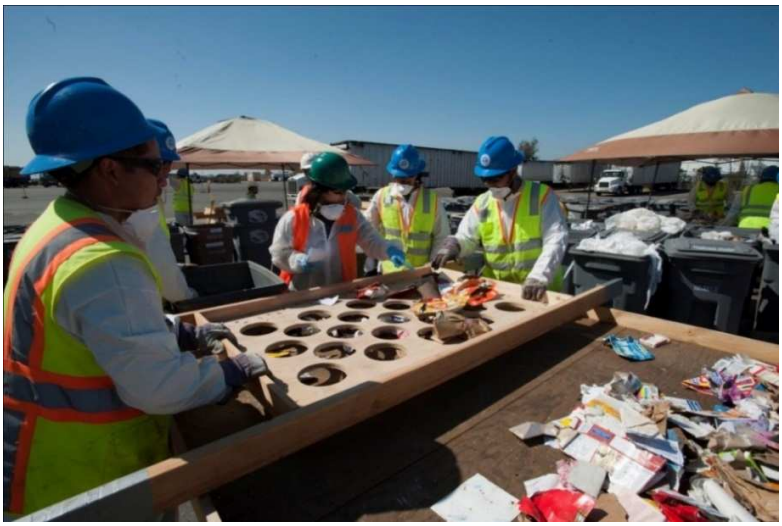
2. Cumulative Sizing (Of Various Material Types)

Cumulative sizing range analysis provides data on the size and shape of the various material types. Information on size and shape of materials in conjunction with landfill operations (e.g., layering, etc.) are important factors on why horizontal permeability is greater than vertical permeability. For example, larger pieces of film plastic in-place form localized barriers to movement of gas and liquids. Cumulative sizing also provides useful materials handling data for equipment manufacturers.

Cumulative Sizing Screen Description / Sizes:

Size Screens: The overall dimension should be about 3 feet by 4 feet (with the handles/grips on opposite sides so two people can grab and shake the screen over a sorting table. The holes should be round (circular) in shape for the smaller sizes, and can be square for the larger sizes (12" or larger).

Smaller size screens can be holes drilled in plywood, and or wire screens (square holes). Screen should be light enough for two people to lift and shake, with approximately 20 pound of materials at a time. Sizes Needed: 2 inches, 4", 6", 9", 12", 16", 20" (Distance between two handles is 3' (three feet),



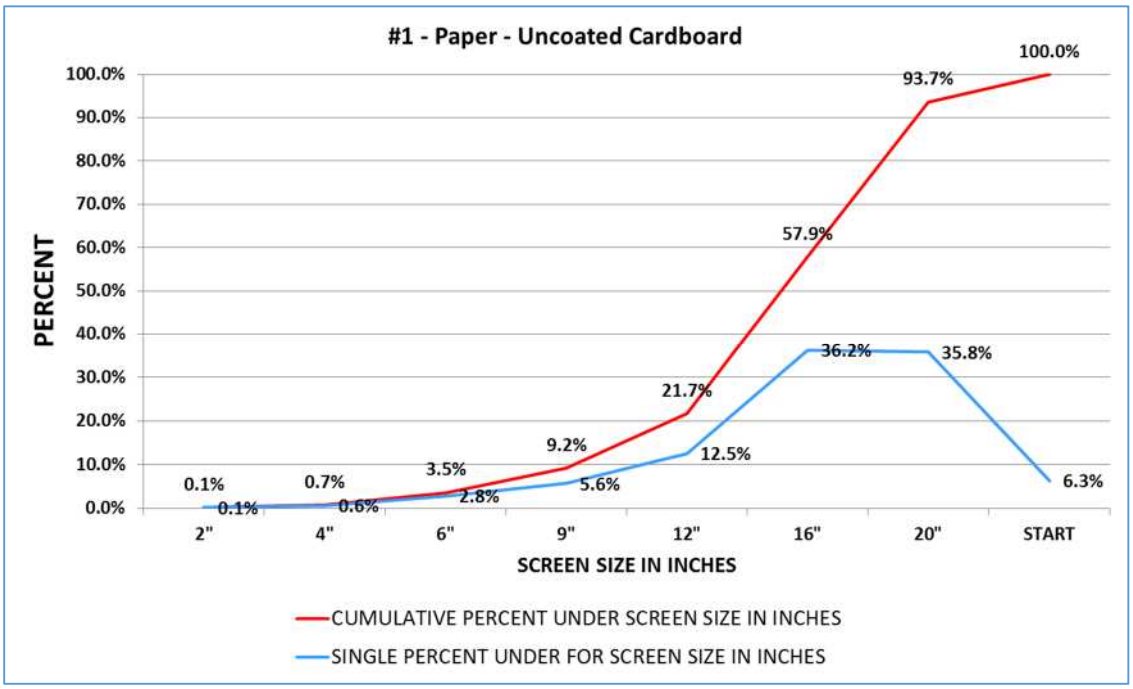
[4] "Sample" here refers to an individual truck/load

Material Types to be Sized / Screened:

- OCC (Recyclable)/Kraft
- Newspaper
- Office Paper
- Mixed Recyclable Paper (Magazines, chipboard boxes, etc.)
- Compostable Paper (napkins, paper towels, tissues, etc.)
- R/C Non-Recyclable Paper (Coated OCC, laminated paper, etc.)
- #1 PET Bottles/Containers
- #2 HDPE Bottles/Containers
- Other Bottles/Containers
- Plastic Film/Wrap
- Plastic Products (durable goods)
- R/C Plastic
- Aluminum Cans
- Tin/Steel Cans
- Other Ferrous Metals
- Other Non-Ferrous Metals
- R/C Mixed Metals/Other Materials
- Glass Bottles (Recyclable)
- Other Glass (Non-Recyclable)
- R/C Glass and Other Materials
- Green/Yard Waste (Leaves/Grass)
- Branches / Twigs
- Stumps (> 4" diameter)
- Untreated / Clean Wood
- Treated Wood
- Pallets
- Food
- Textiles/ Leathers
- Rubber
- Carpet / Padding
- R/C Miscellaneous Organics
- Mixed Residue
- Inorganics (included as one material type):
  - C&D (Bricks, Tiles, etc.)
  - Ceramics
  - Sand/Rocks/Dirt
  - Other / Miscellaneous Inorganics

- HHW (include as one material type)
  - Pesticides/Herbicides
  - Paints/Adhesives/Solvents
  - Household Cleaners
  - Automotive Fluids and Other (wax, polish, etc.)
  - E-Waste (Electronics, computers, CRT, etc.)
  - Other HHW/Special Waste

Cumulative sizing data will be compiled into a spreadsheet format and presented as individual material passing size percentage, and as cumulative percentage passing each selected size. Data to be presented in raw data form and in graphical format, consistent with the example below:



Graphics provided courtesy of the City of Oxnard, Waste Composition Study (March 2014)

3. Ultimate Analysis and Proximate Analysis (Of Various Material Types)

Ultimate and Proximate analyses will provide the elemental analysis (carbon, nitrogen, sulfur, etc.), ash content, and moisture content of various material types. This analysis will provide data on the inorganic (e.g., ash) portion of the materials, and will also identify materials that have sulfur content (e.g., drywall). The Proximate & Ultimate with calculated Oxygen protocol: ASTM D3176-89, ASTM PD4239-11, ASTM D5373-08, ASTM D7582-10

Moisture content data of individual material types will enable the calculation and/or projection of total moisture content for mixed MSW composition studies, and will provide data that can be used in determining the amount of leachate, and in landfill gas generation models. Moisture content is included as part of the Ultimate Analysis / Proximate Analysis ASTM D3176-89, ASTM D4239-11, ASTM D5373-08, ASTM D7582-10.

The previously sorted materials are then put into a separate “consolidation container” for each of the following material types for the physical/chemical tests.

- OCC (Recyclable)/Kraft
- Newspaper
- Office Paper
- Mixed Recyclable Paper (Magazines, chipboard boxes, etc.)
- Compostable Paper (napkins, paper towels, tissues)
- R/C Non-Recyclable Paper (Coated OCC, laminated paper, etc.)
- #1 PET Bottles/Containers
- #2 HDPE Bottles/Containers
- Other Bottles/Containers
- Plastic Film/Wrap
- Plastic Products (durable goods)
- R/C Plastic
- Green/Yard Waste (Leaves/Grass)
- Branches / Twigs / Stumps (> 4" diameter)
- Untreated / Clean Wood / Pallets
- Treated Wood
- Food Waste
- Textiles/ Leathers
- Rubber
- Carpet / Padding
- R/C Miscellaneous Organics
- Mixed Residue

4. Heating Value (BTU analysis)

The BTU analysis provides information on the calorific value for various material types, and will provide information on the potential energy recovery value of the materials that are currently being disposed. Heating Value (BTU) Analysis: ASTM D5865-10ae1.

This heating value information can be used to develop conversion technology projects focused on recovering the bound chemical energy within the organic fraction of each of the material types. Materials to be analyzed include:

- OCC (Recyclable)/Kraft
- Newspaper
- Office Paper
- Mixed Recyclable Paper (Magazines, chipboard boxes, etc.)
- Compostable Paper (napkins, paper towels, tissues)
- R/C Non-Recyclable Paper (Coated OCC, laminated paper, etc.)
- #1 PET Bottles/Containers
- #2 HDPE Bottles/Containers
- Other Bottles/Containers
- Plastic Film/Wrap
- Plastic Products (durable goods)
- R/C Plastic
- Green/Yard Waste (Leaves/Grass)
- Branches / Twigs / Stumps (> 4" diameter)
- Untreated / Clean Wood / Pallets
- Treated Wood
- Food Waste
- Textiles/ Leathers
- Rubber
- Carpet / Padding
- R/C Miscellaneous Organics
- Mixed Residue

5. Biological Methane Potential (BMP of Various Wastestreams) and Moisture Content

This analysis provides information on moisture content and the amount and rate of methane generation from the organic components of the mixed municipal solid waste stream. Samples of the mixed wastestream are taken from the following:

- Residential Waste
- Commercial/Industrial Waste (Front Loaders)
- Transfer Trailers
- Rolloff/Compactors

Biological Methane Potential (BMP) Analysis protocol: Woods End Method GB21 - Biogas Rate Test, 21-day, EC Method, includes Total Solids and Volatile Solids (TS/VS).

This data can be a comparative reference to the existing factors used in various landfill gas generation models. The data is also useful to the development of projects that target the organics portion of the wastestream, e.g., composting, high solids dry fermentation anaerobic digestion or traditional wet anaerobic digestion projects, or source separation diversion programs as mandated by recently passed California legislation, AB 1826 Organics Recycling.

Data Limitations:

Waste characterization data has a number of limitations:

- Waste characterization data is only a "snapshot in time", and should be utilized accordingly. For a more complete characterization, multiple studies during the different times of the year should be done.

- For statistically representative sampling, the more samples the better the overall accuracy and reliability (and confidence level). This is a very limited study because of budget constrain. More samples for determining material types and chemical/physical properties on the source loads and on the various materials types should be done to increase data reliability.

- Seasonality needs to be determined and addressed if a waste composition data is to be utilized in a calculation of composition for it the overall waste received during the entire year. The CalRecycle recommendation is a minimum of a two season sort, with the caveat that a "season" is not necessarily a "weather season". "Season" can be wet/dry, or can be any factor or combination of factors that may significantly change the overall composition by materials types, but also change the physical and/or chemical "characteristics", of the waste stream.

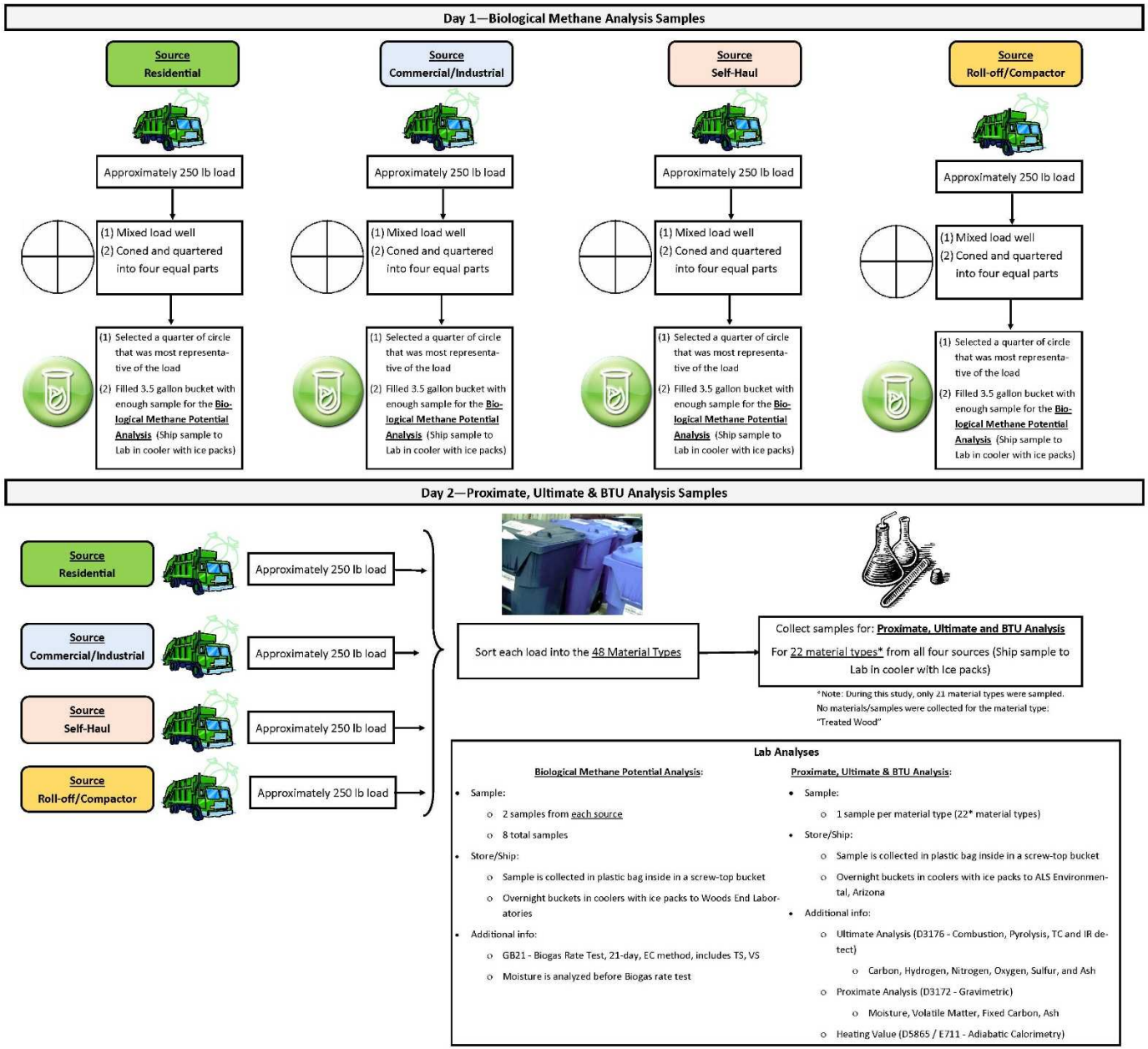
Other Information:

The Community Advisory Committee (CAC) will work cooperatively with and the Sunshine Canyon Landfill Local Enforcement Agency (LEA) to discuss and prioritize the type of additional studies, needed tasks, and to coordinate the additional sample collection, data analysis, and other field activities. The CAC is requesting the SCL LEA to manage and conduct technical oversight of the additional analyses.

The SCL LEA will assist the CAC in providing technical oversight on the composition study and will help review raw data, compiled data, and data analysis. The SCL LEA will assist the CAC in the RFP process in selecting one or more of the contractors/subcontractors previously approved by the SCL LEA Board of Directors. The CAC shall pay the contractor directly for the waste composition study.

The study protocols are subject to the approval of Republic Services before the start of the study if the work is to be done at the landfill. The field work will take place over a period of one to two weeks at Sunshine Canyon Landfill (or at another designated location, e.g., Transfer Station). The cost for labor, supervision, sorting equipment, supplies, and the final report is approximately $70,000, and the cost for laboratory analysis is estimated at approximately $20,000. Total Cost is $90,000. (SCL CAC will fund $70,000 and an additional $20,000 will be funded by a grant from the Patriot Oil Community Benefit Trust Fund). The SCL CAC does not reimburse and does not pay the SCL LEA for the technical oversight and other technical assistance needed in completing this project.

Sunshine Canyon Landfill Waste Composition—Laboratory Sampling Procedure (3/11/15)



APPENDIX B
Waste Classifications/Material Types

Recommended Waste Classifications

Material Group	Material Type
Paper	
1	Uncoated Corrugated Cardboard & Kraft
2	Newspaper
3	Office Paper (Any Color Ledger & CPO)
4	Mixed Recyclable Paper (Envelopes, Magazines, Chipboard Boxes, etc.)
5	Compostable Paper (Napkins, Paper Towels, Tissues)
6	R/C Non-Recyclable Paper (Coated OCC, Laminated Paper, etc.)
Plastic	
7	#1 PET Bottles/Containers
8	#2 HDPE Bottles/Containers
9	Other Plastic Bottles/Containers (#3-#7)
10	Plastic Film/Wrap
11	Plastic Products (Durable Goods)
12	R/C Plastic
Metals	
13	Aluminum Cans
14	Tin/Steel Cans
15	Other Ferrous Metals
16	Other Non-Ferrous Metals
17	R/C Mixed Metals/Other Materials

Material Group	Material Type
Glass	
18	Glass Bottles (Recyclable)
19	Other Glass (Flat, mirrors, window, etc.)
20	R/C Glass and Other Materials
Inorganics	
21	C&D (Bricks, Tiles, etc.)
22	Ceramics
23	Sand / Rocks / Dirt
24	R/C and Other Inorganics
Green Waste	
25	Green/Yard Waste (Leaves/Grass)
26	Branches/Twigs
27	Stumps (> 4" Diameter)
Wood	
28	Untreated/Clean Wood
29	Treated Wood
30	Pallets
Organics	
31	Food
32	Textiles/Leather
33	Rubber
34	Carpet/Padding
35	R/C Miscellaneous Organics

HHW/Special Waste	
36	Pesticides/Herbicides
37	Paints/Adhesives/Solids
38	Household Cleaners
39	Automotive Fluids & Other -Wax, Polish, etc
40	E-Waste Electronics, Computers, CRT, etc.
41	Other HHW/Special Waste
Bulky Items	
42	Household Appliances
43	Furniture/Mattresses
44	Other Bulky Materials
Mixed Residue	
45	Mixed Residue
Problem Materials (Non-Processible)	
46	Hose, Ropes, etc. (Not stretch wrap)
Liquids (Not added in Total Sample Weight)	
47	Liquids

Definitions of Material Types

Material ID & Name		Material Type Definition
PAPER		
1	**Uncoated Corrugated Cardboard AND Paper Bags / Kraft**	**Uncoated Corrugated Cardboard** usually has three layers. The center wavy layer is sandwiched between the two outer layers. It does **not** have any wax coating on the inside or outside. Examples include entire cardboard containers, such as shipping and moving boxes, computer packaging cartons, and sheets and pieces of boxes and cartons. This type does not include chipboard. **Paper Bags** means bags and sheets made from Kraft paper. Examples include paper grocery bags, fast food bags, department store bags, and heavyweight sheets of Kraft packing paper.
2	**Newspaper**	**Newspaper** means paper used in newspapers. Examples include newspaper and glossy inserts, and all items made from newsprint, such as free advertising guides, election guides, plain news packing paper, stapled college schedules of classes, and tax instruction booklets.
3	**Office Paper / White & Color Ledger AND Computer Paper**	**White Ledger** means uncolored bond, rag, or stationary grade paper. It may have colored ink on it. When the paper is torn, the fibers are white. Examples include white photocopy, white laser print, and letter paper. **Colored Ledger** means colored bond, rag, or stationery grade paper. When the paper is torn, the fibers are colored throughout. Examples include colored photocopy and letter paper. This type does not include fluorescent dyed paper or deep-tone dyed paper such as goldenrod colored paper. **Computer Paper** means paper used for computer printouts. This type usually has a strip of form feed holes along two edges. If there are no holes, then the edges show tear marks. This type can be white or striped. Examples include computer paper and printouts from continuous feed printers. This type does not include "white ledger" used in laser or impact printers, nor computer paper containing groundwood.
4	**Mixed Recyclable Paper**	**Other Office Paper** means other kinds of paper used in offices. Examples include manila folders, manila envelopes, index cards, white envelopes, white window envelopes, white or colored notebook paper, carbonless forms, and junk mail. This type does **not** include "white ledger", "colored ledger", or "computer paper". **Magazines and Catalogs** means items made of glossy coated paper. This paper is usually slick, smooth to the touch, and reflects light. Examples include glossy magazines, catalogs, brochures, and pamphlets. **Phone Books and Directories** means thin paper between coated covers. These items are bound along the spine with glue. Examples include whole or damaged telephone books, "yellow pages", real estate listings, and some non-glossy mail order catalogs.
	CONTINUED	**TO NEXT PAGE**

Material ID & Name		Material Type Definition
4	**Other Miscellaneous Paper NOW included with Mixed Recyclable Paper**	**Other Miscellaneous Paper** means items made mostly of paper that do not fit into any of the above types. Paper may be combined with minor amounts of other materials such as wax or glues. This type includes items made of chipboard, groundwood paper, and deep-toned or fluorescent dyed paper. Examples include cereal and cracker boxes, unused paper plates and cups, goldenrod colored paper, school construction paper/butcher paper, milk cartons, ice cream cartons and other frozen food boxes, unopened junk mail, colored envelopes for greeting cards, pulp paper egg cartons, unused pulp paper plant pots, and hardcover and softcover books.
5	**Compostable Paper**	**Compostable Paper** includes Napkins, Paper Towels, & Tissues
6	**Remainder/ Composite Paper Non-Recyclable**	**Remainder/Composite Paper** means items made mostly of paper but combined with large amounts of other materials such as wax, plastic, glues, foil, food, and moisture. Examples include waxed corrugated cardboard, aseptic packages, waxed paper, blueprints, sepia, onion skin, fast food wrappers, carbon paper, self-adhesive notes, and photographs.
PLASTIC		
7	**PETE Bottles AND Containers**	**PETE Bottles** means clear or colored PETE (polyethylene terephthalate) bottles. When marked for identification, it bears the number 1 in the center of the triangular recycling symbol and may also bear the letters PETE or PET. The color is usually clear, transparent green or amber. A PETE bottle usually has a small dot left from the manufacturing process, not a seam. It does not turn white when bent. Examples of narrow and wide neck bottles include: soft drink, water, and liquor bottles, cooking oil, pastry jars, food jars, and aspirin bottles. Containers include black frozen food trays, food and non-food clamshell packaging (#1 NOT PS), bakery packaging with hinged lids, hardware and fastener packaging.
8	**HDPE Bottles AND Containers & 5-gal Buckets**	**HDPE Natural Bottles** means natural HDPE (high-density polyethylene) bottles. This plastic is cloudy white, allowing light to pass through it. When marked for identification, it bears the number 2 in the triangular recycling symbol. Examples include milk jugs, water jugs, and some juice bottles. Colored bottles include detergent bottles, some shampoo and hair-care bottles, empty motor oil, empty antifreeze, and other empty vehicle and equipment fluid bottles, and narrow and wide mouth food containers, such as for coffee and coffee creamer. Include 5-gallon buckets (and other sizes)
9	**#3–#7 Bottles AND Containers**	**#3-#7 Bottles** means plastic bottles made of types of plastic other than HDPE (high-density polyethylene) or PETE (polyethylene terephthalate). Items may be made of PVC (polyvinyl chloride), LDPE (low-density polyethylene), PP (polypropylene), PS (polystyrene), or mixed resins. When marked for identification, these bottles bear the number 3, 4, 5, 6, or 7 in the triangular recycling symbol. Examples include bottles for some salad dressings, vegetable oils, juices, syrup, shampoo, and vitamins. NOTE: Previously called “Miscellaneous Plastic Containers”. PS CLAMSHELLS GO HERE.
	CONTINUED	**TO NEXT PAGE**

