California Integrated Waste Management Board

August 2009

Contractor's Report

To The Board

California 2008 Statewide Waste Characterization Study

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Executive Summary

Introduction and Objectives

The California Integrated Waste Management Board (Board) is acting on California's commitment to a zero waste goal in order to reduce greenhouse gases, conserve resources, and maintain California's unique natural environment. As part of the California Global Warming Solutions Act of 2006 (AB32), the Board is tasked with implementing waste management strategies to reduce the production of greenhouse gases. The move toward zero waste means reducing waste whenever possible. The Board has a role in directing all materials to their highest and best use, while protecting public health and safety and the environment. To realize these goals, the Board needs up-to-date information on the types and amounts of materials disposed in the state's waste stream.

In 2008, the Board commissioned a study on the types and amounts of materials disposed at solid waste facilities throughout the state. This study followed similar standards and protocols to those used in the statewide waste characterization study conducted in 2004. The first statewide study was done in 1999 and used a different methodology. As with the previous two studies, the present study estimates quantity and composition of the commercial, residential, and self-hauled waste streams in California and aggregates this data to estimate the overall composition.

The 2008 study incorporated several additional research and analysis tasks, including:

- A divertibility analysis to determine the extent and source of contamination on commonly recoverable paper, plastic, and metal materials found in disposed waste;
- A laboratory analysis of asbestos in roofing materials since the presence of asbestos could be of concern for recycling these materials;

Study Methodology

A stratified random sampling methodology was used to sample waste from numerous subgroups (strata) to develop a waste composition profile for each stratum. Strata considered in this study included the geographical region, the waste sector (residential, commercial, or self-hauled), and the waste subsector (single-family residential, multifamily residential, residential self-hauled, and commercial self-hauled). The strata were then "added together" in a way that reflects each stratum's relative contribution to the overall waste stream, thus producing overall waste composition information.

The state was divided into five regions defined by similarities in demographic, climatic, geographic, and economic characteristics. Data regarding waste composition were gathered from 751 waste samples sorted at 27 solid waste facilities (landfills and transfer stations) during four seasons. Whenever possible, a randomized process was used to select participating solid waste facilities, dates for field work, vehicles carrying waste, and multifamily dwellings. Approximately equal numbers of waste samples from each waste sector were obtained from each region of the state.

The sampled waste was sorted into 85 *material types*. In contrast, the detailed composition tables in the main body of the report are presented using the 62 Standard Material Types drawn from the California Integrated Waste Management Board's Uniform Waste Disposal Characterization Method. The expanded list of 85 *material types* used for sorting allows additional detail on

materials of interest, yet is designed to be "folded up" into the standard list used for presenting results in this study and to the Board. All *material types* were chosen and defined such that they can be compared to the *material types* used during California's 2004 Statewide Waste Characterization Study. These materials are described in Appendix B: List and Definitions of Material Types. Tables containing waste composition data using the expanded list are found in Appendix D: Expanded Statewide Waste Characterization Tables.

In addition, drivers at participating solid waste facilities were surveyed in order to determine the waste-generating sector and the net weight of each load, among other data. Results from these surveys were used to estimate the portion of California's waste derived from each waste sector and subsector. Surveys were conducted on the same days that waste was sampled, with an additional 15 survey-only days split across the four study seasons. On these days, vehicles bringing disposed waste to the site were surveyed, for a total of 6,896 surveys completed over the study period.

Results

The data gathered during the sampling efforts were compiled and statistical analyses were performed in order to extrapolate the findings to statewide estimates. This report includes detailed findings for the following areas:

- Disposed waste composition and tonnage for the state's overall waste stream and the commercial, residential, and self-hauled sectors, as well as the subsectors of single-family residential and multifamily residential waste and commercial self-hauled and residential self-hauled waste;
- Disposed waste tonnage for four waste-generating activities that comprise commercial self-hauled waste (construction, demolition, and remodeling activities; roofing activities; landscaping activities; and other commercial or industrial activities);
- A divertibility assessment of the levels of contamination and likely sources of contamination for commonly recoverable materials encountered in loads at solid waste facilities; and
- A laboratory assessment of the prevalence of asbestos in samples of material from roofing removal or replacement projects.

Table ES-1 depicts each sector's estimated contribution to the overall waste stream. Figure ES- 1 through Figure ES- 4 display the breakdown of the waste stream by 10 **Material Classes** for the overall waste stream and each of the three studied waste sectors. Table ES-2 presents the ten most prevalent *material types* in the overall disposed waste stream. Finally, Table ES-3 provides a detailed breakdown of the composition of the overall waste stream by material type.

Table ES-1: Estimated Contribution of Each Sector to California's Overall Disposed Waste Stream

Sector	Est. Percentage of Disposed Waste Stream	Est. Tons Disposed Statewide
Commercial	49.5%	19,672,547
Residential	30.0%	11,935,173
Single-family residential	*21.6%*	*8,583,746*
Multifamily residential	*8.4%*	*3,351,428*
Self-hauled	20.4%	8,115,098
Commercial self-hauled	*17.2%*	*6,812,464*
Residential self-hauled	*3.3%*	*1,302,634*
Totals	**100.0%**	**39,722,818**

Numbers may not total exactly due to rounding. Source: Individual facility records and 2008 vehicle survey findings applied to Board's Disposal Reporting System 2007 tonnage figures.

Figure ES- 1: Material Classes in California's Overall Disposed Waste Stream

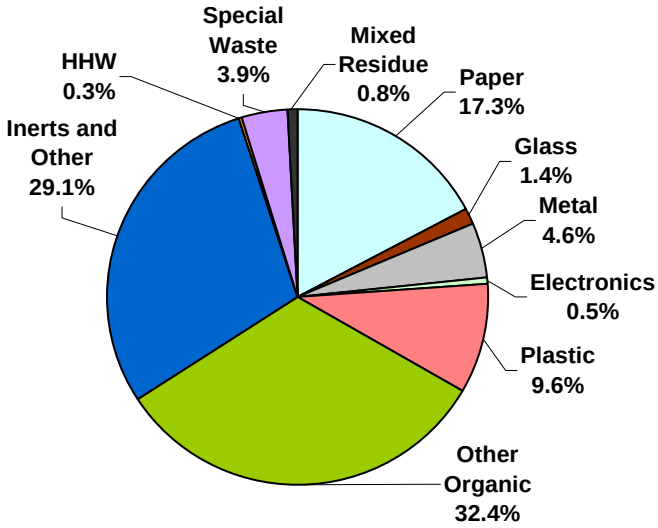


Figure ES- 2: Material Classes in the Commercial Disposed Waste Stream

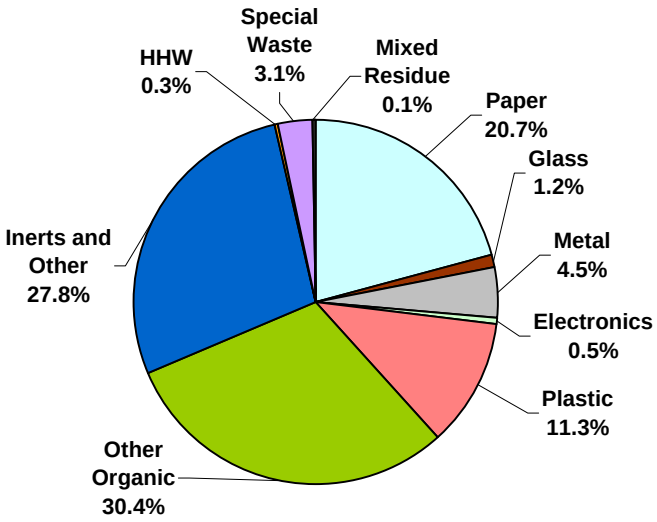


Figure ES- 3: Material Classes in the Residential Disposed Waste Stream

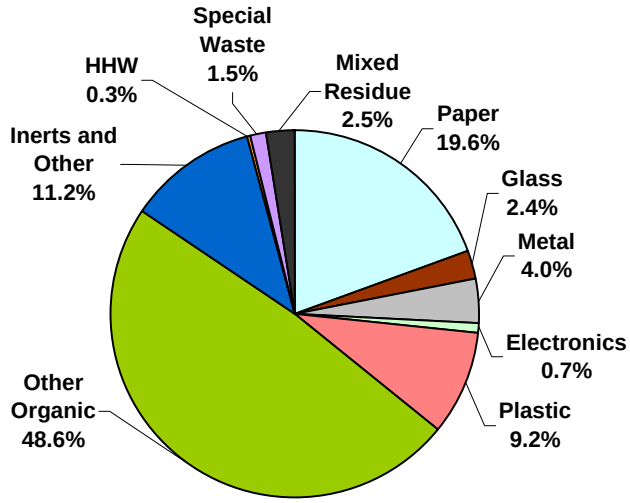
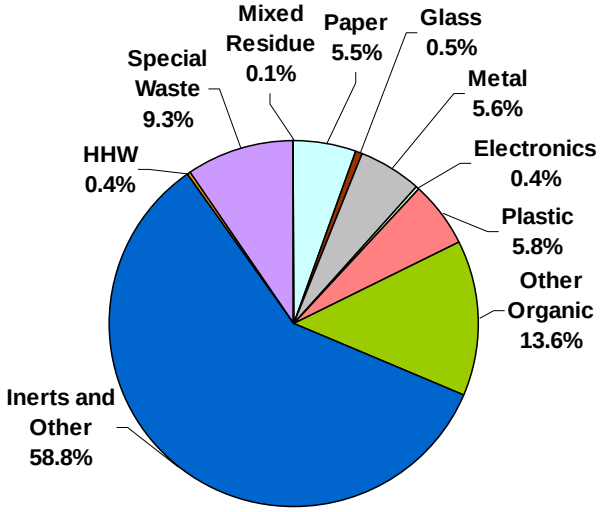


Figure ES- 4: Material Classes in the Self-hauled Disposed Waste Stream



Numbers may not total exactly due to rounding.

Table ES-2: Ten Most Prevalent Material Types in California's Overall Disposed Waste System

Material	Est. Percent	Cum. Percent	Est. Tons
Food	15.5%	15.5%	6,158,120
Lumber	14.5%	30.0%	5,765,482
Remainder/Composite Inerts and Other	5.5%	35.5%	2,175,322
Remainder/Composite Paper	5.2%	40.7%	2,056,546
Uncoated Corrugated Cardboard	4.8%	45.5%	1,905,897
Remainder/Composite Organic	4.3%	49.8%	1,719,743
Leaves and Grass	3.8%	53.6%	1,512,832
Bulky Items	3.5%	57.1%	1,393,091
Carpet	3.2%	60.3%	1,285,473
Rock, Soil and Fines	3.2%	63.5%	1,259,308
Total	**63.5%**		**25,231,814**

Any differences between *cumulative percent* figures and the sum of *estimated percent* figures are due to rounding. Note that the material type *remainder/composite inerts and other* includes such items as tiles, toilets, and fiberglass insulation. *Remainder/composite paper* includes such items as waxed corrugated cardboard, aseptic packages, paper towels, and photographs. Examples of *remainder/composite organic* include leather items, cork, garden hoses, carpet padding, and diapers.