Material ID & Name		Material Type Definition
PLASTIC continued		
10	**Plastic Film / Wrap AND Non-Bag Packaging Film**	**Film Products** means plastic film used for purposes other than packaging. Examples include agricultural film (films used in various farming and growing applications, such as silage greenhouse films, mulch films, and wrap for hay bales), plastic sheeting used as drop cloths, and building wrap. Include trash bags, grocery & other retail bags, old category: non-bag commercial & industrial packaging film. Also includes bubble wrap, mailing pouches, zipper-recloseable bags, candy bar wrappers, X-ray film, metallized film (wine containers and balloons), and plastic food wrap. **Plastic Trash Bags** means plastic bags sold for use as trash bags, for both residential and commercial use. Does not include other plastic bags like shopping bags that might have been used to contain trash. **Plastic Grocery And Other Merchandise Bags** means plastic shopping bags used to contain merchandise to transport from the place of purchase, given out by the store with the purchase. Includes dry-cleaning plastic bags intended for 1-time use. **Non-Bag Commercial And Industrial Packaging Film** means film plastic used for large-scale packaging or transport packaging. Examples include shrink-wrap, mattress bags, furniture wrap, and film bubble wrap.
11	**Plastic Products (Durable Items)**	**Durable Plastic Items** means all other plastic objects other than containers, or film plastic. Examples include mop buckets, plastic outdoor furniture, plastic toys, large paint/food buckets, CD's, plastic stay straps, sporting goods, and plastic house wares such as dishes, cups, and cutlery. This type also includes building materials such as house siding, window sashes and frames, housings for electronics (such as computers, televisions and stereos), fan blades, impact-resistance cases (e.g. tool boxes, first aid boxes, tackle boxes, sewing kits, etc.), and plastic pipes and fittings.
12	**Remainder/ Composite Plastic**	**Remainder/Composite Plastic** means plastic that cannot be put in any other type. They are usually recognized by their optical opacity. This type includes items made mostly of plastic but combined with other materials. **Examples include auto parts made of plastic attached to metal, plastic drinking straws, foam drinking cups, produce trays, foam meat and pastry trays, foam packing blocks, packing peanuts, foam plates and bowls, plastic strapping, plastic lids,** some kitchen ware, toys, new plastic laminate (e.g., Formica), vinyl, linoleum, plastic lumber, insulating foams, imitation ceramics, handles and knobs, plastic string (such as is used for hay bales), and **plastic rigid bubble/foil packaging (as for medications).**
	CONTINUED	**TO NEXT PAGE**

METAL		
13	**Aluminum Cans**	**Aluminum Cans** means any food or beverage container made mainly of aluminum. Examples include aluminum soda or beer cans, and some pet food cans. This type does not include bimetal containers with steel sides and aluminum ends.
14	**Tin/Steel Cans**	**Tin/Steel Cans** means rigid containers made mainly of steel. These items will stick to a magnet and may be tin-coated. This type is used to store food, beverages, paint, and a variety of other household and consumer products. Examples include canned food and beverage containers, empty metal paint cans, empty spray paint and other aerosol containers, and bimetal containers with steel sides and aluminum ends.
15	**Other Ferrous**	**Other Ferrous** means any iron or steel that is magnetic or any stainless steel item. This type does not include "tin/steel cans". Examples include structural steel beams, metal clothes hangers, metal pipes, stainless steel cookware, security bars, and scrap ferrous items.
16	**Other Non-Ferrous**	**Other Non-Ferrous** means any metal item, other than aluminum cans, that is not stainless steel and that is not magnetic. These items may be made of aluminum, copper, brass, bronze, lead, zinc, or other metals. Examples include aluminum window frames, aluminum siding, copper wire, shell casings, brass pipe, and aluminum foil.
17	**Remainder/ Composite Mixed Metals / Other Materials**	**Remainder/Composite Metal** means metal that cannot be put in any other type. This type includes items made mostly of metal but combined with other materials and items made of both ferrous metals and non-ferrous metal combined**. Examples include small non-electronic appliances such as toasters and hair dryers, motors, insulated wire,** and finished products that contain a mixture of metals, or metals and other materials, whose weight is derived significantly from the metal portion of its construction.
GLASS		
18	**Glass Bottles (Recyclable)**	**Clear, Green, Brown, Blue Bottles & Containers, CRV & non-CRV**
19	**Other Glass (Flat Glass)**	**Flat Glass** means clear or tinted glass that is flat. Examples include glass windowpanes, doors, and tabletops, flat automotive window glass (side windows), safety glass, and architectural glass. This type does not include windshields, laminated glass, or any curved glass.
20	**Remainder/ Composite Glass And Other Materials**	**Remainder/Composite Glass** means glass that cannot be put in any other type. It includes items made mostly of glass but combined with other materials. **Examples include Pyrex, Corningware, crystal and other glass tableware, mirrors, non-fluorescent light bulbs, and auto windshields.** **Mixed Cullet** means small broken pieces and fragments of mixed container, flat, and tableware glass that cannot effectively be sorted by type or color. May include particles as large as 2 inches, but generally intended to capture material in which 50 percent or more of all particles pass through a half-inch screen. Examples include broken bottles, windshield fragments and glass tableware.

Material ID & Name		Material Type Definition
INORGANICS (aka won't burn or rot)		
21	**C&D**	**Bricks & Tiles. Also use for Concrete, cinder blocks, Asphalt Paving & Roofing, roofing tar/paper etc.**
22	**Ceramics**	**Ceramics non food related; such as toilets and sinks**
23	**Sand / Rocks / Dirt**	**Was Rock, Soil and Fines** means rock pieces of any size and soil, dirt, and other matter. Examples include rock, stones, and sand, clay, soil, and other fines. This type also includes non-hazardous contaminated soil.
24	**Remainder/ Composite Construction and Demolition**	**Remainder/Composite Construction and Demolition** means construction and demolition material that cannot be put in any other type. This type may include items from different categories combined, which would be very hard to separate. Examples include brick, ceramics, tiles, toilets, sinks, dried paint not attached to other materials, and fiberglass insulation. This type may also include demolition debris that is a mixture of items such as plate glass, wood, tiles, gypsum board, and aluminum scrap.
GREEN WASTE		
25	**Green Yard Waste / Leaves and Grass**	**Leaves and Grass** means plant material, except woody material, from any public or private landscapes. Examples include leaves, grass clippings, sea weed, and plants. This type does not include woody material or material from agricultural sources.
26	**Branches / Twigs (formerly called Prunings and Trimmings)**	**Prunings and Trimmings** means woody plant material up to 4 inches in diameter from any public or private landscape. Examples include prunings, shrubs, and small branches with branch diameters that do not exceed 4 inches. This type does not include stumps, tree trunks, or branches exceeding 4 inches in diameter. This type does not include material from agricultural sources.
27	**Branches and Stumps**	**Branches and Stumps** means woody plant material, branches, and stumps that **exceed four inches in diameter** from any public or private landscape.
WOOD		
28	**Untreated / Clean Wood Formerly Lumber (non-treated)**	**Lumber (non-treated)** means non-treated processed wood for building, manufacturing, landscaping, packaging, and non-treated processed wood from demolition. Examples include dimensional lumber, lumber cutoffs, engineered wood such as plywood and particleboard, wood scraps, pallets, wood fencing, wood shake roofing, and wood siding.
Material ID & Name		**Material Type Definition**
29	**Treated Wood Waste**	**Treated Wood Waste** means wood that has been treated with a chemical preservative for purposes of protecting the wood against attacks from insects, microorganisms, fungi, and other environmental conditions that can lead to decay of the wood and the chemical preservative is registered pursuant to the Federal Insecticide, Fungicide, and Rodenticide Act (7 U.S.C. Sec. 136 and following). This includes wood that has been pressure treated, chemically treated (with copper etc.) or treated with creosote (e.g. railroad ties, marine timbers and pilings, landscape timbers, and telephone poles).
30	**Pallets**	**Wood pallets & skids. Also include crates?**

ORGANIC		
31	**Food**	**Food** means food material resulting from the processing, storage, preparation, cooking, handling, or consumption of food. This type includes material from industrial, commercial, or residential sources. Examples include discarded meat scraps, dairy products, egg shells, fruit or vegetable peels, and other food items from homes, stores, and restaurants. This type includes grape pomace and other processed residues or material from canneries, wineries, or other industrial sources.
32	**Textiles / Leather**	**Textiles** means items made of thread, yarn, fabric, or cloth. Examples include clothes, fabric trimmings, draperies, and all natural and synthetic cloth fibers. This type does not include cloth-covered furniture, mattresses, leather shoes, leather bags, or leather belts.
33	**Rubber**	**Rubber bands, hose, latex gloves (not purple ones),**
34	**Carpet / Padding**	**Carpet** means flooring applications consisting of various natural or synthetic fibers bonded to some type of backing material. Does not include carpet padding.
35	**Remainder/ Composite Organics**	**Remainder/Composite Organics** means organic material that cannot be put in any other type or subtype. This type includes items made mostly of organic materials but combined with other materials. Examples include leather items, cork, hemp rope, garden hoses, rubber items, hair, carpet padding, cigarette butts, diapers, feminine hygiene products, wood products (popsicle sticks and toothpicks), sawdust, and animal feces.
HOUSEHOLD HAZARDOUS WASTE / Special Wastes		
36	**Pesticides / Herbicides**	**As described**
37	**Paints / Adhesives / Solids**	**Paint** means containers with paint in them. Examples include latex paint, oil based paint, and tubes of pigment or fine art paint. This type does not include dried paint, empty paint cans, or empty aerosol containers.
38	**Household Cleaners**	**As described (note: unless empty bottle)**
	CONTINUED	**TO NEXT PAGE**
39	**Vehicle and Equipment Fluids**	**Vehicle and Equipment Fluids** means containers with fluids used in vehicles or engines, except used oil. Examples include used antifreeze and brake fluid. This type does not include empty vehicle and equipment fluid containers. WAX, POLISH, ETC **Include: Used Oil** means the same as defined in Health and Safety Code section 25250.1(a). Examples include spent lubricating oil such as crankcase and transmission oil, gear oil, and hydraulic oil.
40	**E-Waste Electronics**	**Televisions and Other Items with CRTs**. Examples include televisions, computer monitors, and other items containing a cathode ray tube (CRT). **Computer-related Electronics** means electronics with large circuitry that is computer-related**.** Examples include processors, mice, keyboards, laptops, disk drives, printers, modems, and fax machines **Other Small Consumer Electronics** means portable non-computer-related electronics with large circuitry. Examples include personal digital assistants (PDAs), cell phones, phone systems, phone answering machines, computer games and other electronic toys, portable CD players, camcorders, and digital cameras.

41	**Other HHW/ Special Waste**	**Include: Batteries** means any type of battery including both dry cell and lead acid. Other HHW: fluorescent light bulbs. Other Special Waste: Ash, Sewage Solids, Industrial sludge, Treated medical waste, **Remainder/Composite Special Waste** means special waste that cannot be put in any other type. Examples include asbestos-containing materials, such as certain types of pipe insulation and floor tiles, auto fluff, auto-bodies, trucks, trailers, truck cabs, untreated medical waste/pills/hypodermic needles, and artificial fireplace logs.
BULKY ITEMS		
42	**Household Appliances**	**Major Appliances** means discarded major appliances of any color. These items are often enamel-coated. Examples include washing machines, clothes dryers, hot water heaters, stoves, and refrigerators. This type does not include electronics, such as televisions and stereos.
43	**Furniture / Mattresses**	**Bulky Items** means large hard to handle items that are not defined separately, including furniture, mattresses, and other large items. Examples include all sizes and types of furniture, mattresses, box springs, and base components.
44	**Other Bulky Materials**	**Tires from vehicles. OTHER** large hard to handle items
MIXED RESIDUE		
45	**Mixed Residue**	**Mixed Residue** means material that cannot be put in any other type in the other categories. This type includes mixed residue that cannot be further sorted. Examples include clumping kitty litter and residual material from a materials recovery facility or other sorting process that cannot be put in any of the previous remainder/composite types.
PROBLEM MATERIALS		
46	**Problem Materials**	Problem Materials (e.g. Hose, Ropes, etc. BUT NOT STRETCH WRAP) **PROVIDE DESCRIPTION**
LIQUIDS		
47	**Liquids**	Not added in Total Sample Weight

APPENDIX C
Health and Safety Guidelines for Waste Characterization Studies

Health and Safety Guidelines for Waste Characterization Studies

1. Introduction

The purpose of this document is to provide safety guidelines for performing visual and/or physical characterizations of nonhazardous solid waste from various selected garbage dumpsters, transfer stations, and sanitary landfills.

2. Table of Contents

3. Specific Procedures

3.01 List of potential hazards

The following section lists some possible hazards that may occur during a visual and a physical sort of solid waste.

1. Physical hazards
    - Cuts and punctures from handling hazardous materials: hypodermic needles, broken glass, razor blades, aerosol cans, chemicals, biohazards, bottles of unknown/unlabeled substances, plastic bottles containing used syringes, and other hazardous materials
    - Back injury
    - Slipping and falling
    - Heat stress and fatigue
    - Traffic or heavy equipment movement
    - Noise exposure from operation of heavy equipment
    - Animal and/or insect bites
2. Airborne contaminants
    - Dust from solid waste
3. Chemical hazards

- Liquid spills from containers
- Household and hazardous chemicals

4. Biological hazards
    - Household hazardous wastes
    - Medical wastes and sharps
    - Bloody rags or objects
    - Hypodermic needles
    - Diapers / Feminine hygiene and sanitary products

3.02 Recommended personal safety/protective equipment

The following section lists some of the personal safety/protective equipment recommended for a visual and physical sort of solid waste.

1. Body protection
    - Tyvek or equivalent, disposable coveralls
    - Chemical resistant coveralls, if appropriate
    - Hard bottomed, nonslip, steel toe boots
    - A supply of outer rubber (cut and puncture resistant) gloves
    - Chemical goggles or safety glasses with splash shields
    - Dust masks
    - A supply of inner (latex) gloves
    - Snake guards, if appropriate
    - Insect repellent
    - Dog repellent (bear repellent if in areas with bears)

2. Hearing protection (if site has equipment or activities that generate loud noises)
    - Ear plugs
    - Ear muffs

3. Other safety equipment
    - Supportive back belt for heavy lifting
    - Industrial first aid kit
    - Field blanket
    - Eye wash kit
    - Moist, disposable towelettes (e.g., baby wipes)
    - Six foot pole
    - Small fire extinguisher
    - Portable telephone
    - High visibility traffic cones and tapes
    - Site-specific safety plan
    - Liquids to replenish fluids (water and cups for dehydration)

3.03 Responsible personnel

The following section lists some of the duties and responsibilities of personnel who are supervising and conducting a visual/physical sort of solid waste.

1. Supervising Project Manager's duties and responsibilities:
    - Delegate health and safety responsibilities to the Site Safety Officer; ensure that qualified personnel implement proper procedures in a safe manner, make available proper personal protective equipment, adequate time, and budget.

    - Ensure that all field personnel have read, understood, and signed the master copy of this document.

    - Check that all the site personnel have received, and documented training on waste characterization methods, recognizing hazardous wastes, potential risks from handling hazardous materials, managing site traffic, controlling dust/airborne contaminants, and back injury prevention.

2. Site Safety Officer's (can be the same person as above) duties and responsibilities:
    - Has the duty and authority to stop unsafe operations, supervise CPR, and decide when to summon emergency services.

    - Ensure that the guidelines, rules, and procedures in this document are followed for all site work.

    - Be familiar with local emergency services, and maintain a list of emergency phone numbers. Provide a map with the quickest route to a medical facility.

    - Conduct daily tailgate health and safety meetings before each shift, and a daily summary meeting at the end of each shift to discuss the day's safety issues, possible solutions, and notify personnel of all changes associated with health, safety, and protocol.

    - Maintain and inspect personal protective equipment. Ensure proper use of personal protective equipment by all employees.

    - Monitor on site hazards and the early health warning signs (e.g., heat stress/stroke, dehydration, or fatigue) of site personnel. It is recommended that on hot days, outdoor sampling should be done during the early hours.

- Has completed appropriate health and safety training. (Recommended: 40-hour Hazardous Waste Operation & Emergency Response, CCR, T8, Section 5192-OSHA).

3.04 General safety procedures

The following section lists some of the general safety procedures recommended for a visual/physical sort of solid waste.

1. All waste sorting personnel should: be in good physical condition, have had a recent medical exam, maintain a current tetanus booster and Hepatitis B shot, not be sensitive to odors and dust, and be able to read warning signs/labels on waste containers.

2. There will be absolutely no eating, smoking, or drinking during sorting activities. Food and liquids are to be away from the sorting area. Plenty of fluids (e.g., water, sports drinks, etc.) and single use, disposable cups must be available at all times. Hands and faces should be washed before eating or drinking. Consume drinks and rest frequently during hot days.

3. The "line of sight buddy system" must always be maintained at the sorting site. The "line of sight buddy system" is as follows: sorters are grouped into pairs and each member is to periodically assess the physical condition of his/her "buddy".

4. Always wear the following before beginning the sorting procedure: both pairs of gloves (outer rubber and inner latex), chemical goggles or safety glasses with splash shields, a dust mask, and disposable Tyvek overalls. Use safety boots especially when getting into bins.

5. Make noise when approaching the actual waste site to allow any wildlife/pest animals to flee. Look for snakes and poisonous spiders around and inside a dumpster/bin by probing with a long stick.

6. Do not attempt to identify unknown chemical substances present in the waste stream: vials of chemicals, unlabeled pesticide/herbicide containers, and substances (e.g., chemicals, or needles) in unlabeled plastic/glass bottles/jugs.

7. Household hazardous wastes are those wastes resulting from products purchased by the public for household use which because of their quantity, concentration, physical, or infectious, characteristics, may pose a substantial known or potential hazard to human or environmental health when improperly disposed. Empty containers of household hazardous wastes are generally not

considered to be a hazardous waste. If hazardous wastes are detected, the Site Safety Officer will be notified.

8. Hazardous materials and hazardous wastes should not be present in non-residential sources of municipal solid waste. If hazardous wastes are present in the municipal waste stream, from a commercial or industrial source, the material is not a household hazardous waste, it is a hazardous waste and the Site Safety Officer must be notified.

9. Bio-hazardous wastes are generally disposed of in red, plastic bags. Treated bio-hazardous wastes (by incineration, autoclave, chemical sterilization, etc.), are also usually in red bags. If biohazardous wastes are detected, the sort will be halted (the bag will not be removed from the dumpster/bin) and the Site Safety Officer must be notified.

10. A potential hazard that can arise in waste sampling is the presence of bio-hazardous wastes that are not in red bags, referred to as "fugitive regulated wastes". Sorters must be on alert for the indicators of fugitive bio-hazardous wastes: hypodermic needles, needle covers, medical tubing, articles contaminated with red (blood) colored substances, and medical device packaging. If fugitive bio-hazardous wastes are detected, the sort will be halted and the Site Safety Officer notified.

11. When sorting glass, remove the large pieces first, and then remove the clear glass. Never use your hands to dig down through the waste. Use a rake or small shovel to pull/push the material to the side and continue sorting.

12. At the end of each shift, remove all disposable clothing into a plastic trash bag, and place the bag into a solid waste receptacle. All sorters must shower at the end of each shift.

3.05 Site control in work zones

The following section lists site control recommendations for a visual/physical sort of solid waste.

1. Traffic cones or high visibility warning tape will be placed around the active sorting area.

2. Each work crew will keep a site-specific safety plan on site at all times.

3.06 Site resources and personnel

The following section lists available site contacts and resources for a visual/physical sort of solid waste.

a. On-site contact:
- Main point of contact
- Telephone number
- Facility manager
- Telephone number

b. Site resources locations
- Toilet facilities
- Drinking water
- Telephone

c. Medical information
- Local emergency medical facility
- Fire Dept. phone number
- Police Dept. phone number
- Local ambulance phone number

3.07 Site maps
See attachments for a site map that shows the location of local medical facilities.

3.08 Agreement to comply with the health and safety plan

I _____ (print name) have read and understand the health and safety plan and will follow the procedures and protocols detailed in the plan for waste characterization at all designated sites.