Table ES-3: Composition of California's Overall Disposed Waste Stream by Material Type

Material	Est. Percent	+ / -	Est. Tons	Material	Est. Percent	+ / -	Est. Tons
Paper	**17.3%**		**6,859,121**	**Other Organic**	**32.4%**		**12,888,039**
Uncoated Corrugated Cardboard	4.8%	0.9%	1,905,897	Food	15.5%	1.9%	6,158,120
Paper Bags	0.4%	0.1%	155,848	Leaves and Grass	3.8%	0.7%	1,512,832
Newspaper	1.3%	0.3%	499,960	Prunings and Trimmings	2.7%	1.5%	1,058,854
White Ledger Paper	0.7%	0.3%	259,151	Branches and Stumps	0.6%	0.4%	245,830
Other Office Paper	1.2%	0.6%	472,147	Manures	0.1%	0.1%	20,373
Magazines and Catalogs	0.7%	0.2%	283,069	Textiles	2.2%	0.3%	886,814
Phone Books and Directories	0.1%	0.0%	24,149	Carpet	3.2%	2.0%	1,285,473
Other Miscellaneous Paper	3.0%	0.4%	1,202,354	Remainder/Composite Organic	4.3%	0.5%	1,719,743
Remainder/Composite Paper	5.2%	0.7%	2,056,546				
				Inerts and Other	**29.1%**		**11,577,768**
Glass	**1.4%**		**565,844**	Concrete	1.2%	0.4%	483,367
Clear Glass Bottles and Containers	0.5%	0.1%	196,093	Asphalt Paving	0.3%	0.4%	129,834
Green Glass Bottles and Containers	0.2%	0.1%	79,491	Asphalt Roofing	2.8%	1.5%	1,121,945
Brown Glass Bottles and Containers	0.3%	0.1%	108,953	Lumber	14.5%	2.2%	5,765,482
Other Colored Glass Bottles and Containers	0.1%	0.0%	40,570	Gypsum Board	1.6%	0.7%	642,511
Flat Glass	0.1%	0.1%	33,899	Rock, Soil and Fines	3.2%	1.1%	1,259,308
Remainder/Composite Glass	0.3%	0.1%	106,838	Remainder/Composite Inerts and Other	5.5%	1.3%	2,175,322
Metal	**4.6%**		**1,809,684**	**Household Hazardous Waste (HHW)**	**0.3%**		**120,752**
Tin/Steel Cans	0.6%	0.1%	236,405	Paint	0.1%	0.1%	48,025
Major Appliances	0.0%	0.1%	17,120	Vehicle and Equipment Fluids	0.0%	0.0%	6,424
Used Oil Filters	0.0%	0.0%	3,610	Used Oil	0.0%	0.0%	3,348
Other Ferrous	2.0%	0.4%	801,704	Batteries	0.0%	0.0%	19,082
Aluminum Cans	0.1%	0.0%	47,829	Remainder/Composite Household Hazardous	0.1%	0.1%	43,873
Other Non-Ferrous	0.2%	0.1%	84,268				
Remainder/Composite Metal	1.6%	0.5%	618,747	**Special Waste**	**3.9%**		**1,546,470**
				Ash	0.1%	0.1%	40,736
Electronics	**0.5%**		**216,297**	Treated Medical Waste	0.0%	0.0%	0
Brown Goods	0.2%	0.1%	76,725	Bulky Items	3.5%	1.2%	1,393,091
Computer-related Electronics	0.1%	0.1%	32,932	Tires	0.2%	0.1%	60,180
Other Small Consumer Electronics	0.1%	0.0%	34,588	Remainder/Composite Special Waste	0.1%	0.1%	52,463
Video Display Devices	0.2%	0.1%	72,053				
				Mixed Residue	**0.8%**		**330,891**
Plastic	**9.6%**		**3,807,952**	Mixed Residue	0.8%	0.2%	330,891
PETE Containers	0.5%	0.1%	199,644				
HDPE Containers	0.4%	0.1%	157,779				
Miscellaneous Plastic Containers	0.4%	0.1%	163,008				
Plastic Trash Bags	0.9%	0.1%	361,997				
Plastic Grocery and Other Merchandise Bags	0.3%	0.0%	123,405				
Non-Bag Commercial and Industrial Packaging Film	0.5%	0.2%	194,863				
Film Products	0.3%	0.2%	113,566				
Other Film	1.4%	0.3%	554,002				
Durable Plastic Items	2.1%	0.4%	834,970	**Totals**	**100.0%**		**39,722,818**
Remainder/Composite Plastic	2.8%	0.7%	1,104,719	**Sample Count**	**751**		

Confidence intervals calculated at the 90% confidence level. Percentages for material types may not total 100% due to rounding.
More detailed composition tables can be found in Appendix D: Expanded Statewide Waste Characterization Tables

Overall Key Findings

- The findings show that, statewide, the commercial sector produces 50 percent of the disposed waste stream, and the residential sector (single-family plus multifamily) produces 30 percent. The self-hauled sector represents the remaining 20 percent.
- **Inerts and Other** materials account for nearly one-third (29 percent) of the statewide disposed waste stream, with *lumber* representing nearly 15 percent of disposed waste.
- Compostable materials, including food and vegetative materials, account for more than 20 percent of the statewide disposed waste stream. Of these, *food* is the largest component, comprising nearly 16 percent of disposed waste.
- Paper and fiber materials represent slightly more than 17 percent of disposed waste, with *uncoated corrugated cardboard* being the most prevalent recyclable material and representing more than one-quarter of the paper and fiber that is disposed.

Additional Research and Analysis Key Findings

- The divertibility analysis indicates that nearly two-thirds of the commonly recycled types of paper, plastic, and metal materials found in disposed waste are uncontaminated at the time they arrive at disposal facilities.
- Of the 191 roofing samples collected and analyzed, just one sample of *roofing mastic* was found to contain traces of asbestos.
- The detailed analysis of *material types* found that of all PETE plastic containers disposed, 26 percent are water bottles of one liter or less in size. More than half of all roofing materials disposed consist of *asphalt composition shingles.* In the overall *lumber* type, 37 percent is *clean dimensional lumber* or *clean pallets and crates*.
- Detailed sorting of plastic carryout bags to determine sources (related to a statewide plastic bag recycling program) showed that 44 percent of bags disposed are from grocery stores.

Comparison with 2004 Statewide Waste Characterization Study

- The proportions of the waste stream contributed by the commercial, residential, and self-hauled sectors remained about the same.
- The largest change in the overall waste stream composition is an increase, from 22 percent to 29 percent, in the **Inerts and Other** category (formerly the **Construction and Demolition** category). This is largely due to an increase in disposal of *lumber*.
- In the commercial sector, disposal of **Paper**, **Glass**, and **Metal** decreased while **Inerts and Other** increased, again mainly due to increased disposal of *lumber*.
- Food waste increased from 17 percent to 25 percent of all residential waste disposed. The disposed tonnage of **Paper**, **Glass**, and **Metal** decreased.
- Overall per capita disposal decreased slightly from 1.11 to 1.06 tons per person per year (calculated by dividing tons of all disposed municipal solid waste by total population). Residential per capita disposal decreased from 0.35 to 0.32 tons per resident per year (calculated by dividing all disposed residential waste by total population).

Introduction and Overview

California has committed to a zero waste goal to reduce greenhouse gases, conserve resources, and maintain California's unique natural environment. To achieve this goal, local governments, industries, and the public each must take responsibility for their contribution of the estimated 93 million tons of waste generated each year in California. As part of the California Global Warming Solutions Act of 2006 (AB32), the Board is tasked with implementing waste management strategies to reduce the production of greenhouse gases. The move toward zero waste means reducing waste whenever possible. The California Integrated Waste Management Board (Board) has a role in directing all materials to their highest and best use, while protecting public health and safety and the environment.

With up-to-date information on the types and amounts of materials disposed in the state's waste stream, the Board can better determine where changes are needed to achieve California's zero waste goal. These data are essential for solid waste planning, assessment of waste diversion activities, market development for recovered materials, and charting progress toward climate impact goals. Through periodic studies, the Board can track California's ever-changing waste stream while gathering new information on materials of concern as they are identified. Data generated from these studies are critical for several reasons:

- An accurate appraisal of recyclable materials in the disposed waste stream can ensure that diversion goals are both reasonably set and effectively reached and that recyclable materials are being directed to their highest and best uses;
- Reducing the amount of bulky and biodegradable organic materials from the disposed waste stream is an effective way of reducing greenhouse gas emissions while extending the life of landfills; and
- Household hazardous waste, electronic waste, and other types of special waste are constantly fluctuating with the changing list of goods on the market. The impact of these wastes on the natural environment is of constant concern. Staying abreast of these materials and current ways of handling them is of utmost importance for a healthy California.

The Board contracted with Cascadia Consulting Group to characterize and quantify the current statewide waste stream in 2008. This report presents the findings of the 2008 Statewide Waste Characterization Study.

Relation to the Previous Studies

Cascadia previously conducted statewide waste characterization studies in 1999, 2004, and 2006. The 1999 study developed a comprehensive set of baseline estimates of the quantity and composition of disposed municipal solid waste statewide, and it included detailed examination of disposed waste for individual industry groups within the commercial sector. The 2004 study, like the present study, also developed comprehensive estimates of the statewide disposed waste stream, without the more detailed examination of individual industry groups. In 2006, four specific portions of the waste stream were studied in depth, and a major focus of the 2006 study was to examine disposal and recycling practices of certain industry groups even more closely. Thus, the findings of the present study are most directly comparable to those of the 2004 statewide study and are also comparable to parts of the 1999 statewide study.

The primary objectives of the 2004 and 2008 projects were to characterize and quantify the residential, commercial, and self-hauled sectors of the disposed waste stream at the statewide level. The 2004 study characterized a total of 550 samples, while the 2008 study characterized 751 samples. Table 1 provides the sample allocations by sector and subsector for both years.