APPENDIX D
Laboratory Test Reports, Material Type Sorting and Sizing Results

Table A

Woods End Laboratories – Biological Methane Potential Results

Biogas Analysis

Sample ID: Feedstock: Mixed Waste: Resident. A

VARIABLE MEASURED	Unit	Results	Rank
Total Solids	percent	32.3	
Total Solids per Test Flask	grams	3.7	
Cumulative biogas per fresh weight	$m^3 Mg^{-1}$ FW	107	
Cumulative methane per fresh weight	$m^3 Mg^{-1}$ FW	57	
Cumulative methane per volatile solids	$m^3 Mg^{-1}$ VS	217	
Cumulative biogas per fresh weight	$ft^3 ton^{-1}$ FW	3440	
Cumulative methane per fresh weight	$ft^3 ton^{-1}$ FW	1816	
Cumulative methane per volatile solids	$ft^3 ton^{-1}$ VS	6966	
Cumulative methane	percent of total biogas	53	
Biogas carbon evolution	percent of initial carbon	41	
Heat Value of biogas	BTU ton^{-1} FW	1,837,587	

Notes:

Mg metric ton (1000 kg)
FW fresh weight (as is)
VS Volatile Solids
m3 cubic meter volume
ft3 cubic foot volume
BTU British Thermal Unit

Interpretation:

m3 Mg-1 FW = cubic meters per metric ton of fresh weight
ft3 ton-1 VS = cubic feet per english ton of volatile solids
Biogas carbon evolution:
- Amount of total-C in sample converted to biogas, as %

Ranking: Based on Standard Values Table, German Biogass Assoc.
Rank AVG =normal, **L** =lower than normal, **ML** =slightly low, **MH** =higher than normal, **H** =high

Biogas Graphical Results

Sample ID: Feedstock: Mixed Waste: Resident. A

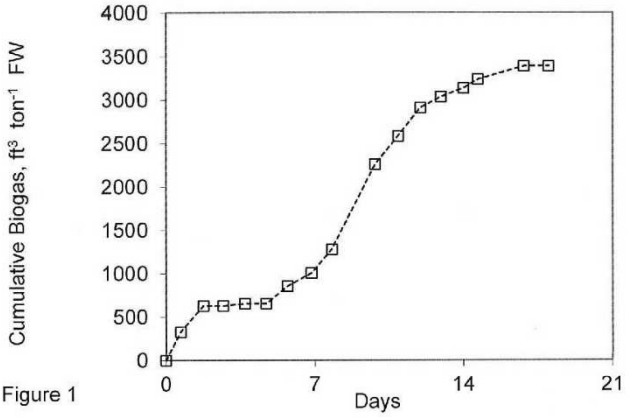


Figure 1

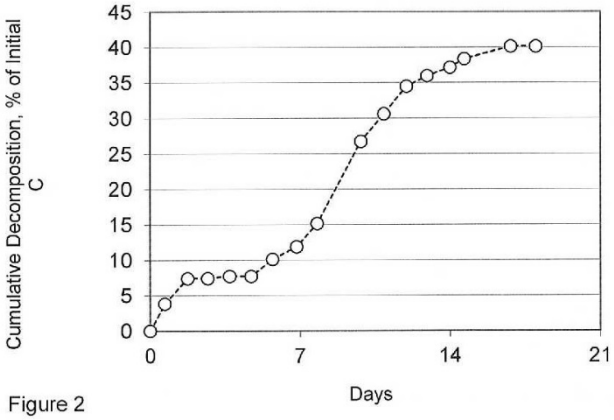


Figure 2

Biogas Analysis

Sample ID: Feedstock: Mixed Waste: Resident. B

VARIABLE MEASURED	Unit	Results	Rank
Total Solids	percent	25.8	
Total Solids per Test Flask	grams	3.4	
Cumulative biogas per fresh weight	$m^3 Mg^{-1}$ FW	104	
Cumulative methane per fresh weight	$m^3 Mg^{-1}$ FW	57	
Cumulative methane per volatile solids	$m^3 Mg^{-1}$ VS	247	
Cumulative biogas per fresh weight	$ft^3 ton^{-1}$ FW	3331	
Cumulative methane per fresh weight	$ft^3 ton^{-1}$ FW	1820	
Cumulative methane per volatile solids	$ft^3 ton^{-1}$ VS	7898	
Cumulative methane	percent of total biogas	55	
Biogas carbon evolution	percent of initial carbon	45	
Heat Value of biogas	BTU ton^{-1} FW	1,841,388	

Notes:

Mg metric ton (1000 kg)
FW fresh weight (as is)
VS Volatile Solids
m3 cubic meter volume
ft3 cubic foot volume
BTU British Thermal Unit

Interpretation:

m3 Mg-1 FW = cubic meters per metric ton of fresh weight
ft3 ton-1 VS = cubic feet per english ton of volatile solids
Biogas carbon evolution:
- Amount of total-C in sample converted to biogas, as %

Ranking: Based on Standard Values Table, German Biogass Assoc.
Rank **AVG** =normal, **L** =lower than normal, **ML** =slightly low, **MH** =higher than normal, **H** =high

Biogas Graphical Results

Sample ID: Feedstock: Mixed Waste: Resident. B

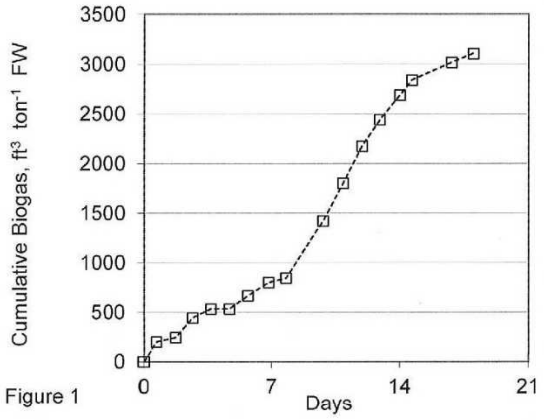


Figure 1

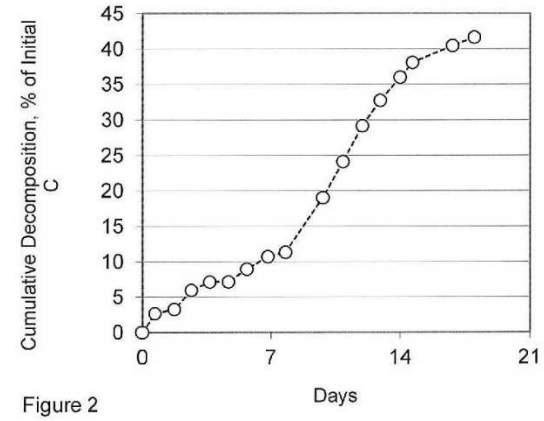


Figure 2

Biogas Analysis

Sample ID: Feedstock: Mixed Waste: Commer. A

VARIABLE MEASURED	Unit	Results	Rank
Total Solids	percent	92.7	
Total Solids per Test Flask	grams	3.2	
Cumulative biogas per fresh weight	$m^3 Mg^{-1}$ FW	430	
Cumulative methane est. / fresh weight	$m^3 Mg^{-1}$ FW	225	
Cumulative methane est. / per VS	$m^3 Mg^{-1}$ VS	257	
Cumulative biogas per fresh weight	$ft^3 ton^{-1}$ FW	13761	
Cumulative methane est. / fresh weight	$ft^3 ton^{-1}$ FW	7219	
Cumulative methane per volatile solids	$ft^3 ton^{-1}$ VS	8232	
Cumulative methane	percent of total biogas	52	
Biogas carbon evolution	percent of initial carbon	48	
Heat Value of biogas	BTU ton^{-1} FW	7,305,328	

Notes:

Mg metric ton (1000 kg)
FW fresh weight (as is)
VS Volatile Solids
m3 cubic meter volume
ft3 cubic foot volume
BTU British Thermal Unit

Interpretation:

m3 Mg-1 FW = cubic meters per metric ton of fresh weight
ft3 ton-1 VS = cubic feet per english ton of volatile solids
Biogas carbon evolution:
- Amount of total-C in sample converted to biogas, as %

Ranking: Based on Standard Values Table, German Biogass Assoc.
Rank **AVG** =normal, **L** =lower than normal, **ML** =slightly low, **MH** =higher than normal, **H** =high

Biogas Graphical Results

Sample ID: Feedstock: Mixed Waste: Commer. A

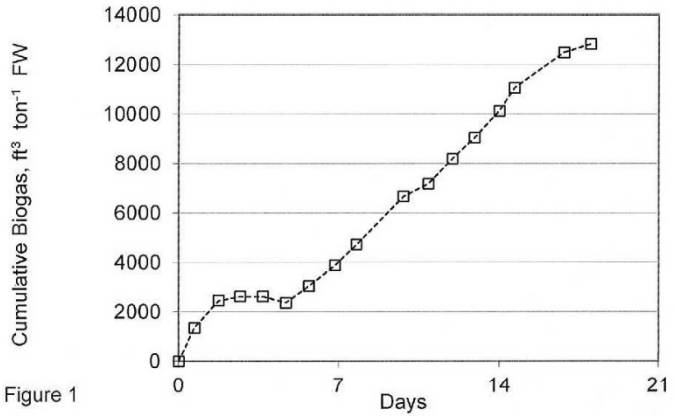


Figure 1

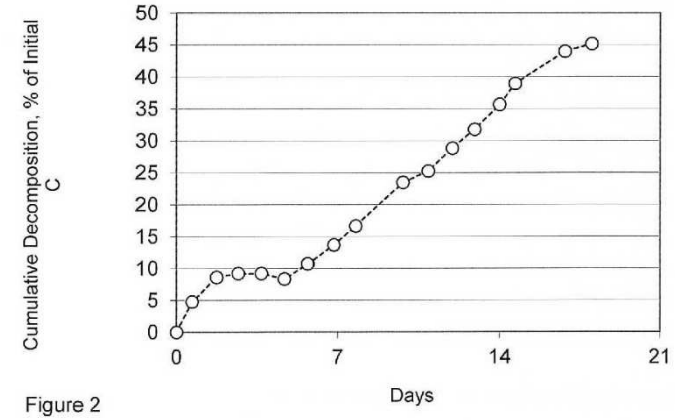


Figure 2

Biogas Analysis

Sample ID: Feedstock:Mixed Waste: Commer. B

VARIABLE MEASURED	Unit	Results	Rank
Total Solids	percent	22.4	
Total Solids per Test Flask	grams	3.3	
Cumulative biogas per fresh weight	$m^3\ Mg^{-1}$ FW	99	
Cumulative methane per fresh weight	$m^3\ Mg^{-1}$ FW	52	
Cumulative methane per volatile solids	$m^3\ Mg^{-1}$ VS	256	
Cumulative biogas per fresh weight	$ft^3\ ton^{-1}$ FW	3180	
Cumulative methane per fresh weight	$ft^3\ ton^{-1}$ FW	1668	
Cumulative methane per volatile solids	$ft^3\ ton^{-1}$ VS	8210	
Cumulative methane	percent of total biogas	52	
Biogas carbon evolution	percent of initial carbon	48	
Heat Value of biogas	BTU ton^{-1} FW	1,688,123	

Notes:

Mg metric ton (1000 kg)
FW fresh weight (as is)
VS Volatile Solids
m3 cubic meter volume
ft3 cubic foot volume
BTU British Thermal Unit
Rank **AVG** =normal, **L** =lower than normal, **ML** =slightly low, **MH** =higher than normal, **H** =high

Interpretation:

m3 Mg-1 FW = cubic meters per metric ton of fresh weight
ft3 ton-1 VS = cubic feet per english ton of volatile solids
Biogas carbon evolution:
- Amount of total-C in sample converted to biogas, as %

Ranking: Based on Standard Values Table, German Biogass Assoc.

Biogas Graphical Results

Sample ID: Feedstock:Mixed Waste: Commer. B

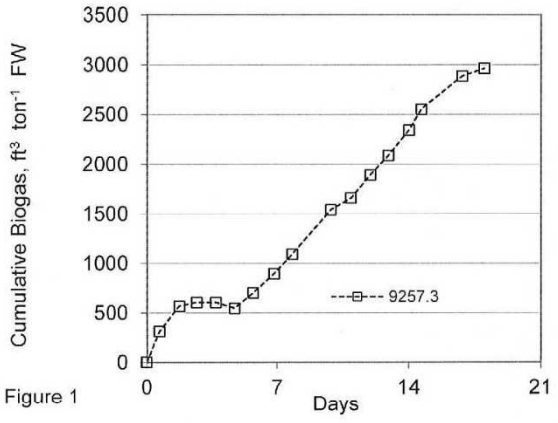


Figure 1

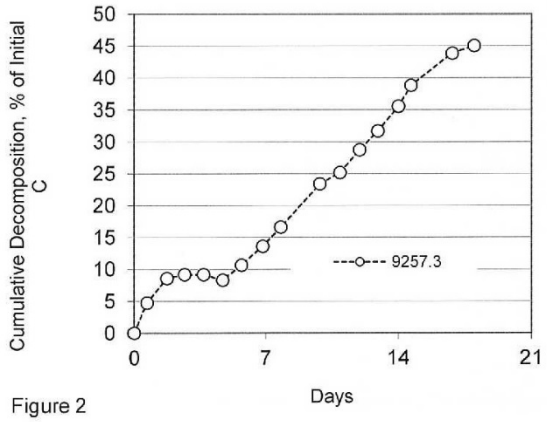


Figure 2

Biogas Analysis

Sample ID: Feedstock: Rolloff, Compactor A

VARIABLE MEASURED	Unit	Results	Rank
Total Solids	percent	23.5	
Total Solids per Test Flask	grams	3.1	
Cumulative biogas per fresh weight	$m^3\ Mg^{-1}$ FW	795	VH
Cumulative methane per fresh weight	$m^3\ Mg^{-1}$ FW	338	
Cumulative methane per volatile solids	$m^3\ Mg^{-1}$ VS	1510	
Cumulative biogas per fresh weight	$ft^3\ ton^{-1}$ FW	25468	
Cumulative methane per fresh weight	$ft^3\ ton^{-1}$ FW	10831	
Cumulative methane per volatile solids	$ft^3\ ton^{-1}$ VS	48363	
Cumulative methane	percent of total biogas	43	
Biogas carbon evolution	percent of initial carbon	351	
Heat Value of biogas	BTU ton^{-1} FW	10,961,103	

Notes:

Mg metric ton (1000 kg)
FW fresh weight (as is)
VS Volatile Solids
m3 cubic meter volume
ft3 cubic foot volume
BTU British Thermal Unit

Interpretation:

m3 Mg-1 FW = cubic meters per metric ton of fresh weight
ft3 ton-1 VS = cubic feet per english ton of volatile solids
Biogas carbon evolution:
- Amount of total-C in sample converted to biogas, as %

Ranking: Based on Standard Values Table, German Biogass Assoc.
Rank **AVG** =normal, **L** =lower than normal, **ML** =slightly low, **MH** =higher than normal, **H** =high

Biogas Graphical Results

Sample ID: Feedstock: Rolloff, Compactor A

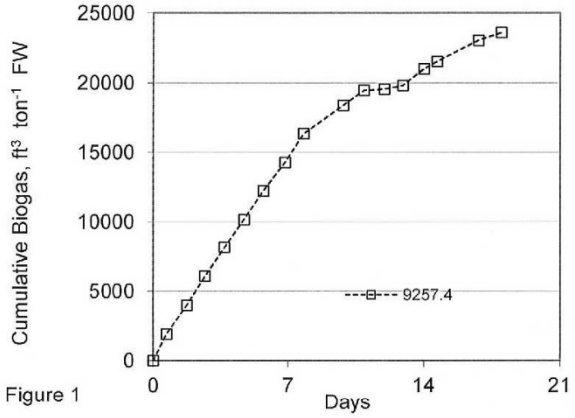


Figure 1

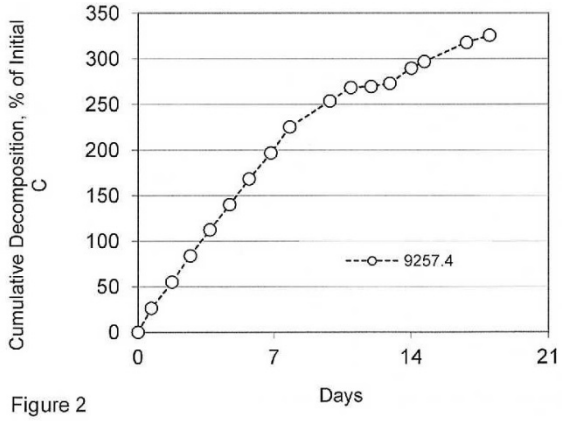


Figure 2

Biogas Analysis

Sample ID: Feedstock: Rolloff, Compactor B

VARIABLE MEASURED	Unit	Results	Rank
Total Solids	percent	45.9	
Total Solids per Test Flask	grams	3.3	
Cumulative biogas per fresh weight	$m^3\ Mg^{-1}$ FW	1130	VH
Cumulative methane per fresh weight	$m^3\ Mg^{-1}$ FW	500	
Cumulative methane per volatile solids	$m^3\ Mg^{-1}$ VS	1207	
Cumulative biogas per fresh weight	$ft^3\ ton^{-1}$ FW	36200	
Cumulative methane per fresh weight	$ft^3\ ton^{-1}$ FW	16021	
Cumulative methane per volatile solids	$ft^3\ ton^{-1}$ VS	38654	
Cumulative methane	percent of total biogas	44	
Biogas carbon evolution	percent of initial carbon	270	
Heat Value of biogas	BTU ton^{-1} FW	16,213,337	

Notes:

Mg metric ton (1000 kg)
FW fresh weight (as is)
VS Volatile Solids
m3 cubic meter volume
ft3 cubic foot volume
BTU British Thermal Unit

Interpretation:

m3 Mg-1 FW = cubic meters per metric ton of fresh weight
ft3 ton-1 VS = cubic feet per english ton of volatile solids
Biogas carbon evolution:
- Amount of total-C in sample converted to biogas, as %

Ranking: Based on Standard Values Table, German Biogass Assoc.
Rank AVG =normal, **L** =lower than normal, **ML** =slightly low, **MH** =higher than normal, **H** =high

Biogas Graphical Results

Sample ID: Feedstock: Rolloff, Compactor B

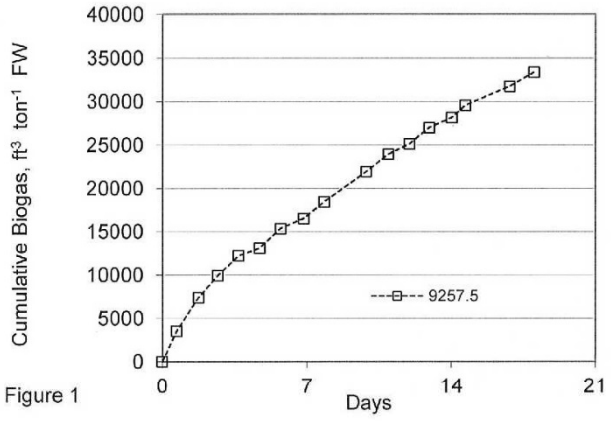


Figure 1

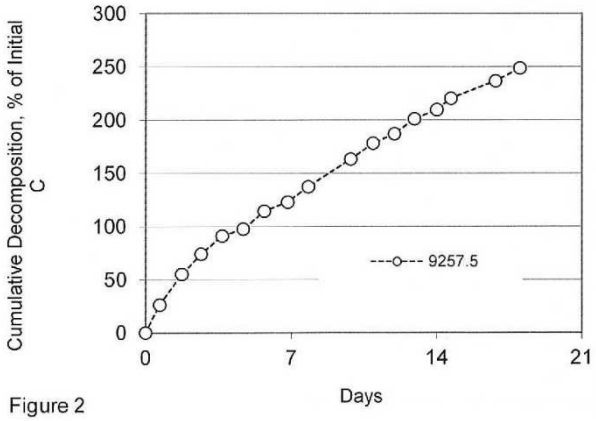


Figure 2

Biogas Analysis

Sample ID: Feedstock: Self Haul A

VARIABLE MEASURED	Unit	Results	Rank
Total Solids	percent	84.3	
Total Solids per Test Flask	grams	6.2	
Cumulative biogas per fresh weight	$m^3\ Mg^{-1}$ FW	646	H
Cumulative methane per fresh weight	$m^3\ Mg^{-1}$ FW	264	
Cumulative methane per volatile solids	$m^3\ Mg^{-1}$ VS	639	
Cumulative biogas per fresh weight	$ft^3\ ton^{-1}$ FW	20685	
Cumulative methane per fresh weight	$ft^3\ ton^{-1}$ FW	8442	
Cumulative methane per volatile solids	$ft^3\ ton^{-1}$ VS	20478	
Cumulative methane	percent of total biogas	41	
Biogas carbon evolution	percent of initial carbon	155	
Heat Value of biogas	BTU ton^{-1} FW	8,542,954	

Notes:

Mg metric ton (1000 kg)
FW fresh weight (as is)
VS Volatile Solids
m3 cubic meter volume
ft3 cubic foot volume
BTU British Thermal Unit

Interpretation:

m3 Mg-1 FW = cubic meters per metric ton of fresh weight
ft3 ton-1 VS = cubic feet per english ton of volatile solids
Biogas carbon evolution:
- Amount of total-C in sample converted to biogas, as %

Ranking: Based on Standard Values Table, German Biogass Assoc.
Rank AVG =normal, **L** =lower than normal, **ML** =slightly low, **MH** =higher than normal, **H** =high

Biogas Graphical Results

Sample ID: Feedstock: Self Haul A

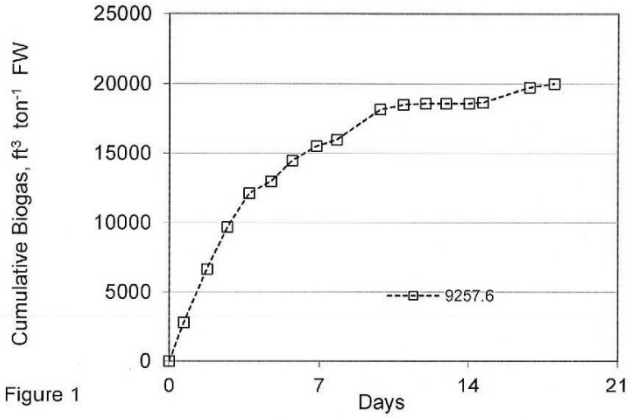


Figure 1

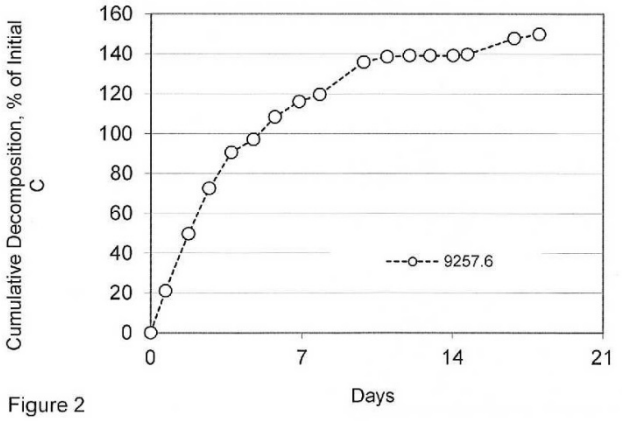


Figure 2

Biogas Analysis

Sample ID: Feedstock: Self Haul B

VARIABLE MEASURED	Unit	Results	Rank
Total Solids	percent	84.5	
Total Solids per Test Flask	grams	12.6	
Cumulative biogas per fresh weight	$m^3 Mg^{-1}$ FW	591	H
Cumulative methane per fresh weight	$m^3 Mg^{-1}$ FW	221	
Cumulative methane per volatile solids	$m^3 Mg^{-1}$ VS	1101	
Cumulative biogas per fresh weight	$ft^3 ton^{-1}$ FW	18932	
Cumulative methane per fresh weight	$ft^3 ton^{-1}$ FW	7094	
Cumulative methane per volatile solids	$ft^3 ton^{-1}$ VS	35273	
Cumulative methane	percent of total biogas	37	
Biogas carbon evolution	percent of initial carbon	291	
Heat Value of biogas	BTU ton^{-1} FW	7,178,834	

Notes:

Mg metric ton (1000 kg)
FW fresh weight (as is)
VS Volatile Solids
m3 cubic meter volume
ft3 cubic foot volume
BTU British Thermal Unit

Interpretation:

m3 Mg-1 FW = cubic meters per metric ton of fresh weight
ft3 ton-1 VS = cubic feet per english ton of volatile solids
Biogas carbon evolution:
- Amount of total-C in sample converted to biogas, as %

Ranking: Based on Standard Values Table, German Biogass Assoc.
Rank **AVG** =normal, **L** =lower than normal, **ML** =slightly low, **MH** =higher than normal, **H** =high