Table 1: Numbers of Waste Samples Characterized, by Sector and Subsector, 2004 vs. 2008

Sector	Number of Samples: 2004	Number of Samples: 2008
Commercial	200	250
Residential	150	251
Single-family residential	*110*	*201*
Multifamily residential	*40*	*50*
Self-hauled	200	250
Commercial self-hauled	*133*	*139*
Residential self-hauled	*67*	*111*
Total	**550**	**751**

The 2008 study incorporated several additional inquiries:

- A divertibility analysis to determine the rate and source of contamination on commonly recoverable paper, plastic, and metal materials;
- A laboratory analysis of asbestos in roofing materials;
- Detailed sorting of plastic bags to determine sources, in relation to a statewide plastic bag recycling program;
- Additional vehicle surveys to quantify the amount of waste from C&D activities; and
- Additional vehicle surveys at large facilities. To quantify waste from each sector, vehicles bringing waste to facilities used in the study were surveyed to determine the sector of origin. In all past Board studies, facilities were selected in each region randomly. But with random selection large facilities may be completely missed, and large amounts of tonnage in the region may not be represented in the study. To address this, additional large facilities were included in the study for vehicle surveys only, in order to compare sector tonnages estimated using data from randomly selected facilities with that from deliberately chosen large sites.

In order to allow comparisons between the 2004 and 2008 studies, every effort has been taken to ensure consistency in study methodology and presentation of findings from 2004 to 2008.

In the interest of clarity, the Board has changed the **Material Class** name **Construction and Demolition,** used in previous studies, to **Inerts and Other** for the 2008 study. The **Inerts and Other** tonnage represents only a portion of the total statewide disposal of material from all construction and demolition (C&D) activities. Data from the two **Material Classes** are still directly comparable.

Objectives and General Methodology of the 2008 Study

The primary objectives of this project were to characterize and quantify the residential, commercial, and self-hauled sectors of the disposed waste stream at the statewide level. Part of this effort involved examining important subsectors of the disposed waste stream including single-family residential and multifamily residential waste, residential self-hauled waste, and self-hauled waste generated by several common commercial activities.

Waste was sampled using a stratified random sampling methodology. Waste was sampled from numerous subgroups (strata such as geographical region and waste sector) to develop a waste composition profile for each stratum. The strata were then "added together" in a way that reflects each stratum's relative contribution to the overall waste stream, thus producing overall waste composition information.

The remainder of this section outlines the planning and data collection strategies implemented during this study. The planning phase included:

- Identifying the regions of the state to be visited;
- Defining the waste sectors to be examined during the study;
- Recruiting and scheduling solid waste disposal sites statewide for surveying and sampling; and
- Selecting the *material types* to be examined throughout the study.

The data-collection phase included:

- Determining the composition of the waste stream through sampling and sorting;
- Quantifying the waste stream through vehicle surveys; and
- Conducting additional research and analysis tasks including a divertibility study and an analysis of asbestos in roofing materials.

Identifying Regions

For the purposes of this study, the state was divided into five regions, as shown in Figure **1**. Regions were delineated based upon certain shared characteristics, such as demographics, climate, geography, and economics. The assignment of individual counties to regions is identical to the approach used in the 2004 Statewide Waste Characterization Study and can be found in Appendix A: Detailed Methodology. In general, the regions can be characterized as follows:

- **Bay Area:** Includes the counties in the San Francisco Bay Area, which are generally more metropolitan than counties in other regions and have strong industrial components in the economy;
- **Coastal:** Includes the counties on the coast that are not in either the Bay Area or Southern regions. The coastal region is more populated than the rural mountain region and has a large agricultural component similar to the Central Valley;
- **Mountain:** Includes counties mainly in the eastern part of the state that are primarily rural with strong agricultural economies, low population density, and a low industrial base;

- **Southern:** Includes counties in the southern part of the state that are strongly industrial with large populations and some agricultural influences; and
- **Central Valley:** Includes counties between the Sierra Nevada Mountains and the Coast Range that have a major agricultural base with important population centers and some manufacturing.

Figure 1: Regions Considered in the Study

Defining Waste Sectors

In each of the five regions, waste was characterized for the three sectors, four subsectors, and four activities, as shown in Figure 2 below.

Figure 2: Overview of Waste Disposal Sectors and Subsectors

Sector Subsector *Activity*	**Description**
Commercial waste	**Waste disposed by businesses, industries (e.g., factories, farms), institutions, and governments (e.g., schools, highways, parks) that is collected and transported by contracted and franchised haulers**
Residential Waste	**Waste disposed by households that is collected and transported by contracted and franchised haulers**
Single-family residential waste	Waste that is collected from either single-family residences or buildings that include no more than four living units
Multifamily residential waste	Waste that is collected from multi-unit buildings with greater than four living units
Self-hauled waste	**Waste hauled by individuals, businesses, or government agencies that haul their own garbage; includes waste delivered by anyone other than a contracted or franchised hauler**
Commercial self-hauled waste	Waste that is hauled to a disposal site by a commercial enterprise (e.g., landscaper, contractor) even if waste is from residential dwellings
Construction, demolition, and remodeling waste	*Waste generated during the construction, demolition, or remodeling of buildings by construction professionals*
Roofing waste	*Waste generated during the installation or replacement of roofs, including tear-off, by roofing professionals*
Landscaping waste	*Waste generated as part of landscaping and other yard care activities by landscaping professionals*
Other commercial and industrial self-hauled waste	*All waste generated at businesses or institutions and hauled by these businesses that is not construction, remodeling, demolition; landscaping; or roofing waste*
Self-hauled residential waste	Waste that is hauled to a disposal site by a resident from his or her home