Biogas Graphical Results

Sample ID: Feedstock: Self Haul B

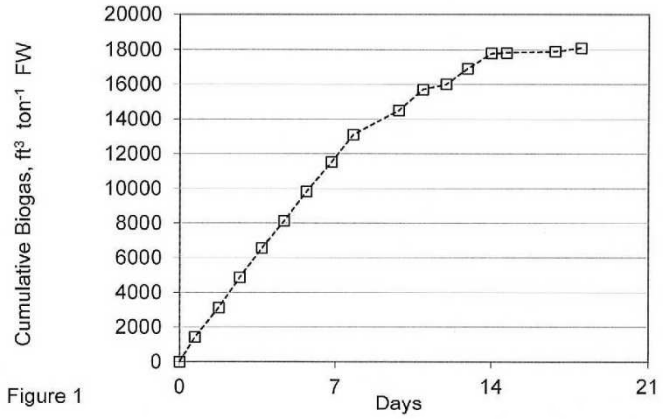


Figure 1

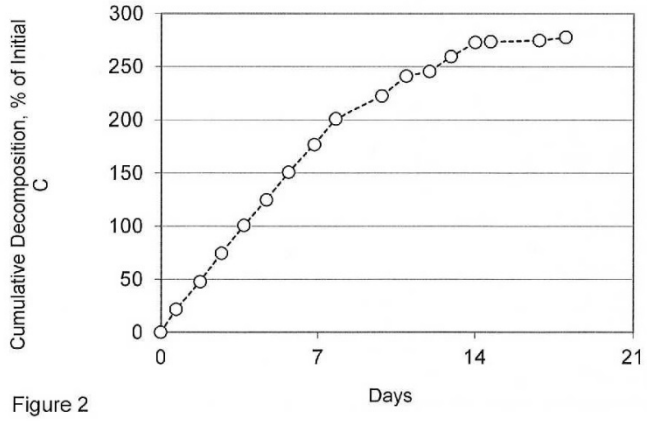


Figure 2

COMPOSITION ANALYSIS

Sample Identification: Feedstock: Mixed Waste: Residential

VARIABLE MEASURED	Unit	dry basis	as is basis	Notations †
Total Solids (dry matter)	%	100.0	32.3	646 lbs/ton
Moisture Content	%	0.0	67.7	162 gals/ton
Water Holding Capacity (*calc*)	%	247	71	171 gals/ton
Inert and Oversize Particles	%	~	5.6	112.0 lbs/ton
Total Organic Matter	%	80.7	26.1	521 lbs/ton

Notes: percent x 10,000 = ppm; ppm = mg/kg; < = less than the MLD (minimum level of detection); nd = none detected

COMPOSITION ANALYSIS

Sample Identification: Feedstock: Mixed Waste: Residential B

VARIABLE MEASURED	Unit	dry basis	as is basis	Notations †
Total Solids (dry matter)	%	100.0	25.8	516 lbs/ton
Moisture Content	%	0.0	74.2	178 gals/ton
Water Holding Capacity (*calc*)	%	271	73	175 gals/ton
Inert and Oversize Particles	%	~	17.9	357.6 lbs/ton
Total Organic Matter	%	89.3	23.0	461 lbs/ton

Notes: percent x 10,000 = ppm; ppm = mg/kg; < = less than the MLD (minimum level of detection); nd = none detected

COMPOSITION ANALYSIS

Sample Identification: Feedstock: Mixed Waste: Commercial A

VARIABLE MEASURED	Unit	dry basis	as is basis	Notations †
Total Solids (dry matter)	%	100.0	92.7	1854 lbs/ton
Moisture Content	%	0.0	7.3	18 gals/ton
Water Holding Capacity (*calc*)	%	285	74	178 gals/ton
Inert and Oversize Particles	%	~	21.8	435.2 lbs/ton
Total Organic Matter	%	94.6	87.6	1753 lbs/ton

Notes: percent x 10,000 = ppm; ppm = mg/kg; < = less than the MLD (minimum level of detection); nd = none detected

COMPOSITION ANALYSIS

Sample Identification: Feedstock: Mixed Waste: Commercial B

VARIABLE MEASURED	Unit	dry basis	as is basis	Notations †
Total Solids (dry matter)	%	100.0	22.4	448 lbs/ton
Moisture Content	%	0.0	77.6	186 gals/ton
Water Holding Capacity (*calc*)	%	274	73	176 gals/ton
Inert and Oversize Particles	%	~	12.9	258.0 lbs/ton
Total Organic Matter	%	90.7	20.3	406 lbs/ton

Notes: percent x 10,000 = ppm; ppm = mg/kg; < = less than the MLD (minimum level of detection); nd = none detected

COMPOSITION ANALYSIS

Sample Identification: Feedstock: Rolloff, Compacter A

VARIABLE MEASURED	Unit	dry basis	as is basis	Notations †
Total Solids (dry matter)	%	100.0	23.5	470 lbs/ton
Moisture Content	%	0.0	76.5	183 gals/ton
Water Holding Capacity (*calc*)	%	287	74	178 gals/ton
Inert and Oversize Particles	%	~	24.4	488.0 lbs/ton
Total Organic Matter	%	95.3	22.4	448 lbs/ton

Notes: percent x 10,000 = ppm; ppm = mg/kg; < = less than the MLD (minimum level of detection); nd = none detected

COMPOSITION ANALYSIS

Sample Identification: Feedstock: Rolloff, Compacter B

VARIABLE MEASURED	Unit	dry basis	as is basis	Notations †
Total Solids (dry matter)	%	100.0	45.9	918 lbs/ton
Moisture Content	%	0.0	54.1	130 gals/ton
Water Holding Capacity (*calc*)	%	273	73	176 gals/ton
Inert and Oversize Particles	%	~	68.3	1366.0 lbs/ton
Total Organic Matter	%	90.3	41.5	829 lbs/ton

Notes: percent x 10,000 = ppm; ppm = mg/kg; < = less than the MLD (minimum level of detection); nd = none detected

COMPOSITION ANALYSIS

Sample Identification: Feedstock: Self Haul A

VARIABLE MEASURED	Unit	dry basis	as is basis	Notations †
Total Solids (dry matter)	%	100.0	84.3	1686 lbs/ton
Moisture Content	%	0.0	15.7	38 gals/ton
Water Holding Capacity (*calc*)	%	160	61	147 gals/ton
Inert and Oversize Particles	%	~	100.0	2000.0 lbs/ton
Total Organic Matter	%	49.0	41.3	826 lbs/ton

Notes: percent x 10,000 = ppm; ppm = mg/kg; < = less than the MLD (minimum level of detection); nd = none detected

COMPOSITION ANALYSIS

Sample Identification: Feedstock: Self Haul B

VARIABLE MEASURED	Unit	dry basis	as is basis	Notations †
Total Solids (dry matter)	%	100.0	84.5	1690 lbs/ton
Moisture Content	%	0.0	15.5	37 gals/ton
Water Holding Capacity (*calc*)	%	90	47	114 gals/ton
Inert and Oversize Particles	%	~	100.0	2000.0 lbs/ton
Total Organic Matter	%	23.8	20.1	402 lbs/ton

Notes: percent x 10,000 = ppm; ppm = mg/kg; < = less than the MLD (minimum level of detection); nd = none detected

Table B

ALS Environmental – Ultimate, Proximate, and Heating Value (BTU) Analysis Results

Certificate of Analysis

Sample ID:	Sample Date & Time		Lab #:	Moisture, Total	Volatile Matter		Fixed Carbon		Ash	
					D7582 Proximate by Automated TGA System					
				wt%	As Received wt%	Moist. Free wt%	As Received wt%	Moist. Free wt%	As Received wt%	Moist. Free wt%
1. Carboard & Kraft	2/24/15	n/a	T1500336-001	26.99	58.78	80.51	9.23	12.64	4.99	6.83
2. Newspaper	2/24/15	n/a	T1500336-002	24.09	53.28	70.19	8.00	10.54	14.63	19.27
3. Office Paper	2/24/15	n/a	T1500336-003	17.24	66.25	80.05	7.78	9.40	8.72	10.54
4. Mixed Paper	2/24/15	n/a	T1500336-004	28.10	54.87	76.31	8.12	11.29	8.92	12.41
5. Compostable Paper	2/24/15	n/a	T1500336-005	48.58	44.34	86.23	5.39	10.48	1.69	3.29
6. R/C Paper	2/24/15	n/a	T1500336-006	31.36	57.79	84.19	7.19	10.47	3.65	5.32
7. PET Bottles/Containers	2/24/15	n/a	T1500336-007	2.76	86.74	89.20	9.71	9.99	0.79	0.81
8. HDPE Bottles/Containers	2/24/15	n/a	T1500336-008	3.44	95.84	99.25	0.07	0.07	0.66	0.68
9. Other Bottles/Containers	2/24/15	n/a	T1500336-009	6.03	91.73	97.62	0.76	0.81	1.48	1.57
10. Plastic Film/Wrap	2/24/15	n/a	T1500336-010	15.92	78.56	93.43	0.48	0.57	5.04	5.99
11. Plastic Products	2/24/15	n/a	T1500336-011	0.41	87.99	88.35	7.63	7.66	3.97	3.99
12. R/C Plastics	2/24/15	n/a	T1500336-012	3.74	90.17	93.67	1.61	1.67	4.48	4.65
25. Green/Yard Waste	2/24/15	n/a	T1500336-013	58.32	31.49	75.55	1.29	3.10	8.90	21.35
26/27. Branches/Twigs/Stumps	2/24/15	n/a	T1500336-014	24.16	59.17	78.02	12.79	16.86	3.88	5.12
28. Untreated/Clean Wood	2/24/15	n/a	T1500336-015	11.28	67.76	76.38	15.53	17.50	5.42	6.11

Certificate of Analysis

Sample ID:	Sample Date & Time		Lab #:	Moisture, Total	Volatile Matter		Fixed Carbon		Ash	
				D7582 Proximate by Automated TGA System						
				wt%	As Received wt%	Moist. Free wt%	As Received wt%	Moist. Free wt%	As Received wt%	Moist. Free wt%
31. Food	2/24/15	n/a	T1500336-016	73.73	21.20	80.72	2.03	7.74	3.03	11.54
32. Textiles & Leathers	2/24/15	n/a	T1500336-017	13.41	67.93	78.45	8.02	9.26	10.64	12.29
33. Rubber	2/24/15	n/a	T1500336-018	16.48	68.34	81.82	0.18	0.22	15.00	17.96
34. Carpet/Padding	2/24/15	n/a	T1500336-019	3.62	80.16	83.17	11.04	11.45	5.18	5.37
35. R/C Misc. Organics	2/24/15	n/a	T1500336-020	67.31	16.45	50.32	0.01	0.02	16.23	49.66
45. Mixed Residue	2/24/15	n/a	T1500336-021	34.93	26.55	40.80	<0.01	<0.01	39.30	60.40

Certificate of Analysis

Sample ID:	Sample Date & Time:	Lab #:	Carbon	Hydrogen	Nitrogen	Oxygen	Sulfur		
				D5373		Calculated	D4239		
			Moist. Free wt%	Moist. Free wt%	Moist. Free wt%	Moist. Free wt%	Moist. Free wt%		
1. Carboard & Kraft	2/24/15 n/a	T1500336-001	44.81	5.66	0.30	42.25	0.146		
2. Newspaper	2/24/15 n/a	T1500336-002	38.88	4.99	0.19	36.62	0.043		
3. Office Paper	2/24/15 n/a	T1500336-003	44.18	5.99	0.16	39.08	0.048		
4. Mixed Paper	2/24/15 n/a	T1500336-004	40.71	5.06	0.31	41.39	0.125		
5. Compostable Paper	2/24/15 n/a	T1500336-005	47.96	5.89	0.45	42.34	0.075		
6. R/C Paper	2/24/15 n/a	T1500336-006	47.56	6.11	0.44	40.46	0.121		
7. PET Bottles/Containers	2/24/15 n/a	T1500336-007	63.18	5.10	0.05	30.82	0.036		
8. HDPE Bottles/Containers	2/24/15 n/a	T1500336-008	81.35	12.80	<0.05	5.16	0.011		
9. Other Bottles/Containers	2/24/15 n/a	T1500336-009	80.11	11.62	0.11	6.56	0.026		
10. Plastic Film/Wrap	2/24/15 n/a	T1500336-010	73.01	11.47	1.49	7.92	0.107		
11. Plastic Products	2/24/15 n/a	T1500336-011	58.87	7.42	0.17	29.51	0.036		
12. R/C Plastics	2/24/15 n/a	T1500336-012	74.41	8.85	0.41	11.45	0.237		
25. Green/Yard Waste	2/24/15 n/a	T1500336-013	42.56	3.79	1.54	30.34	0.415		
26/27. Branches/Twigs/Stumps	2/24/15 n/a	T1500336-014	47.66	5.23	0.88	40.85	0.253		
28. Untreated/Clean Wood	2/24/15 n/a	T1500336-015	48.54	5.30	0.10	39.89	0.054		

Certificate of Analysis

Sample ID:	Sample Date & Time:	Lab #:	Carbon	Hydrogen	Nitrogen	Oxygen	Sulfur		
				D5373		Calculated	D4239		
			Moist. Free wt%	Moist. Free wt%	Moist. Free wt%	Moist. Free wt%	Moist. Free wt%		
31. Food	2/24/15 n/a	T1500336-016	50.91	6.23	4.19	26.80	0.335		
32. Textiles & Leathers	2/24/15 n/a	T1500336-017	52.79	5.36	0.99	28.11	0.461		
33. Rubber	2/24/15 n/a	T1500336-018	61.25	7.53	0.54	11.90	0.826		
34. Carpet/Padding	2/24/15 n/a	T1500336-019	50.87	6.34	0.11	37.26	0.039		
35. R/C Misc. Organics	2/24/15 n/a	T1500336-020	25.95	2.35	1.87	19.84	0.340		
45. Mixed Residue	2/24/15 n/a	T1500336-021	23.95	3.16	1.38	10.67	0.436		

Certificate of Analysis

Sample ID:	Sample Date & Time:		Lab#:		Heating Value D5865 As Received BTU/lb	Heating Value D5865 Moist. Free BTU/lb			
1. Carboard & Kraft	2/24/15	n/a	T1500336-001		5,811	7,959			
2. Newspaper	2/24/15	n/a	T1500336-002		5,126	6,753			
3. Office Paper	2/24/15	n/a	T1500336-003		5,165	6,241			
4. Mixed Paper	2/24/15	n/a	T1500336-004		4,966	6,907			
5. Compostable Paper	2/24/15	n/a	T1500336-005		4,615	8,975			
6. R/C Paper	2/24/15	n/a	T1500336-006		5,511	8,029			
7. PET Bottles/Containers	2/24/15	n/a	T1500336-007		10,801	11,108			
8. HDPE Bottles/Containers	2/24/15	n/a	T1500336-008		18,368	19,022			
9. Other Bottles/Containers	2/24/15	n/a	T1500336-009		16,060	17,091			
10. Plastic Film/Wrap	2/24/15	n/a	T1500336-010		13,734	16,334			
11. Plastic Products	2/24/15	n/a	T1500336-011		12,356	12,407			
12. R/C Plastics	2/24/15	n/a	T1500336-012		15,518	16,121			
25. Green/Yard Waste	2/24/15	n/a	T1500336-013		3,018	7,241			
26/27. Branches/Twigs/Stumps	2/24/15	n/a	T1500336-014		6,142	8,099			
28. Untreated/Clean Wood	2/24/15	n/a	T1500336-015		6,930	7,811			

Certificate of Analysis

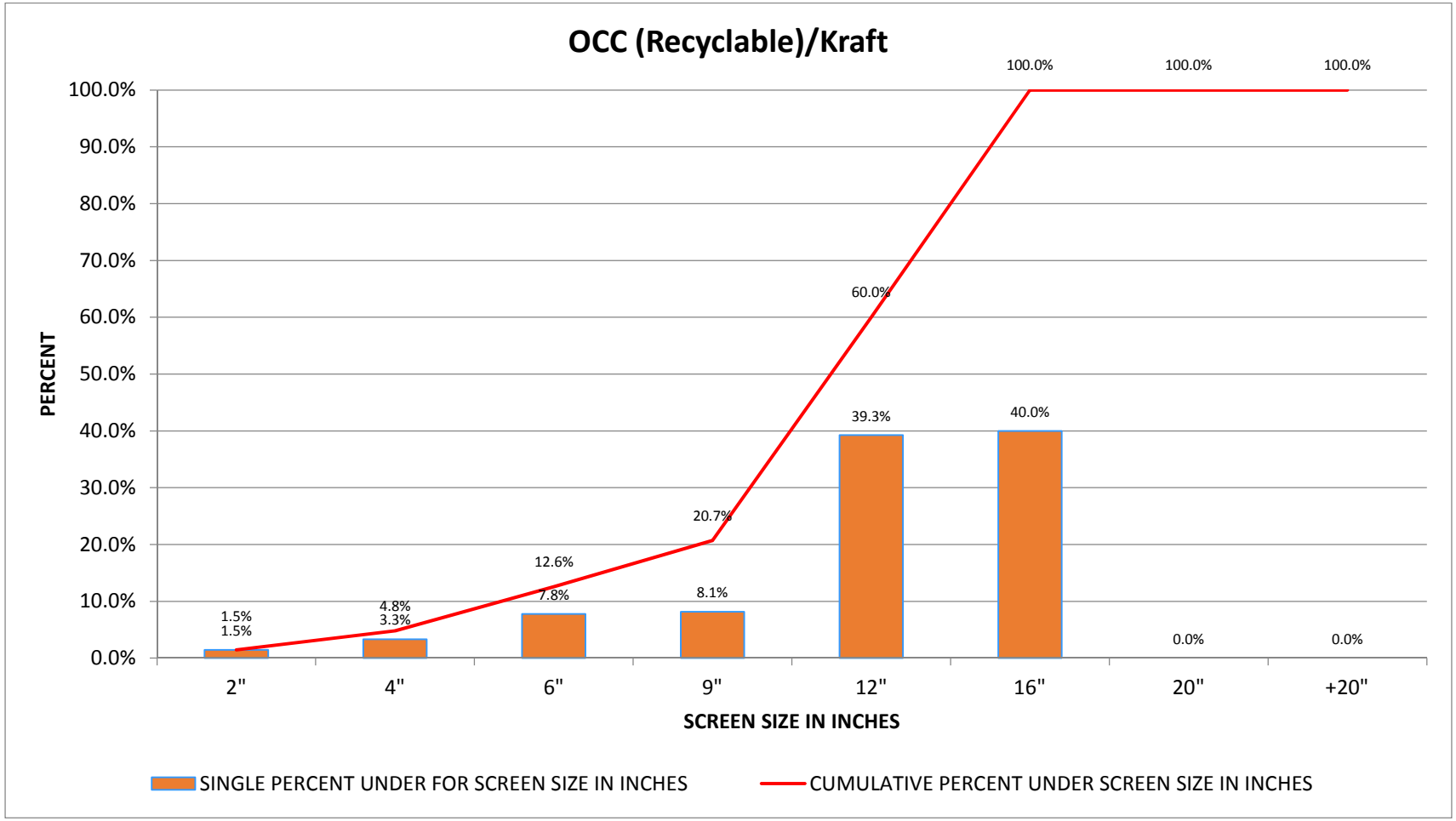
Sample ID:	Sample Date & Time:		Lab#:		Heating Value D5865 As Received BTU/lb	Heating Value D5865 Moist. Free BTU/lb			
31. Food	2/24/15	n/a	T1500336-016		2,557	9,733			
32. Textiles & Leathers	2/24/15	n/a	T1500336-017		7,940	9,170			
33. Rubber	2/24/15	n/a	T1500336-018		10,313	12,348			
34. Carpet/Padding	2/24/15	n/a	T1500336-019		8,321	8,634			
35. R/C Misc. Organics	2/24/15	n/a	T1500336-020		1,643	5,027			
45. Mixed Residue	2/24/15	n/a	T1500336-021		2,362	3,630			

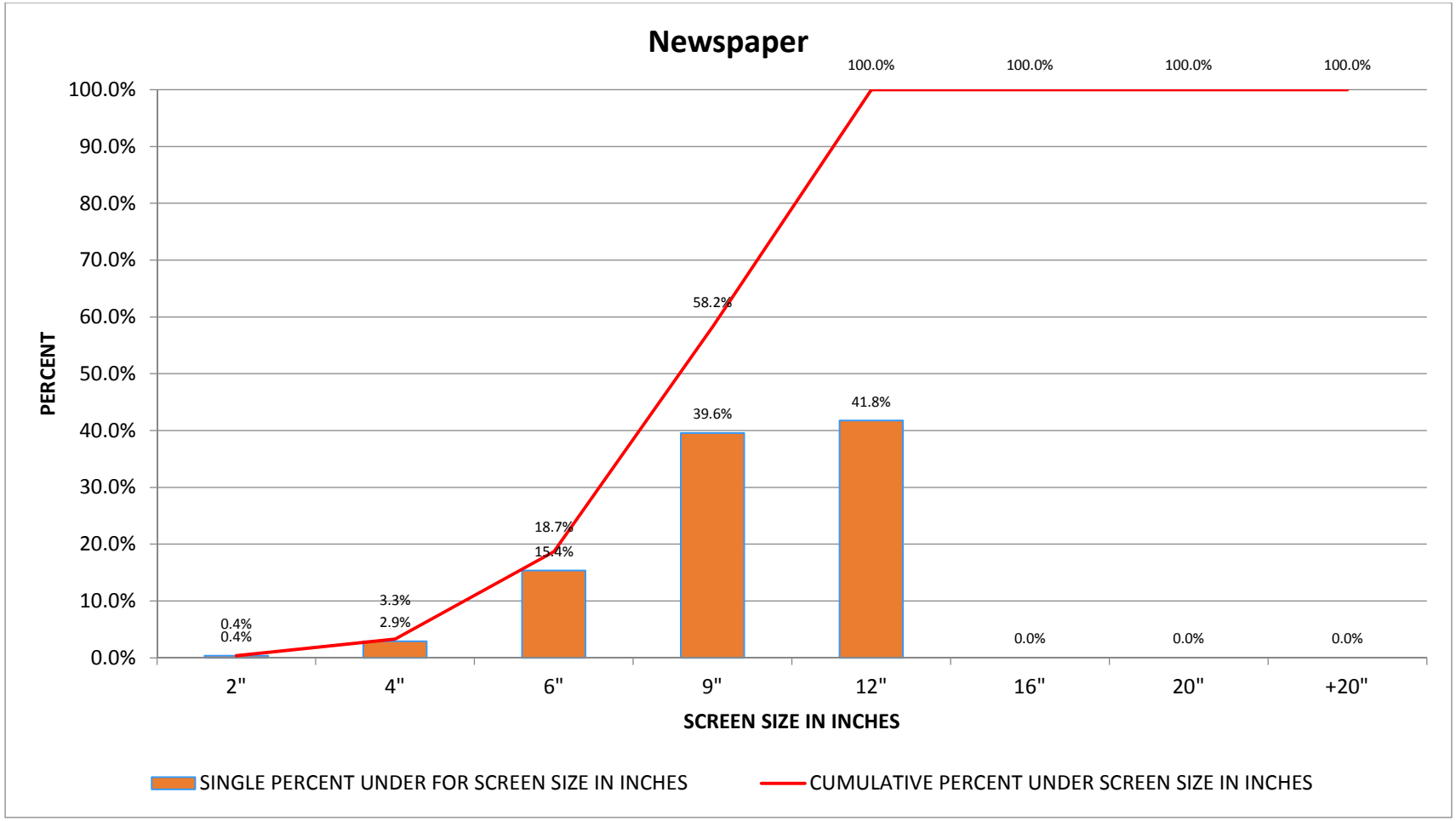
Note:

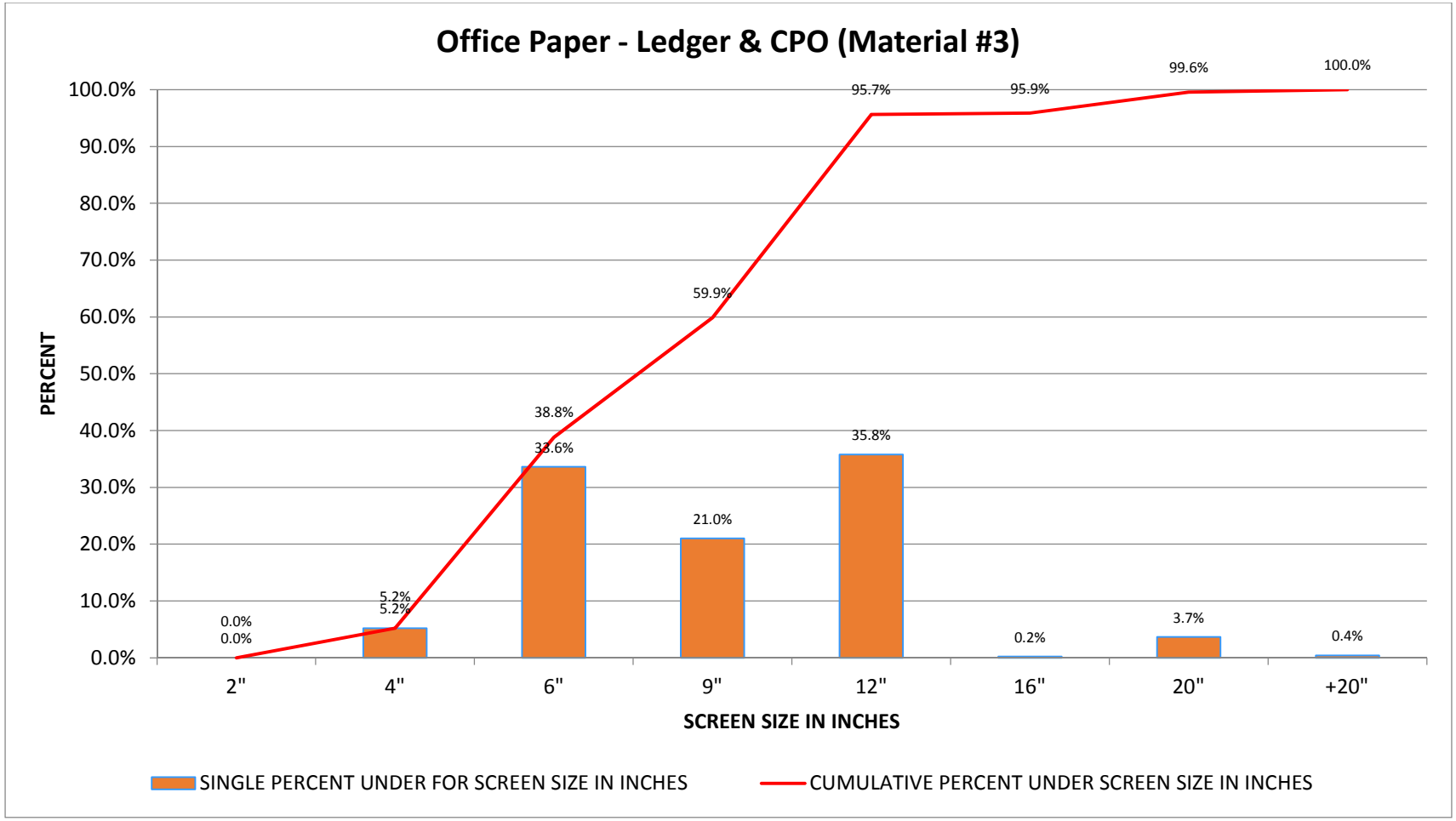
Solid samples were air dried at 40°C for several days, measured for moisture loss, coarse ground to < 6mm, and split into sub-samples, one for storage and one for further grinding to < 1mm.