Scheduling Sites

Once the study regions and sectors were defined, solid waste facilities in each region were randomly selected for sampling and surveying from a comprehensive list of landfills and transfer stations throughout the state. Potential sites were eliminated from the list if they did not meet certain minimum criteria, as follows:

1. The site must accept waste that is destined for final disposal. For a landfill, this would mean waste that is to be buried; for a transfer station, waste that is not subjected to any separation or diversion techniques.
2. The site must accept waste from all three waste sectors (commercial, residential, and self-hauled) in quantities that would allow a predetermined sampling quota to be met.
3. The site must not only grant permission to perform sampling and sorting but must be able to provide a safe and logistically sensible space in which to work.
4. The site must receive an average of at least 100 tons of incoming disposed waste per day.[1]

Five facilities from each region agreed to participate in the study, for a total of 25 facilities. During each season, 12 or 13 facilities were visited (two to three per region). Each facility was visited twice, with visits to an individual facility staggered by approximately six months. Small rural facilities were usually visited for two days for each sorting event to ensure that adequate numbers of samples and gate surveys were obtained. During the course of the study, two original facilities had to be replaced due to logistical difficulties, so a total of 50 sampling visits were made to 27 facilities. Appendix A: Detailed Methodology contains a list of all facilities visited for sampling. The sampling dates were as follows:

- Winter: Jan. 14-29, 2008;
- Spring: April 8-24, 2008;
- Summer: July 16-31, 2008;
- Autumn: Nov. 6-21, 2008.

Appendix A: Detailed Methodology contains a thorough description of the selection and screening procedures.

[1] This requirement was waived for the mountain region as few, if any, of the facilities in that region average 100 tons per day.

Selecting Material Types

Waste samples were sorted and characterized according to 85 *material types*, as described in Appendix B: List and Definitions of Material Types. The 85 *material types* are organized into 10 **Material Classes** as follows:

- 11 types of **Paper**
- Six types of **Glass**
- Seven types of **Metal**
- Five types of **Electronics**
- 17 types of **Plastic**
- Eight types of **Other Organic** waste
- 15 types of **Inerts and Other** waste
- Nine types of **Household Hazardous Waste (HHW)**
- Six types of **Special Waste**
- One type of **Mixed Residue**.

Fewer *material types* were characterized in this study than in 2004, when 98 *material types* were characterized. The primary reason for this decrease is that the 2004 study involved a special assessment of California Redemption Value (CRV) and Rigid Plastic Packaging Containers (RPPC), not included in the 2008 study. Other notable changes include the following:

- The name of the class **Construction and Demolition** was changed to **Inerts and Other** to better reflect the fact that this category does not represent all or only materials disposed from construction and demolition (C&D) activities;
- The number of **Inerts and Other** materials increased from seven to 15, including an expanded list of wood and roofing *material types;*
- The number of **HHW** materials increased from five to nine, including the addition of *sharps, pharmaceuticals, fluorescent lights and other mercury-containing items,* and *lead-acid (automotive) batteries;* and
- *Sewage solids* and *industrial sludge* were removed from the 2008 **Special Waste** class since these materials are not typically encountered in standard waste characterization studies.

These changes reflect the changes in data needs as new *material types* come into focus, but maintain consistency with past studies so that data can be compared over time.

Though samples were sorted into 85 *material types*, composition results are presented in the main body of this report according to the Board's 62 item Standard List of Material Types for Waste Sorting. The expanded list provides more detail and helps direct Board efforts towards zero waste. Detailed composition tables displaying all 85 materials can be found in Appendix D: Expanded Statewide Waste Characterization Tables. All changes made to the 2008 materials list allow comparisons to be made between the lists used in the 1999 and 2004 studies. Appendix B:

List and Definitions of Material Types contains both the condensed and expanded material lists and definitions for all materials.

Determining the Composition of the Waste Stream

Samples of disposed waste from the single-family residential, commercial, commercial self-hauled, and residential self-hauled sectors were captured at selected solid waste facilities (landfills or transfer stations) in each region and subjected to a hand-sorting separation process. Samples from the multifamily residential sector were collected straight from the dumpsters at apartment buildings and complexes rather than at solid waste facilities. This allowed for more detailed analysis of the multifamily waste stream.

Figure 3: Hand-Sorting Waste Sample

The sampling and sorting process produced data on the amount of each material in each sample. This data was then aggregated and subjected to statistical analysis to assess the composition (the relative percentage of each material) of each waste sector, and ultimately the entire waste stream. Samples associated with each waste sector and subsector were apportioned equally among facilities and regions. Table 2 shows the number of samples that were collected for each sector.

Table 2: Numbers of Waste Samples Characterized, by Sector and Subsector

Sector	Number of Samples
Commercial	250
Residential	251
Single-family residential	*201*
Multifamily residential	*50*
Self-hauled	250
Commercial self-hauled	*139*
Residential self-hauled	*111*
Total	**751**

See Appendix A: Detailed Methodology for a detailed account of planned and actual waste samples and Table 42 for the distribution of samples among facilities. Generally, samples were distributed evenly among seasons and regions.

In addition to standard waste characterization, commonly recoverable materials in approximately one in four of the samples were assessed to determine their rate and point of contamination. A count of the number of samples analyzed for contamination from each sector is presented in Table 3 and in greater detail in Appendix A: Detailed Methodology.