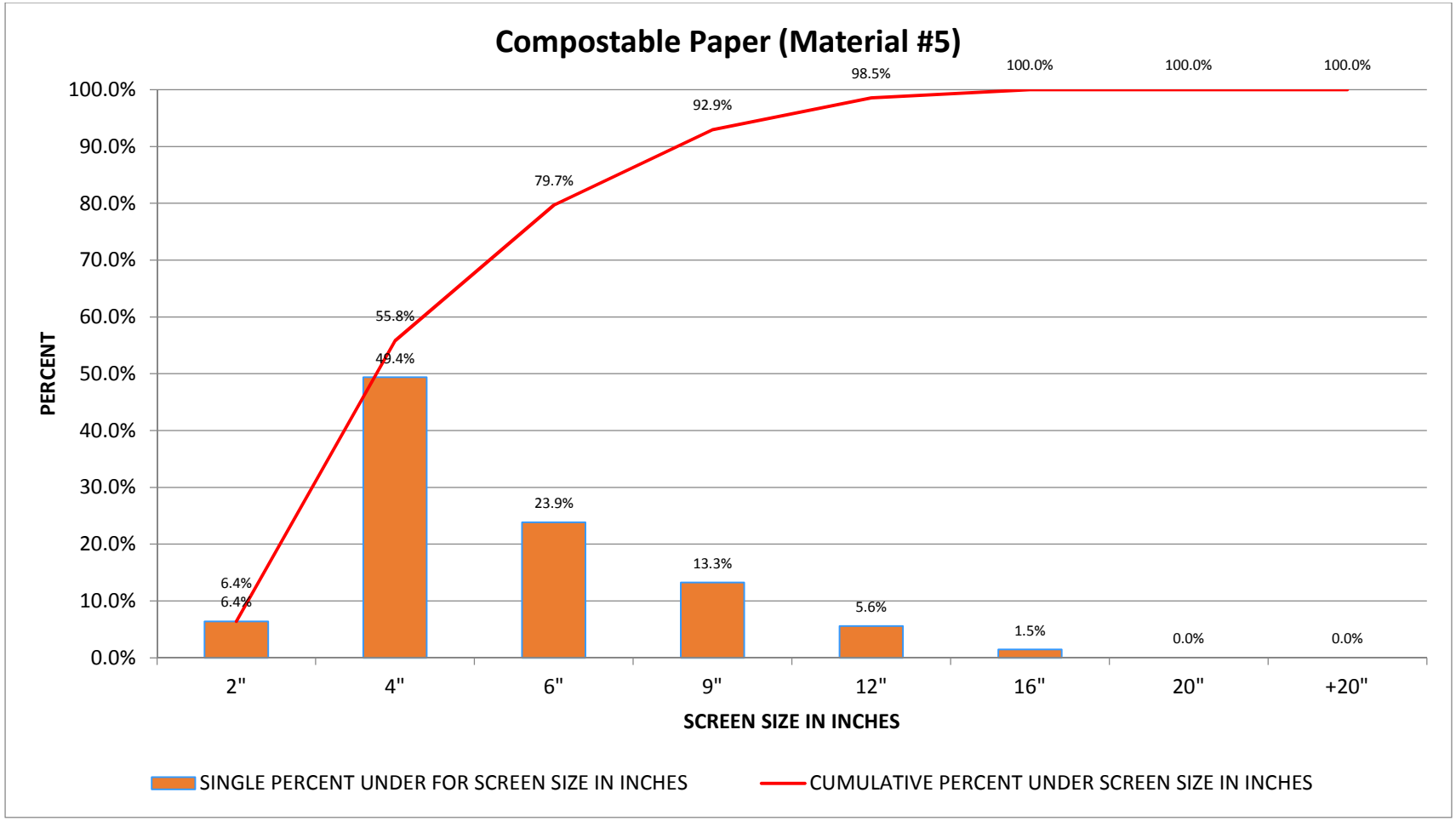
Table C

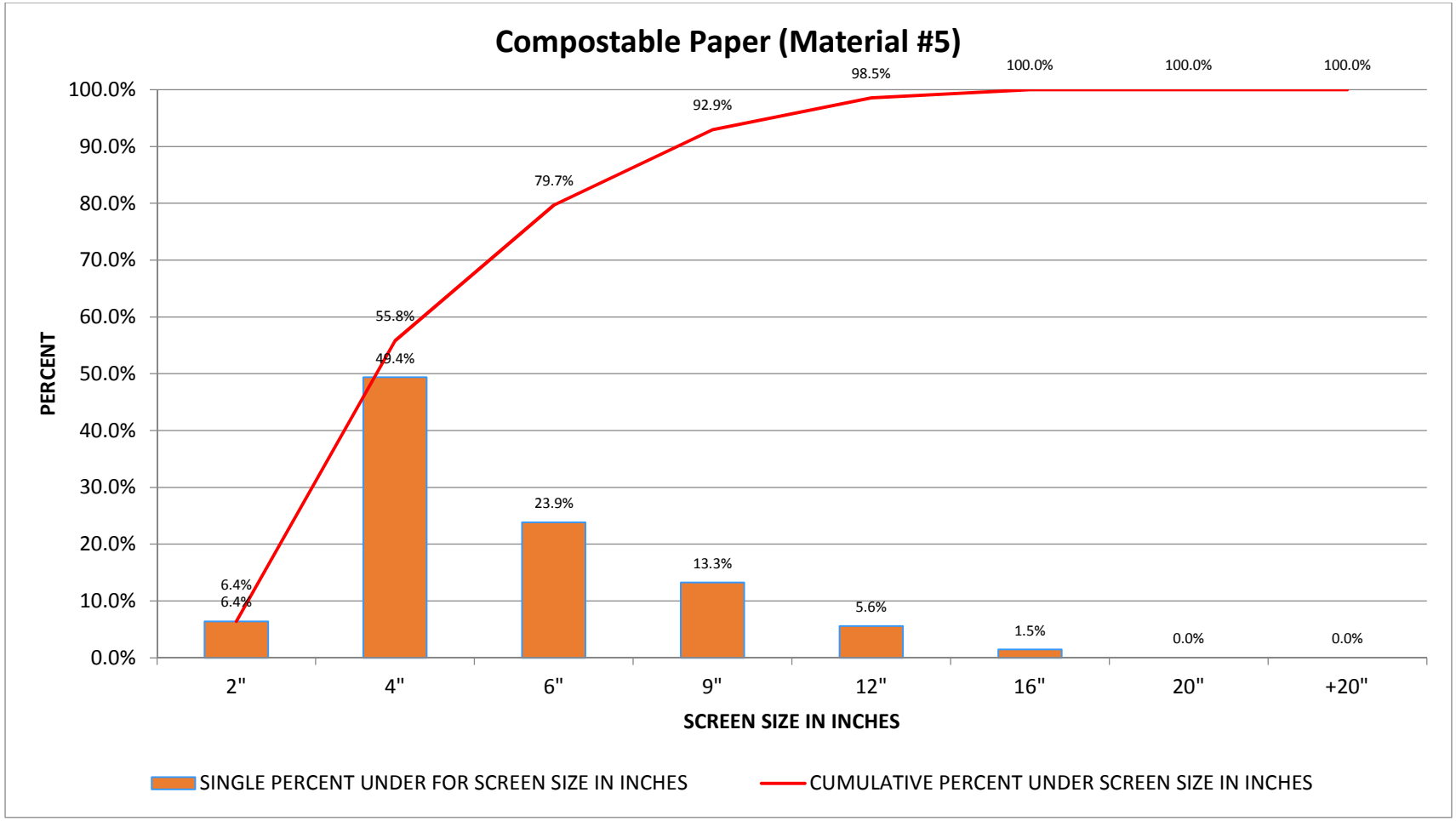
Ecotelesis International: Size Screening Results

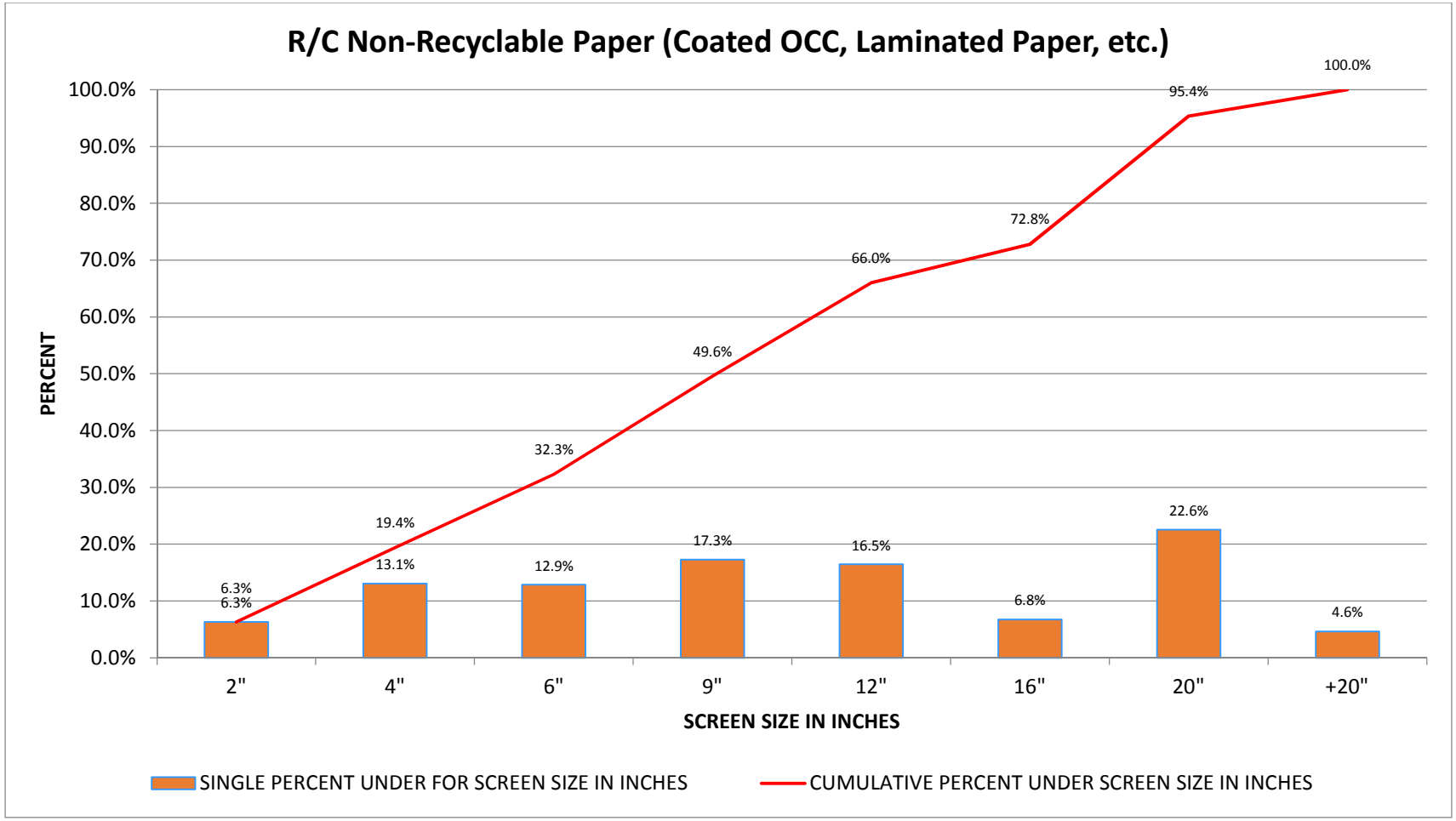


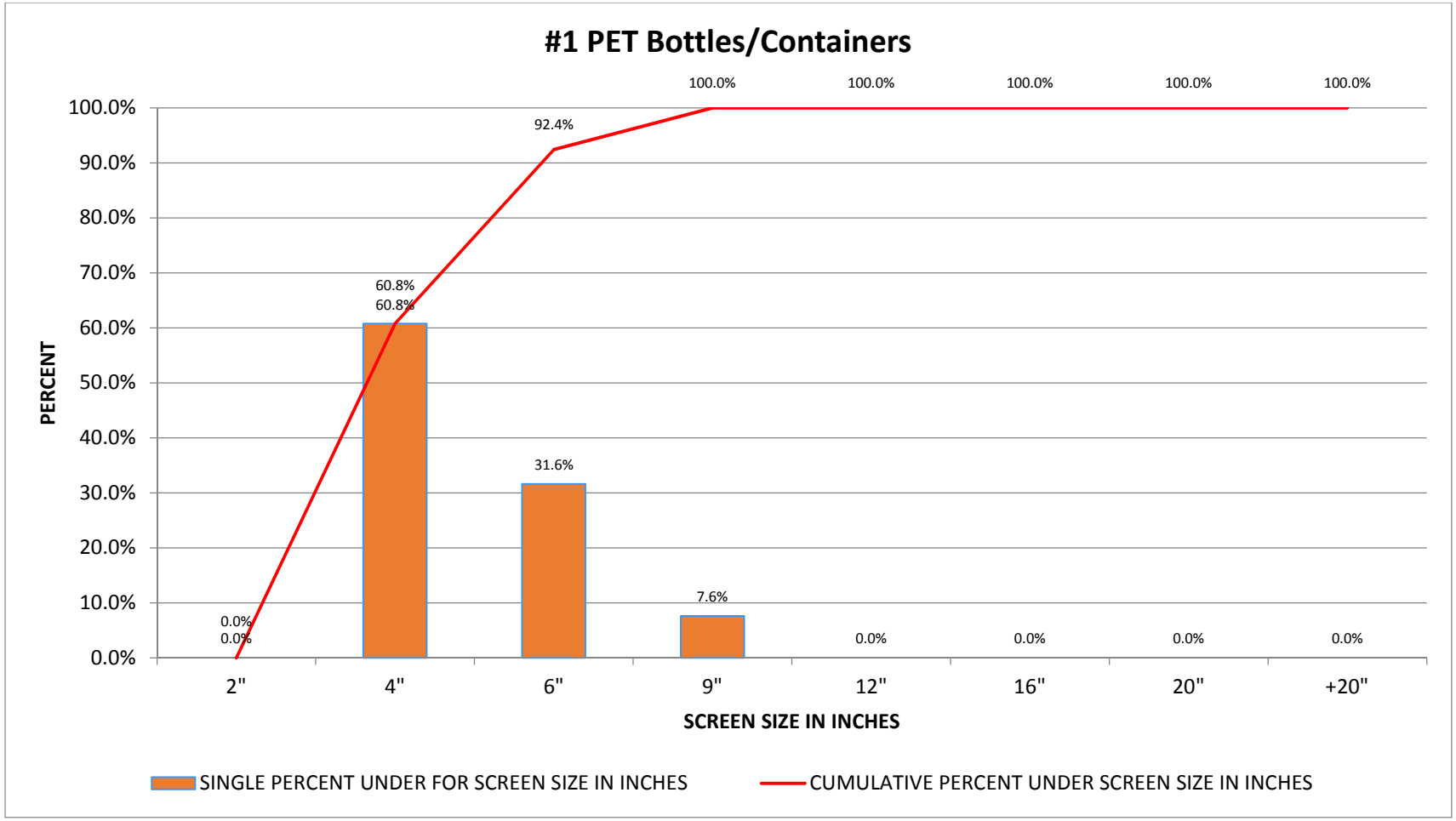

Newspaper
100.0%
90.0%
80.0%
70.0%
60.0%
50.0%
40.0%
30.0%
20.0%
10.0%
0.0%
PERCENT
0.4%
0.4%
3.3%
2.9%
18.7%
15.4%
58.2%
39.6%
41.8%
100.0%
100.0%
100.0%
100.0%
0.0%
0.0%
0.0%
2"
4"
6"
9"
12"
16"
20"
+20"
SCREEN SIZE IN INCHES
SINGLE PERCENT UNDER FOR SCREEN SIZE IN INCHES
CUMULATIVE PERCENT UNDER SCREEN SIZE IN INCHES

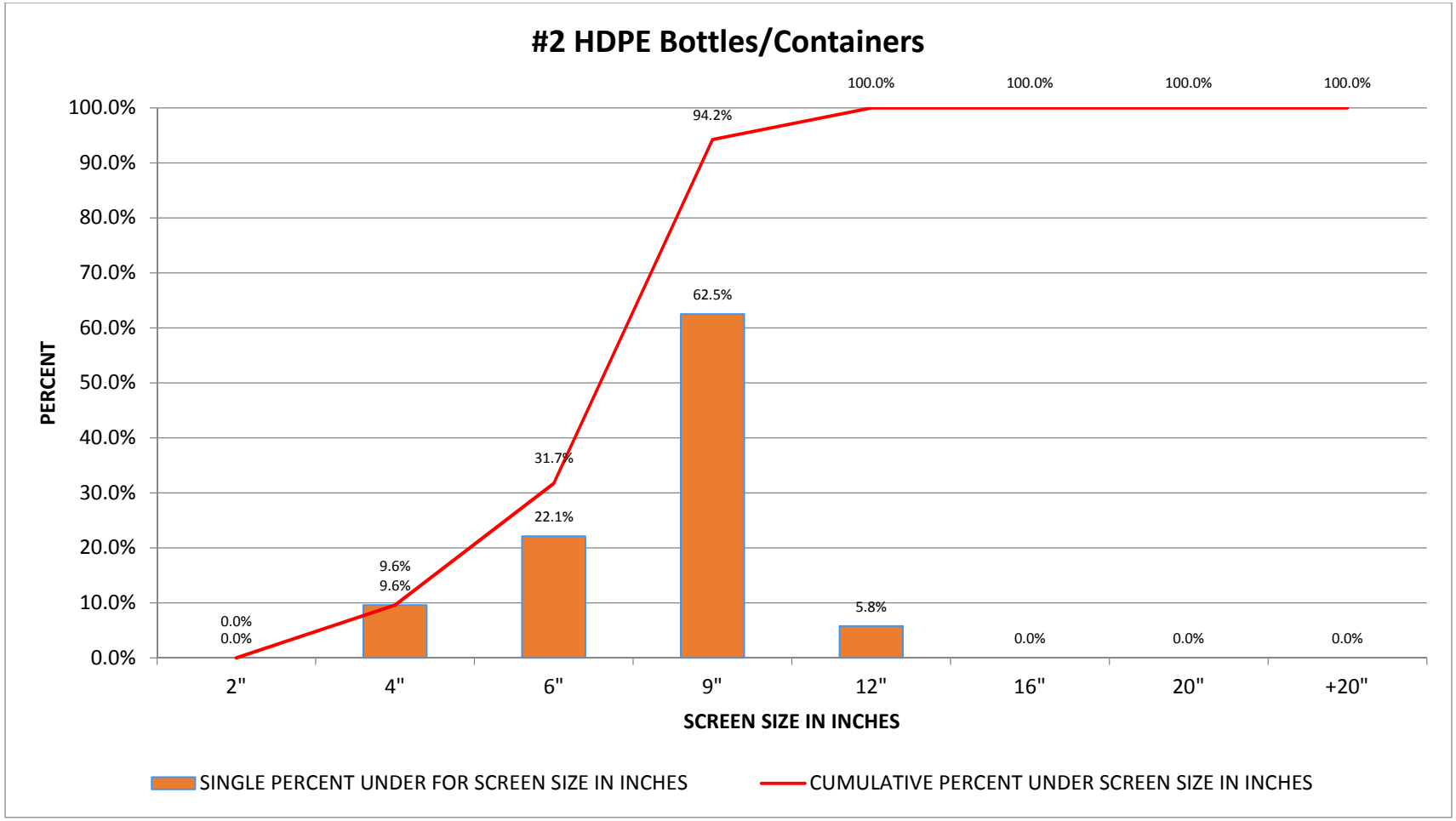

Office Paper - Ledger & CPO (Material #3)
PERCENT
100.0%
90.0%
80.0%
70.0%
60.0%
50.0%
40.0%
30.0%
20.0%
10.0%
0.0%
0.0%
0.0%
5.2%
5.2%
38.8%
33.6%
59.9%
21.0%
95.7%
35.8%
95.9%
0.2%
99.6%
3.7%
100.0%
0.4%
2"
4"
6"
9"
12"
16"
20"
+20"
SCREEN SIZE IN INCHES
SINGLE PERCENT UNDER FOR SCREEN SIZE IN INCHES
CUMULATIVE PERCENT UNDER SCREEN SIZE IN INCHES

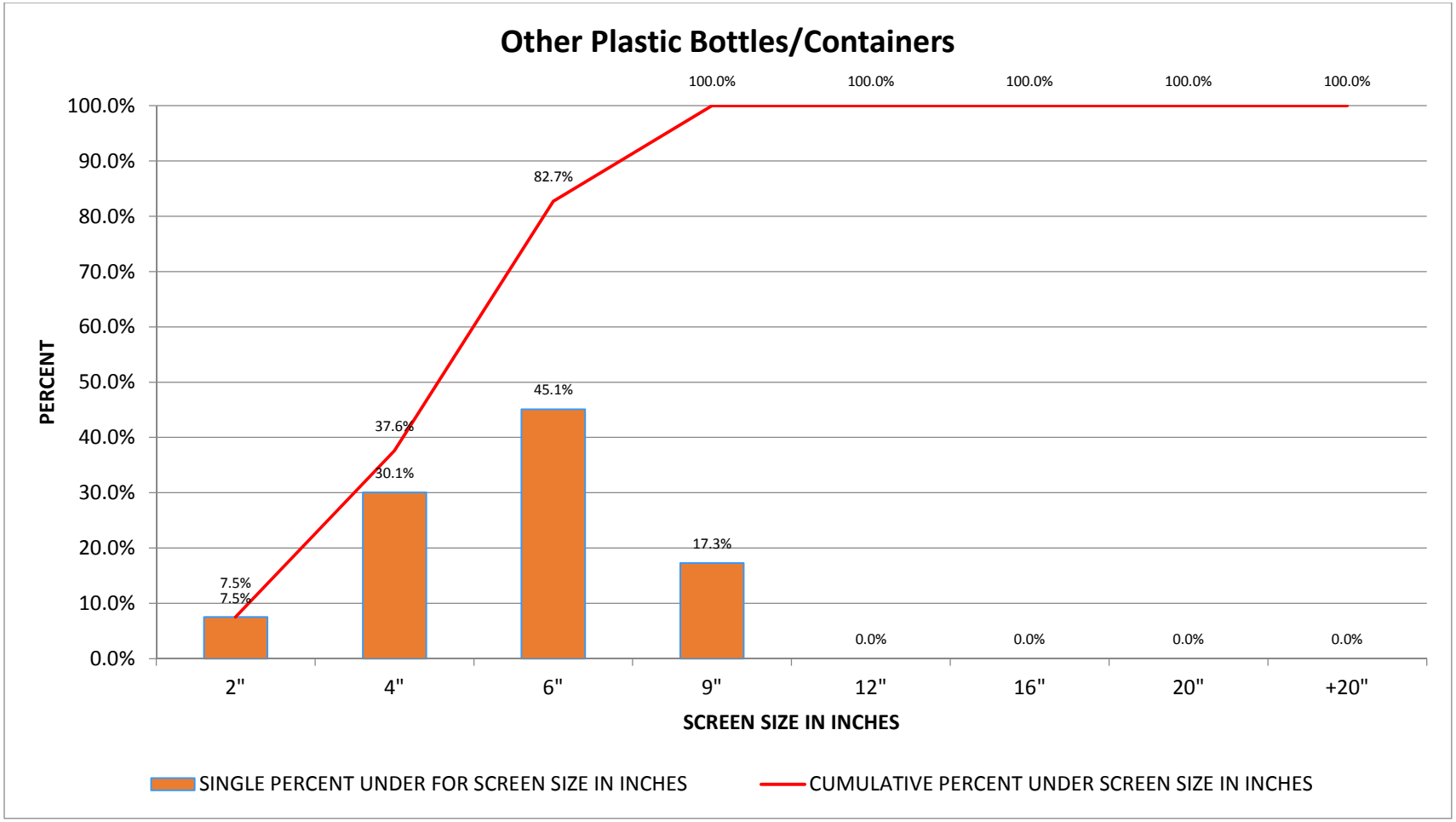

Compostable Paper (Material #5)
100.0%
90.0%
80.0%
70.0%
60.0%
50.0%
40.0%
30.0%
20.0%
10.0%
0.0%
PERCENT
6.4%
6.4%
55.8%
49.4%
79.7%
23.9%
92.9%
13.3%
98.5%
5.6%
100.0%
1.5%
100.0%
0.0%
100.0%
0.0%
2"
4"
6"
9"
12"
16"
20"
+20"
SCREEN SIZE IN INCHES
SINGLE PERCENT UNDER FOR SCREEN SIZE IN INCHES
CUMULATIVE PERCENT UNDER SCREEN SIZE IN INCHES

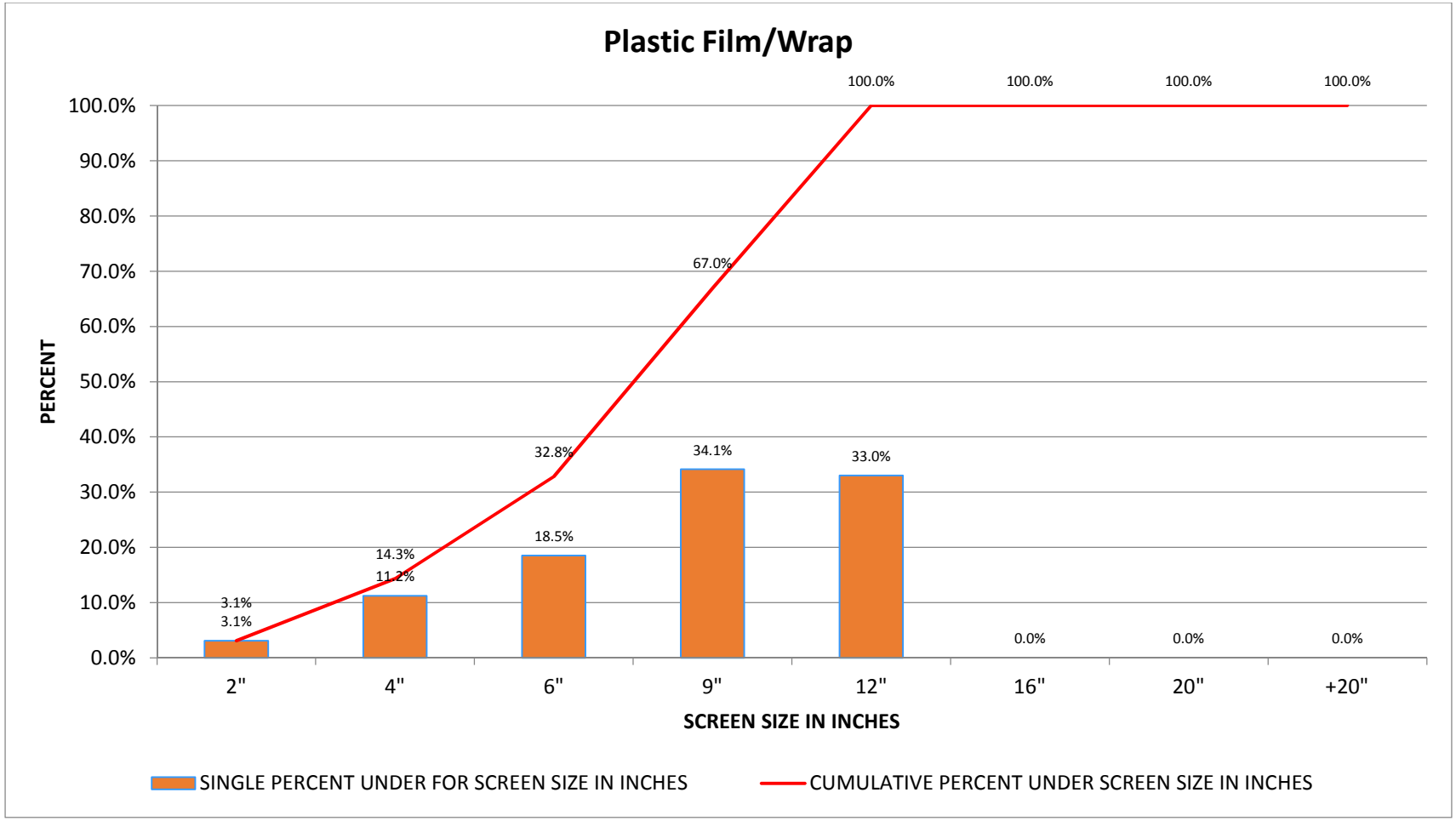

Compostable Paper (Material #5)
100.0%
90.0%
80.0%
70.0%
60.0%
50.0%
40.0%
30.0%
20.0%
10.0%
0.0%
PERCENT
6.4%
6.4%
55.8%
49.4%
79.7%
23.9%
92.9%
13.3%
98.5%
5.6%
100.0%
1.5%
100.0%
0.0%
100.0%
0.0%
2"
4"
6"
9"
12"
16"
20"
+20"
SCREEN SIZE IN INCHES
SINGLE PERCENT UNDER FOR SCREEN SIZE IN INCHES
CUMULATIVE PERCENT UNDER SCREEN SIZE IN INCHES

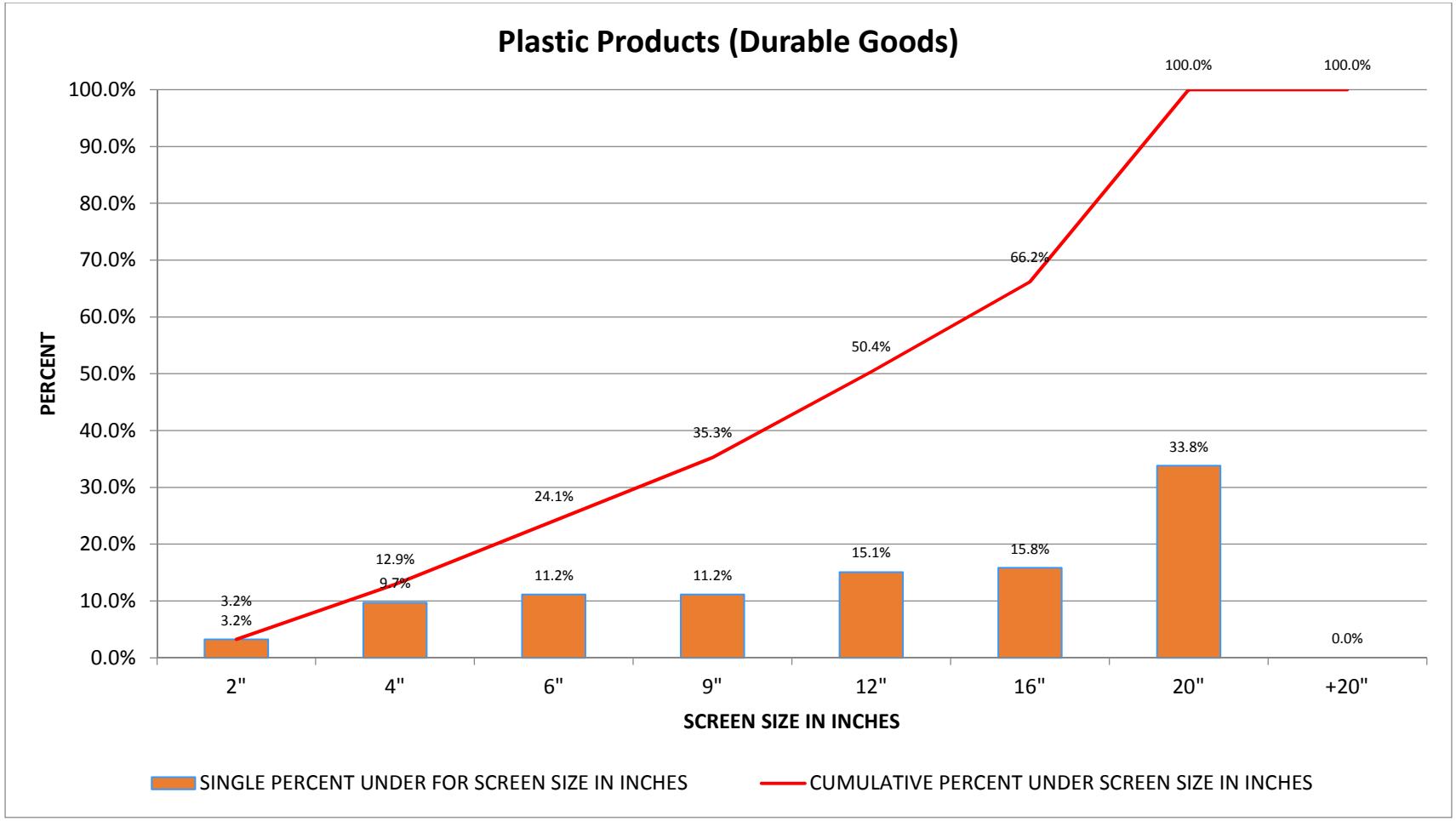

R/C Non-Recyclable Paper (Coated OCC, Laminated Paper, etc.)
100.0%
90.0%
80.0%
70.0%
60.0%
50.0%
40.0%
30.0%
20.0%
10.0%
0.0%
PERCENT
6.3%
19.4%
32.3%
49.6%
66.0%
72.8%
95.4%
100.0%
6.3%
13.1%
12.9%
17.3%
16.5%
6.8%
22.6%
4.6%
2"
4"
6"
9"
12"
16"
20"
+20"
SCREEN SIZE IN INCHES
SINGLE PERCENT UNDER FOR SCREEN SIZE IN INCHES
CUMULATIVE PERCENT UNDER SCREEN SIZE IN INCHES

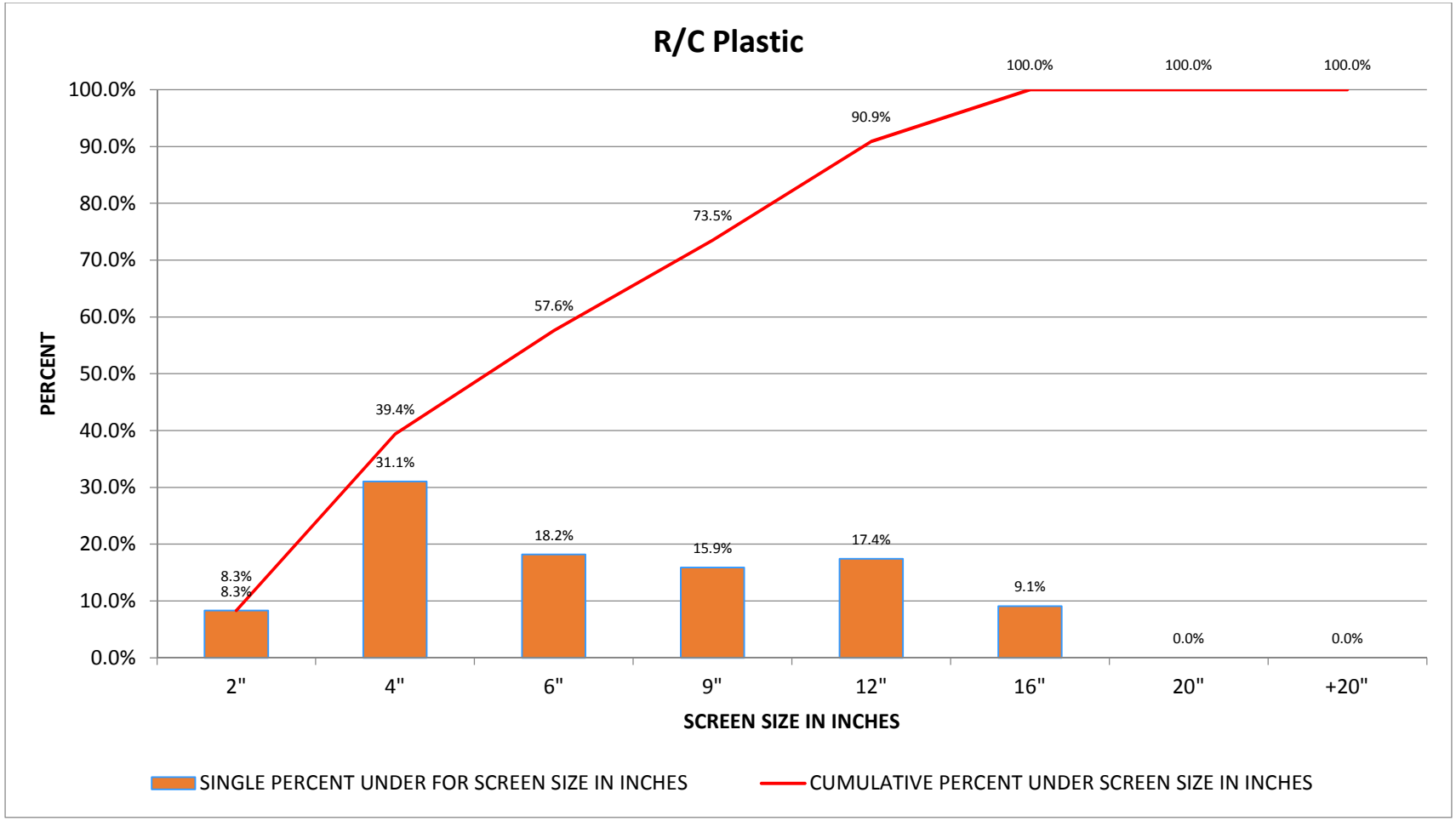

#1 PET Bottles/Containers
100.0%
90.0%
80.0%
70.0%
60.0%
50.0%
40.0%
30.0%
20.0%
10.0%
0.0%
PERCENT
100.0%
100.0%
100.0%
100.0%
100.0%
92.4%
60.8%
60.8%
31.6%
7.6%
0.0%
0.0%
0.0%
0.0%
0.0%
0.0%
2"
4"
6"
9"
12"
16"
20"
+20"
SCREEN SIZE IN INCHES
SINGLE PERCENT UNDER FOR SCREEN SIZE IN INCHES
CUMULATIVE PERCENT UNDER SCREEN SIZE IN INCHES

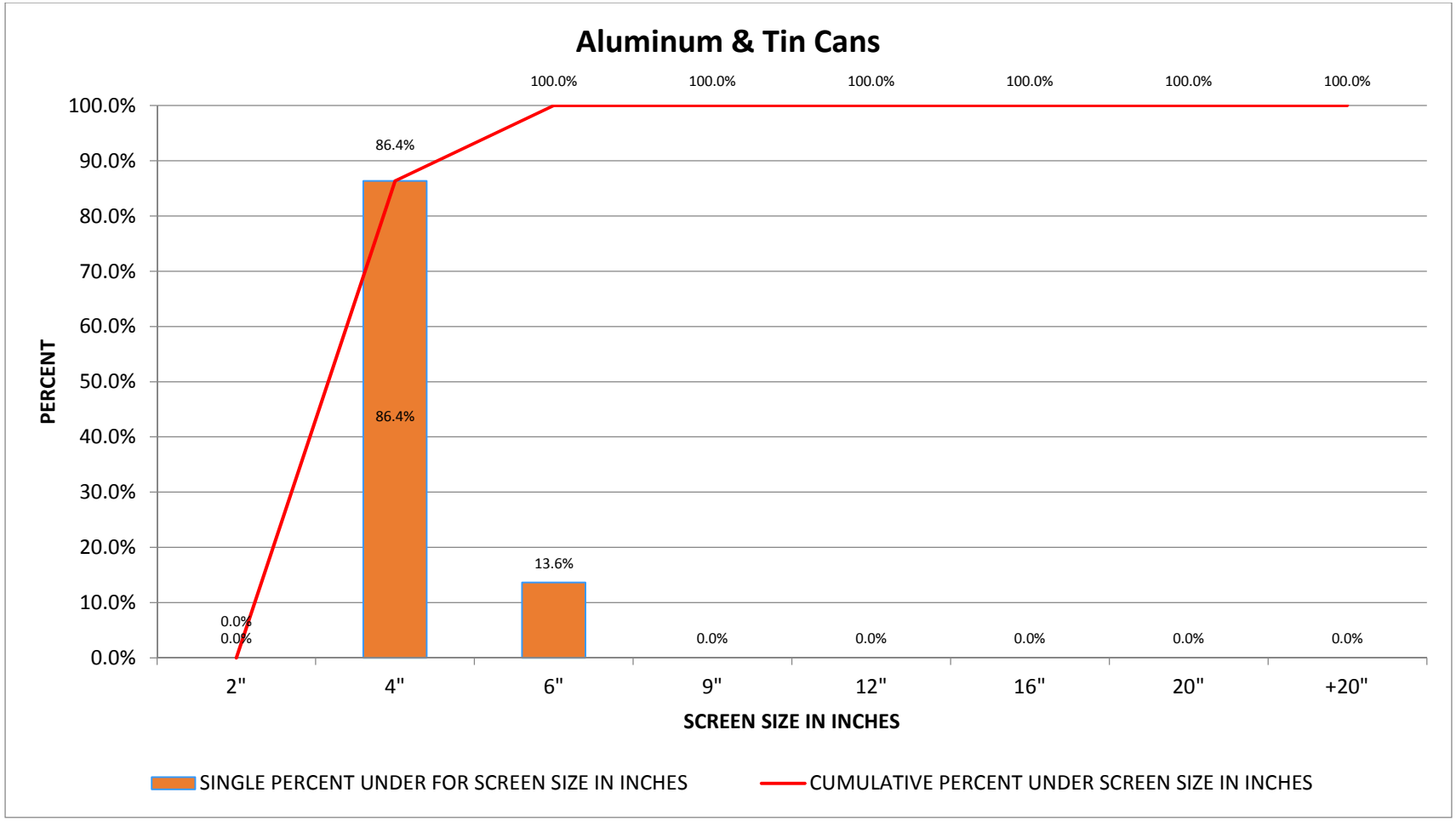

#2 HDPE Bottles/Containers
100.0%
90.0%
80.0%
70.0%
60.0%
50.0%
40.0%
30.0%
20.0%
10.0%
0.0%
PERCENT
0.0%
0.0%
9.6%
9.6%
31.7%
22.1%
62.5%
94.2%
5.8%
100.0%
100.0%
100.0%
100.0%
0.0%
0.0%
0.0%
2"
4"
6"
9"
12"
16"
20"
+20"
SCREEN SIZE IN INCHES
SINGLE PERCENT UNDER FOR SCREEN SIZE IN INCHES
CUMULATIVE PERCENT UNDER SCREEN SIZE IN INCHES