Table 3: Numbers of Samples Assessed for Contamination, by Sector and Subsector

Sector	Number of Samples
Commercial	75
Residential	72
Single-family residential	*57*
Multifamily residential	*15*
Self-hauled	47
Commercial self-hauled	*19*
Residential self-hauled	*28*
Total	**194**

Quantifying the Waste Stream

To determine how many tons of disposed waste were associated with each of the waste sectors, subsectors, and activities, drivers were surveyed concurrently with sampling and sorting activities at participating facilities.

Figure 4: Surveying a Self-hauled Vehicle

Vehicle surveys were conducted on each sampling day, as well as for an additional 15 days, at sites selected and distributed across the five regions. An extra day of surveying was added for each sampling event at small rural sites since vehicle traffic is typically very light at these sites. Over the course of the study, 6,896 vehicle surveys were completed. Table 4 shows the number of vehicle surveys completed by region and by season. Appendix A: Detailed Methodology includes a list of survey-only facilities.

Table 4: Vehicle Survey Responses, by Region and Season

Season	Bay Area	Coastal	Mountain	Southern	Valley	Totals
Winter 2008	559	78	450	314	234	**1,635**
Spring 2008	577	177	307	495	290	**1,846**
Summer 2008	187	291	357	744	380	**1,959**
Autumn 2008	473	346	173	200	264	**1,456**
Totals	**1796**	**892**	**1287**	**1753**	**1168**	**6,896**

The survey data, in conjunction with daily transaction reports and annual tonnage reports from facilities, were used to estimate the fraction of the overall waste stream disposed from each of the waste sectors, subsectors, and activities at each participating facility. The Board provided annual disposed tonnage figures, by region and statewide, which allowed these estimated percentages to be converted into annual tonnages for each sector at the regional and statewide levels. Appendix A: Detailed Methodology describes how this information was then used to estimate the relative magnitude of each part of the disposed waste stream on a regional basis and statewide. Copies of the survey forms are included in Appendix C: Forms Used in the Study.

Incorporating Additional Research and Analysis Tasks

Besides characterizing and quantifying the residential, commercial, and self-hauled sectors of the disposed waste stream, this study also took a closer look at some specific *material types* through the following additional research and analysis tasks.

Divertibility Analysis

Commonly recoverable materials were visually assessed in approximately one in four of the samples to determine the level and point at which contamination occurred, either before the material was disposed or during transport in a solid waste vehicle. The materials assessed were then sorted and weighed to determine amounts contaminated at the different points. This was a general assessment of contamination and did not include cleaning materials and re-weighing them to get numerical amounts of contamination for each material type.

Laboratory Analysis of Asbestos in Roofing Loads

To measure the incidence of asbestos-containing materials in disposed roofing, samples of composition shingles, tar paper/felt, roofing mastic, built-up roofing, and other asphalt roofing material were collected and tested for asbestos by an independent accredited laboratory using polarized light microscopy.

Details on Plastic Grocery and Other Merchandise Bags

Recent legislation in California requires implementation of a statewide plastic bag recycling program for large grocery stores and pharmacies. In order to get more detailed data on disposal of these bags, *plastic grocery and other merchandise bags* was further sorted to identify bags from grocery stores, pharmacies, and other sources.

Statewide Characterization Results

This section presents vehicle survey results for statewide tonnages by sector and detailed characterization results for the overall disposed waste stream as well as for the residential, commercial, and self-hauled waste sectors.

Interpreting the Results

How Data Is Presented

For the overall disposed waste stream, and for each waste sector and subsector, data are presented in three ways:

- First, an overview of waste composition by broad **Material Class** is presented in both pie chart and tabular formats.
- Next, the 10 most prevalent individual *material types*, by weight, are shown in a table.
- Finally, a detailed table lists the full composition and quantity results for the 62 standard *material types*. Refer to Appendix B: Expanded and Standard List of Material Types for a comparison between the 2008 and 2004 standard *material types* and a detailed list of material definitions used in the study. Tables containing data for the 85 expanded *material types* can be found in Appendix D: Expanded Statewide Waste Characterization Tables.

Means and Error Ranges

The data from the sorting process were treated with a statistical procedure that provided two kinds of information for each of the *material types*:

- The percent-by-weight estimated composition of waste represented by the samples examined in the study; and
- The degree of precision of the composition estimates.

All estimates of precision were calculated at the 90 percent confidence level. The equations used in these calculations appear in the section *Description of Calculations and Statistical Procedures Used* in Appendix A: Detailed Methodology.

The example below illustrates how the results can be interpreted. In this example, the best estimate of the amount of *leaves and grass* present in the universe of waste sampled is 3.8 percent. The figure 0.7 percent reflects the precision of the estimate. When calculations are performed at the 90 percent confidence level, we are 90 percent certain that the true amount of *leaves and grass* is between 3.8 percent plus 0.7 percent and 3.8 percent minus 0.7 percent. In other words, we are 90 percent certain that the mean lies between 4.5 percent and 3.1 percent.

Material Type	Est. Pct.	+ / -
Leaves and grass	3.8%	0.7%

Rounding

When interpreting the results presented in the tables and figures in this report, it is important to consider the **effect of rounding**.

To keep the waste composition tables and figures readable, estimated tonnages are rounded to the nearest ton, and estimated percentages are rounded to the nearest tenth of a percent. Due to this rounding, the **tonnages** presented in the report, when added together, may not exactly match the subtotals and totals shown. Similarly, the **percentages**, when added together, may not exactly match the subtotals or totals shown. Percentages less than 0.05 percent are shown as 0.0 percent.