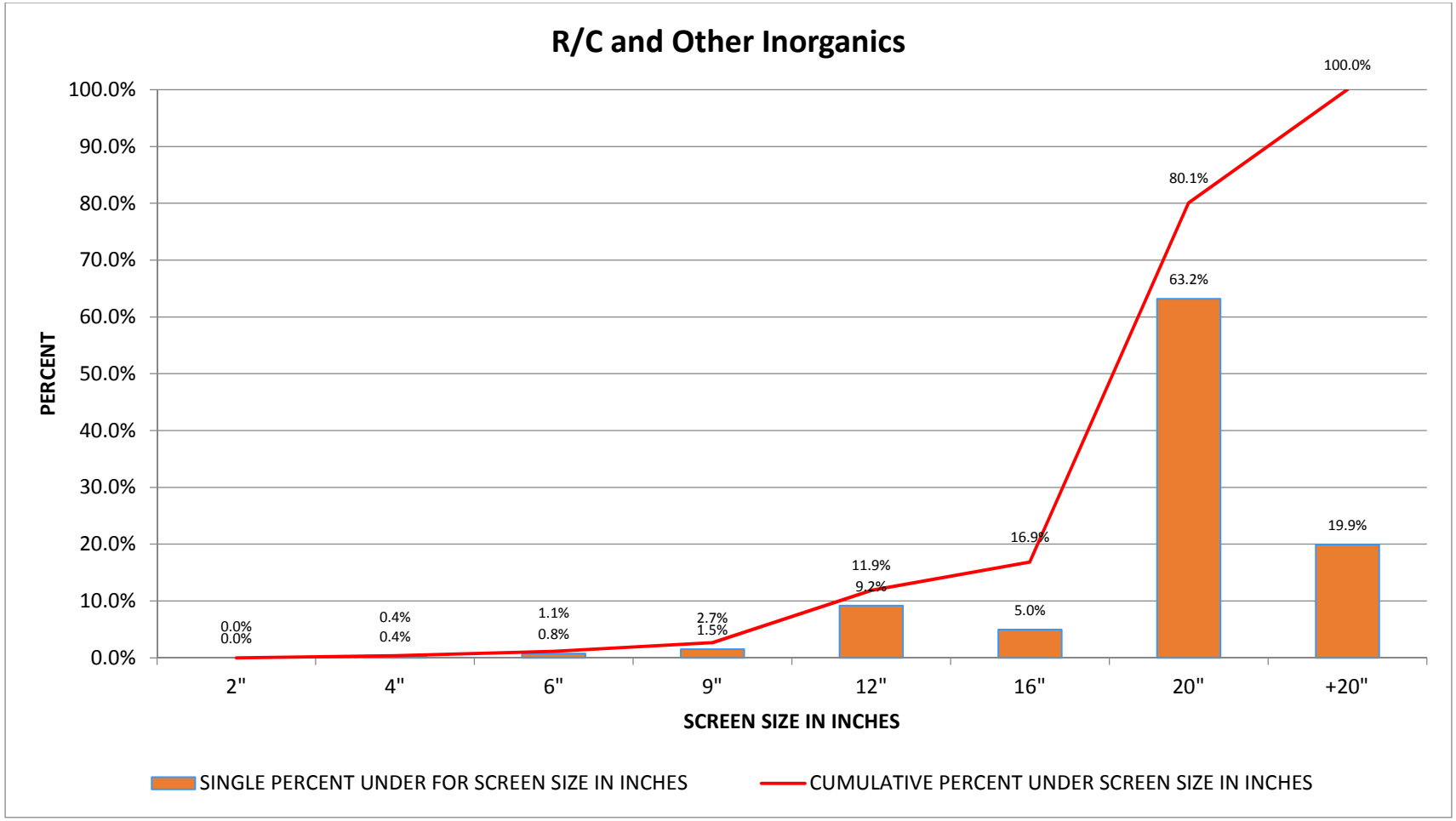

Other Plastic Bottles/Containers
100.0%
90.0%
80.0%
70.0%
60.0%
50.0%
40.0%
30.0%
20.0%
10.0%
0.0%
PERCENT
100.0%
100.0%
100.0%
100.0%
100.0%
82.7%
45.1%
37.6%
30.1%
17.3%
7.5%
7.5%
0.0%
0.0%
0.0%
0.0%
2"
4"
6"
9"
12"
16"
20"
+20"
SCREEN SIZE IN INCHES
SINGLE PERCENT UNDER FOR SCREEN SIZE IN INCHES
CUMULATIVE PERCENT UNDER SCREEN SIZE IN INCHES

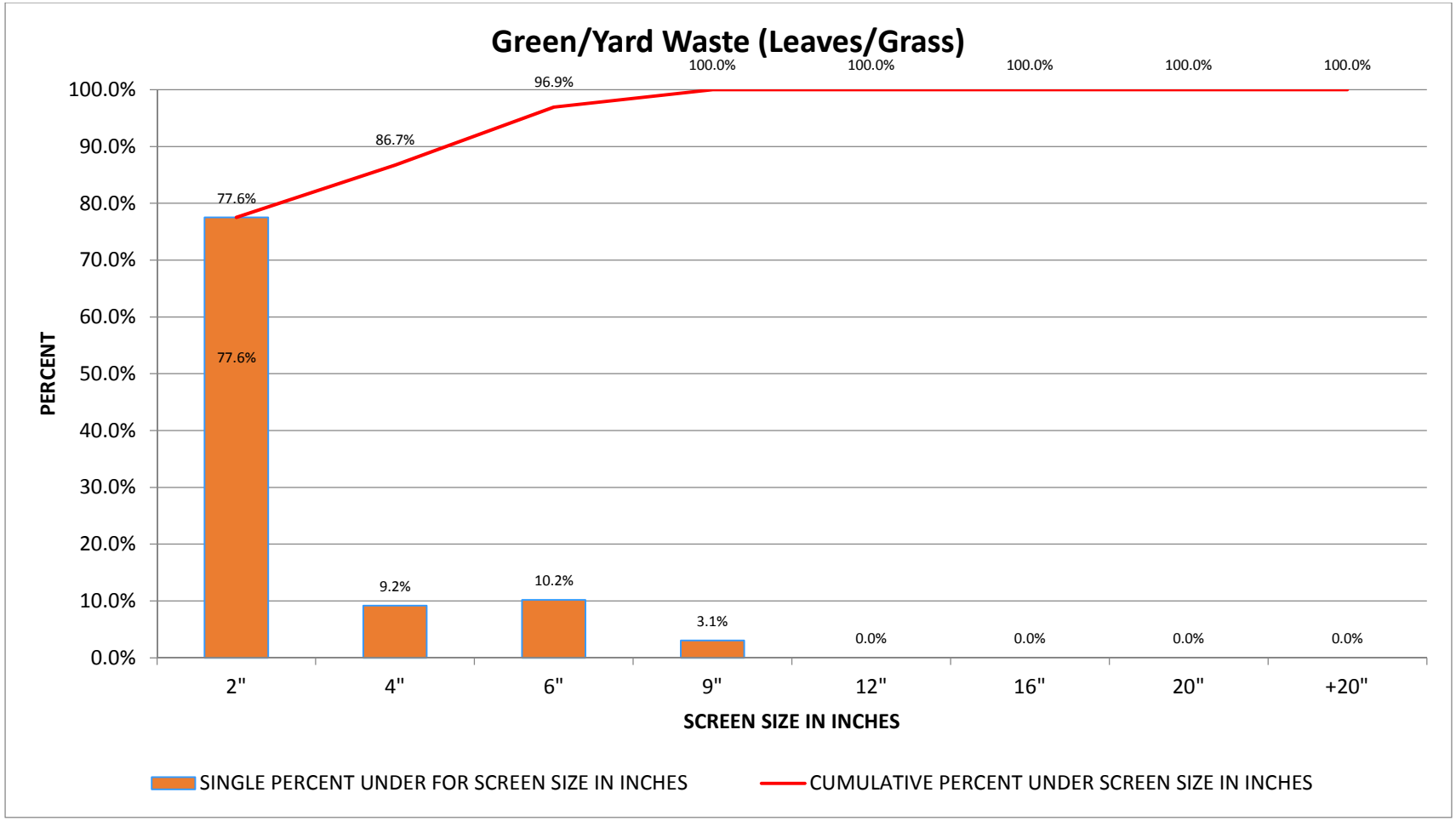

Plastic Film/Wrap
100.0%
90.0%
80.0%
70.0%
60.0%
50.0%
40.0%
30.0%
20.0%
10.0%
0.0%
PERCENT
3.1%
3.1%
14.3%
11.2%
32.8%
18.5%
67.0%
34.1%
33.0%
0.0%
0.0%
0.0%
100.0%
100.0%
100.0%
100.0%
2"
4"
6"
9"
12"
16"
20"
+20"
SCREEN SIZE IN INCHES
SINGLE PERCENT UNDER FOR SCREEN SIZE IN INCHES
CUMULATIVE PERCENT UNDER SCREEN SIZE IN INCHES

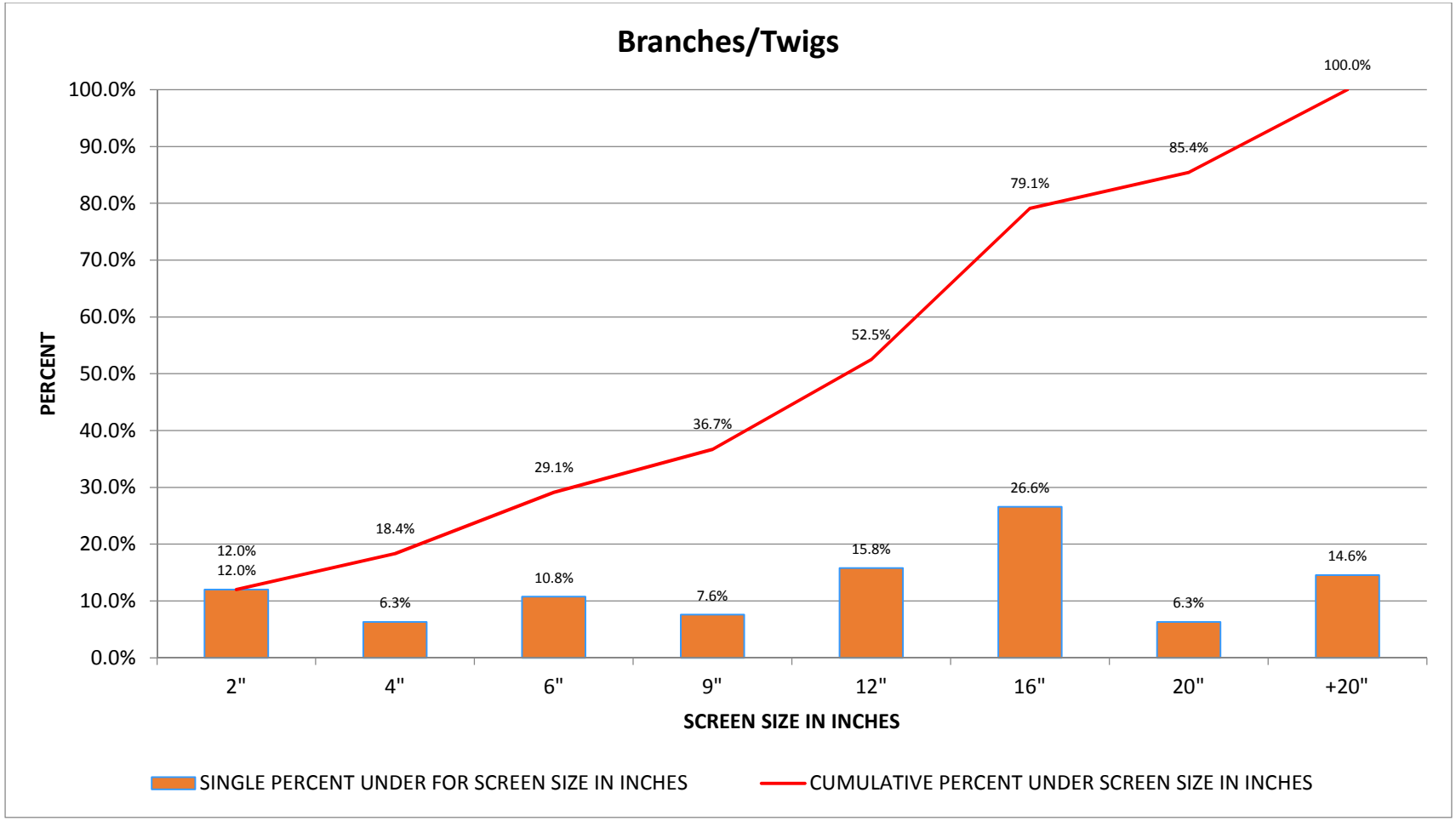

Plastic Products (Durable Goods)
100.0%
90.0%
80.0%
70.0%
60.0%
50.0%
40.0%
30.0%
20.0%
10.0%
0.0%
PERCENT
3.2%
3.2%
12.9%
9.7%
24.1%
11.2%
35.3%
11.2%
50.4%
15.1%
66.2%
15.8%
100.0%
33.8%
100.0%
0.0%
2"
4"
6"
9"
12"
16"
20"
+20"
SCREEN SIZE IN INCHES
SINGLE PERCENT UNDER FOR SCREEN SIZE IN INCHES
CUMULATIVE PERCENT UNDER SCREEN SIZE IN INCHES

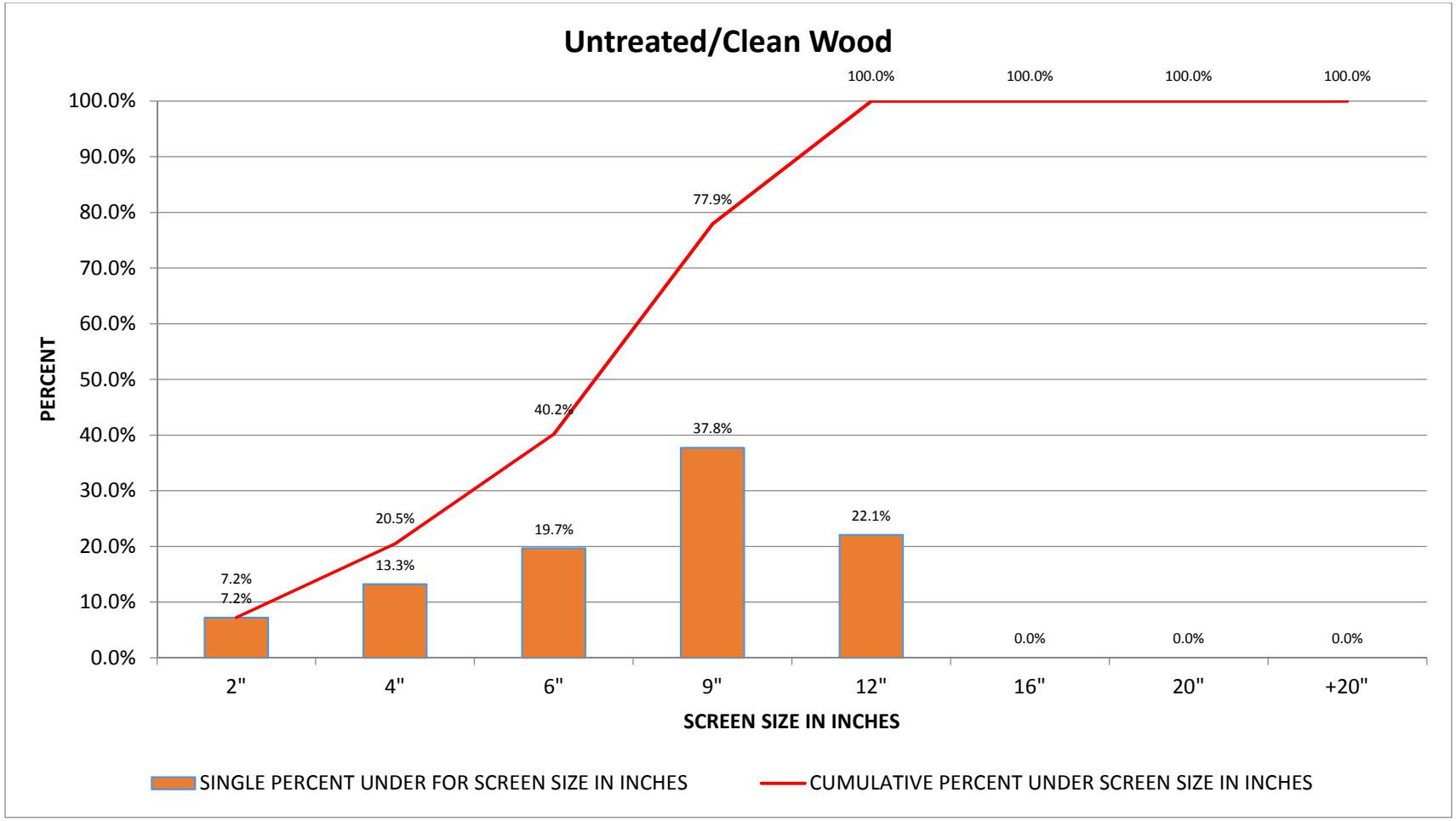

R/C Plastic
100.0%
90.0%
80.0%
70.0%
60.0%
50.0%
40.0%
30.0%
20.0%
10.0%
0.0%
PERCENT
8.3%
8.3%
39.4%
31.1%
57.6%
18.2%
73.5%
15.9%
90.9%
17.4%
100.0%
9.1%
100.0%
0.0%
100.0%
0.0%
2"
4"
6"
9"
12"
16"
20"
+20"
SCREEN SIZE IN INCHES
SINGLE PERCENT UNDER FOR SCREEN SIZE IN INCHES
CUMULATIVE PERCENT UNDER SCREEN SIZE IN INCHES

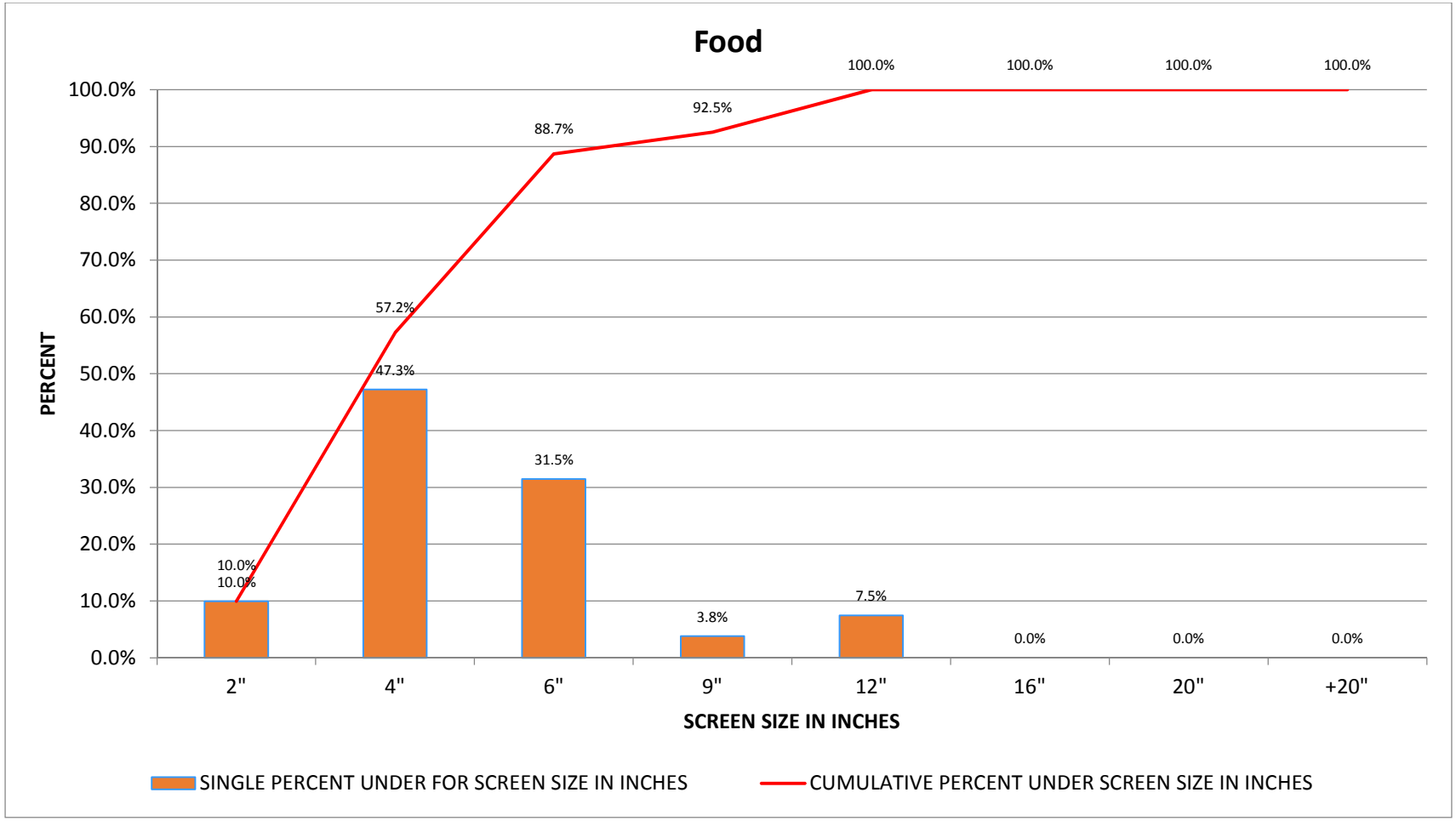

Aluminum & Tin Cans
100.0%
100.0%
100.0%
100.0%
100.0%
100.0%
86.4%
86.4%
13.6%
0.0%
0.0%
0.0%
0.0%
0.0%
0.0%
0.0%
100.0%
90.0%
80.0%
70.0%
60.0%
50.0%
40.0%
30.0%
20.0%
10.0%
0.0%
PERCENT
2"
4"
6"
9"
12"
16"
20"
+20"
SCREEN SIZE IN INCHES
SINGLE PERCENT UNDER FOR SCREEN SIZE IN INCHES
CUMULATIVE PERCENT UNDER SCREEN SIZE IN INCHES

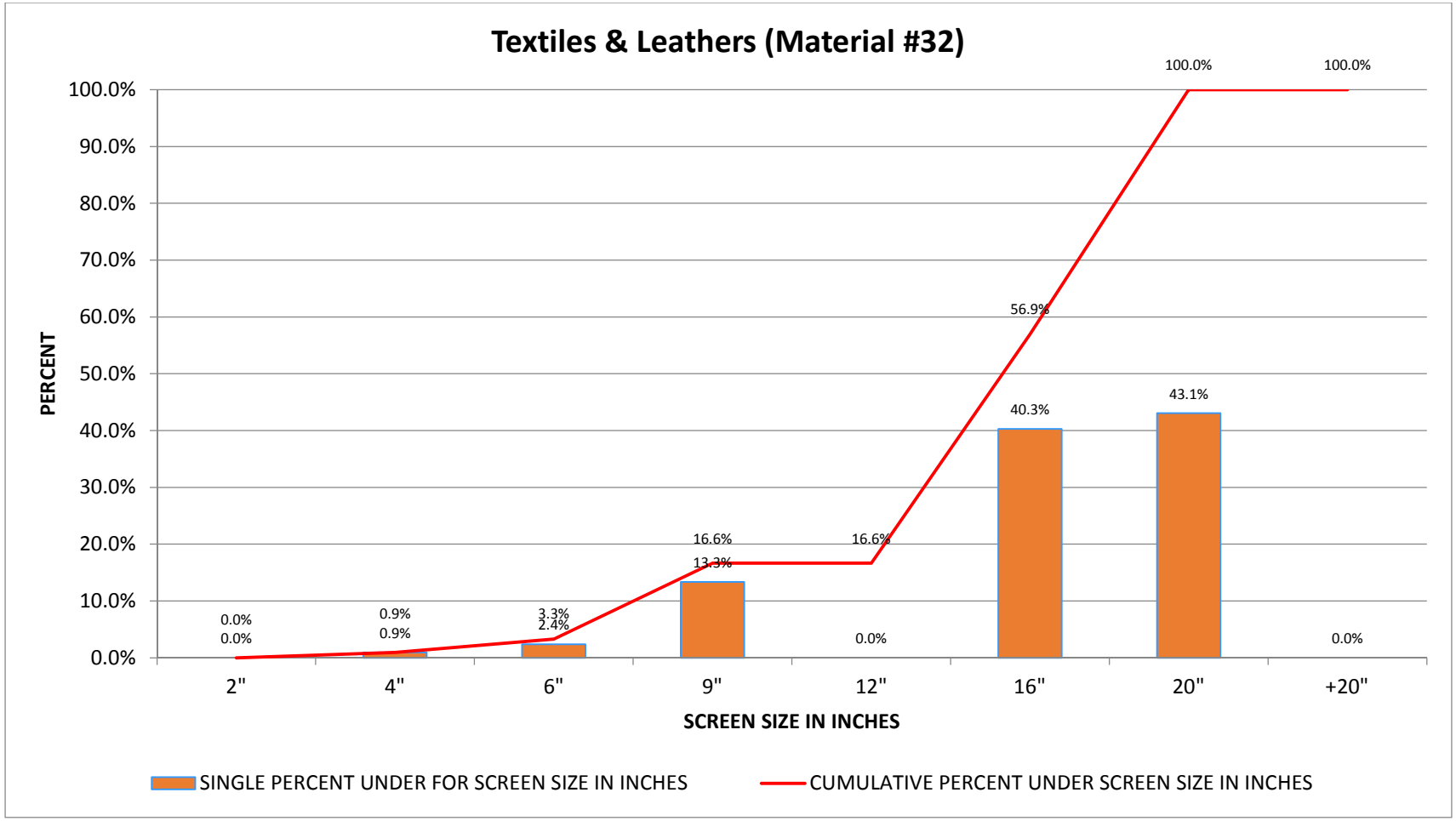

R/C and Other Inorganics
100.0%
90.0%
80.0%
70.0%
60.0%
50.0%
40.0%
30.0%
20.0%
10.0%
0.0%
PERCENT
0.0%
0.0%
0.4%
0.4%
1.1%
0.8%
2.7%
1.5%
11.9%
9.2%
16.9%
5.0%
80.1%
63.2%
100.0%
19.9%
2"
4"
6"
9"
12"
16"
20"
+20"
SCREEN SIZE IN INCHES
SINGLE PERCENT UNDER FOR SCREEN SIZE IN INCHES
CUMULATIVE PERCENT UNDER SCREEN SIZE IN INCHES

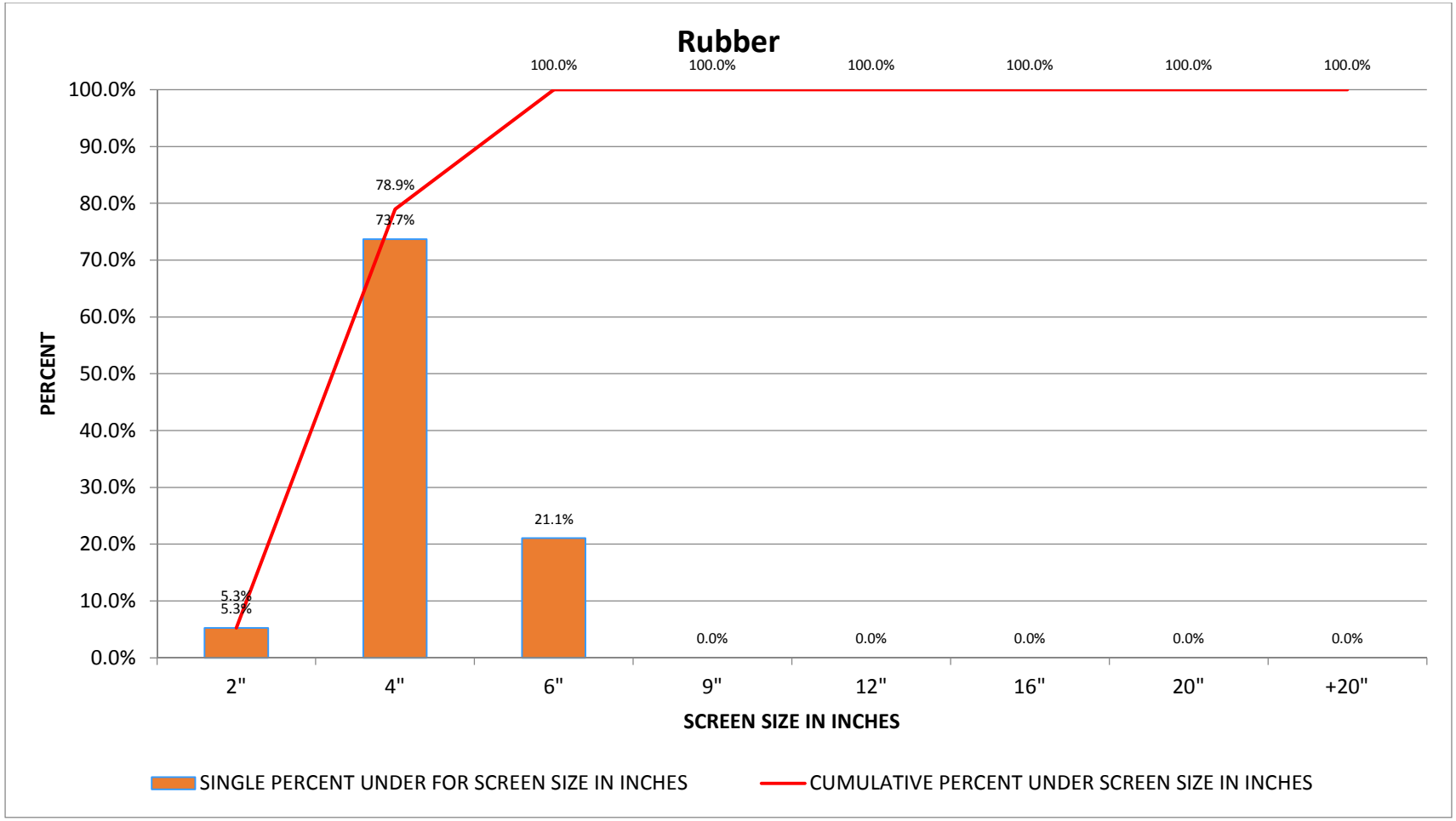

Green/Yard Waste (Leaves/Grass)
100.0%
90.0%
80.0%
70.0%
60.0%
50.0%
40.0%
30.0%
20.0%
10.0%
0.0%
PERCENT
77.6%
86.7%
96.9%
100.0%
100.0%
100.0%
100.0%
100.0%
77.6%
9.2%
10.2%
3.1%
0.0%
0.0%
0.0%
0.0%
2"
4"
6"
9"
12"
16"
20"
+20"
SCREEN SIZE IN INCHES
SINGLE PERCENT UNDER FOR SCREEN SIZE IN INCHES
CUMULATIVE PERCENT UNDER SCREEN SIZE IN INCHES

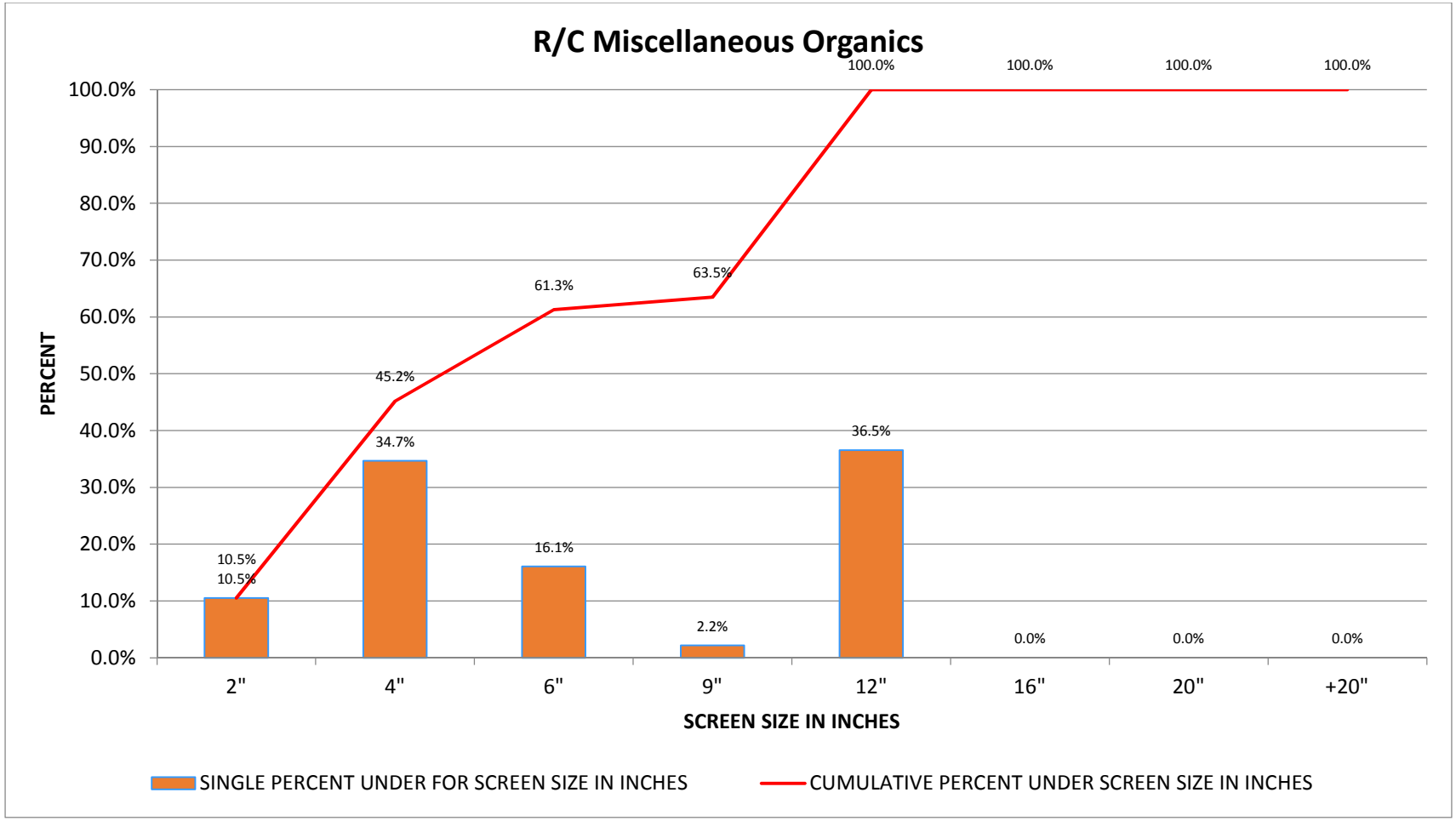

Branches/Twigs
100.0%
90.0%
80.0%
70.0%
60.0%
50.0%
40.0%
30.0%
20.0%
10.0%
0.0%
PERCENT
12.0%
12.0%
18.4%
6.3%
29.1%
10.8%
36.7%
7.6%
52.5%
15.8%
79.1%
26.6%
85.4%
6.3%
100.0%
14.6%
2"
4"
6"
9"
12"
16"
20"
+20"
SCREEN SIZE IN INCHES
SINGLE PERCENT UNDER FOR SCREEN SIZE IN INCHES
CUMULATIVE PERCENT UNDER SCREEN SIZE IN INCHES

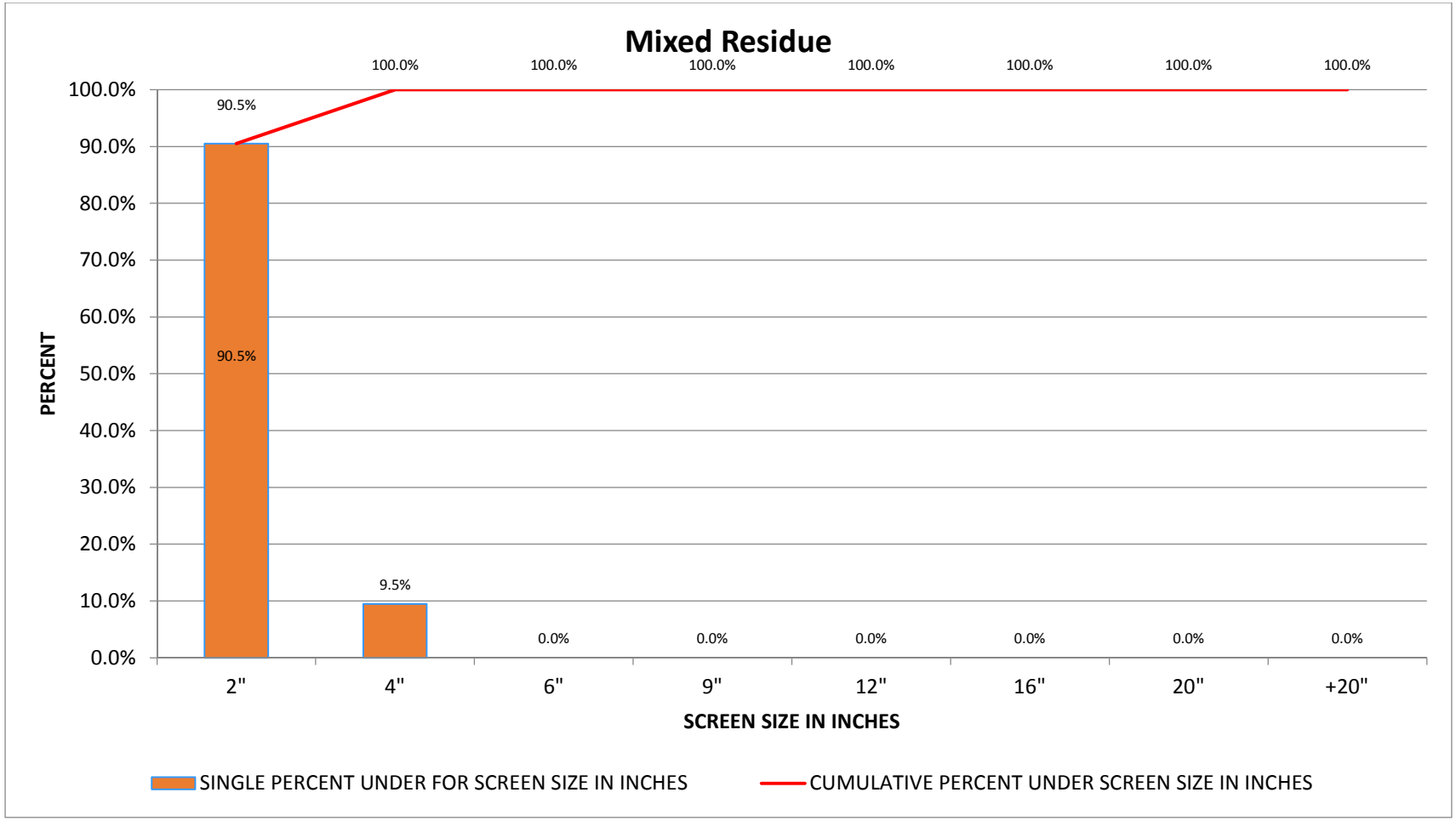

Untreated/Clean Wood
100.0%
90.0%
80.0%
70.0%
60.0%
50.0%
40.0%
30.0%
20.0%
10.0%
0.0%
PERCENT
7.2%
20.5%
40.2%
77.9%
100.0%
100.0%
100.0%
100.0%
7.2%
13.3%
19.7%
37.8%
22.1%
0.0%
0.0%
0.0%
2"
4"
6"
9"
12"
16"
20"
+20"
SCREEN SIZE IN INCHES
SINGLE PERCENT UNDER FOR SCREEN SIZE IN INCHES
CUMULATIVE PERCENT UNDER SCREEN SIZE IN INCHES

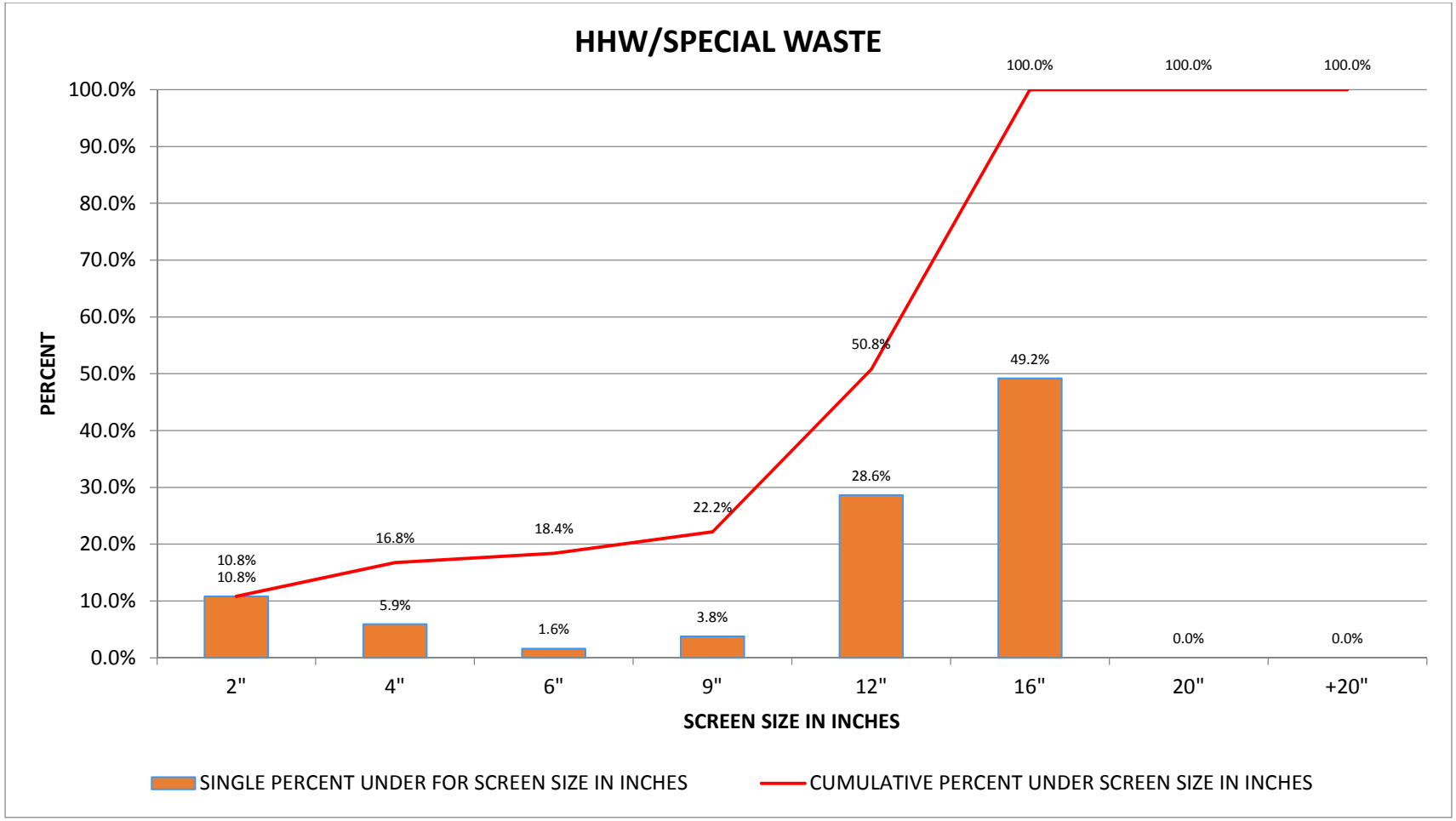

Food
100.0%
90.0%
80.0%
70.0%
60.0%
50.0%
40.0%
30.0%
20.0%
10.0%
0.0%
PERCENT
10.0%
10.0%
57.2%
47.3%
88.7%
31.5%
92.5%
3.8%
100.0%
7.5%
100.0%
0.0%
100.0%
0.0%
100.0%
0.0%
2"
4"
6"
9"
12"
16"
20"
+20"
SCREEN SIZE IN INCHES
SINGLE PERCENT UNDER FOR SCREEN SIZE IN INCHES
CUMULATIVE PERCENT UNDER SCREEN SIZE IN INCHES


Textiles & Leathers (Material #32)
100.0%
90.0%
80.0%
70.0%
60.0%
50.0%
40.0%
30.0%
20.0%
10.0%
0.0%
PERCENT
0.0%
0.0%
0.9%
0.9%
3.3%
2.4%
16.6%
13.3%
16.6%
0.0%
56.9%
40.3%
100.0%
43.1%
100.0%
0.0%
2"
4"
6"
9"
12"
16"
20"
+20"
SCREEN SIZE IN INCHES
SINGLE PERCENT UNDER FOR SCREEN SIZE IN INCHES
CUMULATIVE PERCENT UNDER SCREEN SIZE IN INCHES


Rubber
100.0%
90.0%
80.0%
70.0%
60.0%
50.0%
40.0%
30.0%
20.0%
10.0%
0.0%
PERCENT
100.0%
100.0%
100.0%
100.0%
100.0%
100.0%
78.9%
73.7%
21.1%
5.3%
5.3%
0.0%
0.0%
0.0%
0.0%
0.0%
2"
4"
6"
9"
12"
16"
20"
+20"
SCREEN SIZE IN INCHES
SINGLE PERCENT UNDER FOR SCREEN SIZE IN INCHES
CUMULATIVE PERCENT UNDER SCREEN SIZE IN INCHES


R/C Miscellaneous Organics
100.0%
90.0%
80.0%
70.0%
60.0%
50.0%
40.0%
30.0%
20.0%
10.0%
0.0%
PERCENT
10.5%
10.5%
34.7%
45.2%
16.1%
61.3%
2.2%
63.5%
36.5%
100.0%
0.0%
100.0%
0.0%
100.0%
0.0%
100.0%
2"
4"
6"
9"
12"
16"
20"
+20"
SCREEN SIZE IN INCHES
SINGLE PERCENT UNDER FOR SCREEN SIZE IN INCHES
CUMULATIVE PERCENT UNDER SCREEN SIZE IN INCHES


Mixed Residue
100.0%
100.0%
100.0%
100.0%
100.0%
100.0%
100.0%
90.5%
90.5%
9.5%
0.0%
0.0%
0.0%
0.0%
0.0%
0.0%
100.0%
90.0%
80.0%
70.0%
60.0%
50.0%
40.0%
30.0%
20.0%
10.0%
0.0%
PERCENT
2"
4"
6"
9"
12"
16"
20"
+20"
SCREEN SIZE IN INCHES
SINGLE PERCENT UNDER FOR SCREEN SIZE IN INCHES
CUMULATIVE PERCENT UNDER SCREEN SIZE IN INCHES


HHW/SPECIAL WASTE
PERCENT
100.0%
90.0%
80.0%
70.0%
60.0%
50.0%
40.0%
30.0%
20.0%
10.0%
0.0%
10.8%
10.8%
16.8%
5.9%
18.4%
1.6%
22.2%
3.8%
50.8%
28.6%
100.0%
49.2%
100.0%
0.0%
100.0%
0.0%
2"
4"
6"
9"
12"
16"
20"
+20"
SCREEN SIZE IN INCHES
SINGLE PERCENT UNDER FOR SCREEN SIZE IN INCHES
CUMULATIVE PERCENT UNDER SCREEN SIZE IN INCHES

Sunshine Canyon Landfill
Supplemental Waste Characterization
2015