It is important to recognize that the tons shown in the report were calculated using the more precise percentages. Therefore, using the rounded percentages to calculate tonnages yields quantities that are less precise than those shown in the report.

For example, the rounded percentage for *lumber* in Table 7 is shown as 14.5 percent of the disposed substream, while the more precise percentage was 14.5142815944385 percent. If the rounded percentage for *lumber* in Table 7 were used to calculate the tonnage, it would yield the following: 14.5 percent x 39,722,818 (the total tonnage) = 5,759,809 tons. However, if the more precise percentage for this material is used, it yields the following: 14.5142815944385 percent x 39,722,817.79 (the total tonnage) = 5,765,481.6312863 tons, or 5,765,482 tons when rounded to the nearest ton. The more precise tonnage of 5,765,482 is used in the table.

All confidence intervals were derived using a 90 percent confidence level, meaning that there is a 90 percent certainty that the actual composition is within the calculated range. In charts throughout this report, the values graphed represent the mean component percentage, not the range.

Infrequent Material Types

Composition estimates for certain materials have a higher degree of uncertainty because the materials are infrequently disposed, and, consequently, appear infrequently in samples. Examples of such materials include *paint, sharps, tires,* and *ash*. Because the composition results are based on few instances of these materials, the results are less certain, as shown by the relatively large confidence intervals. As an example, *tires* are estimated to comprise 0.2 percent of the overall disposed stream with a 0.1 confidence interval. In other words, *tires* may comprise 50 percent more or 50 percent less of the waste stream than their best estimate (0.2 percent). Small, lightweight materials that appear frequently in samples also comprise a small percentage of the overall composition. These frequently found materials, in contrast, have smaller relative confidence intervals. An example is *PETE containers*, which comprise a small percentage of the overall waste stream (0.5 percent) and have a relatively small confidence interval (0.1 percent).

Material Class Change: Construction and Demolition now Inerts and Other

In the 2008 study, the **Material Class** formerly known as **Construction and Demolition** is re-named **Inerts and Other**. The new **Inerts and Other** class is directly comparable with the **Construction and Demolition** class from previous waste characterization studies in every way. The Board saw reason to change the name of this **Material Class** because this category represents neither all nor only materials created during C&D activities. Specifically:

- The data in this class reflect the total amounts of these *material types* in the overall disposed waste stream, regardless of the activity generating the material. For example, the *lumber* material type would include wood scraps from a home craft project that were disposed in a residential garbage can, or a pallet that a business disposed in its Dumpster. These materials were not generated by C&D activities, but they fall under the *lumber* material type in the **Inerts and Other** class.

- C&D activities generate other materials in addition to those listed under the **Inerts and Other** class, such as *cardboard*, *ferrous metal*, and *plastic film*. These materials are counted under the **Paper**, **Metal**, and **Plastic** classes respectively, even though they were generated by C&D activities.
- A separate survey conducted as part of this study estimated that 16 percent of the statewide disposed waste stream consists of materials from C&D activities.

In sum, the amounts of materials listed previously in the **Construction and Demolition** class could not be used as an estimate of the total amount of waste disposed from all C&D activities in California. The *2006 Detailed Characterization of Construction and Demolition Waste* study characterized and quantified C&D waste as a separate waste stream.

New Presentation of Organics Data

The Board's standard material type list splits materials that are of interest for organics recycling between the **Other Organic** and the **Inerts and Other** classes. Table 29 has been included at the end of this section which groups the typically compostable/recyclable organic materials together – food waste, yard waste, manure, and certain types of wood waste.

Statewide Tonnages by Sector

Vehicle surveys are used to apportion tons between the various sectors, subsectors, and activities included in this study. Table 5 shows the estimated disposed tonnage from each sector and subsector of the waste stream.

Table 5: Estimated Contribution of Each Sector to California's Overall Disposed Waste Stream

Sector	Est. Percentage of Disposed Waste Stream	Est. Tons Disposed Statewide
Commercial	49.5%	19,672,547
Residential	30.0%	11,935,173
Single-family residential	*21.6%*	*8,583,746*
Multifamily residential	*8.4%*	*3,351,428*
Self-hauled	20.4%	8,115,098
Commercial self-hauled	*17.2%*	*6,812,464*
Residential self-hauled	*3.3%*	*1,302,634*
Totals	**100%**	**39,722,818**

Numbers may not total exactly due to rounding.

Commercial and residential waste includes all waste collected and transported to solid waste sites by contracted and franchised waste haulers from commercial or residential sources. Self-hauled waste includes both commercial and residential wastes that are hauled by anyone other than a contracted or franchised hauler (e.g., an individual homeowner, a construction company, a landscaper). For the purposes of this study, commercial self-hauled loads were those hauled by a

commercial enterprise (e.g., contractor, landscaper) even if the source of the waste was a residential dwelling. Residential self-hauled loads were those loads transported by a resident from their home to the solid waste site.

The facilities used for composition sampling and the accompanying vehicle surveys were selected randomly in order to be comparable to past studies. Then for each region, an additional three facilities were selected from a pool of the largest facilities in the region. These large facilities were surveyed once during the study.

Vehicle survey data collected during the study were grouped in several ways and then analyzed to estimate statewide proportions of waste from each sector: randomly chosen sites only (as done in past studies), the largest five sites in each region (includes randomly-chosen sites as well as deliberately-chosen large), and all sites.

The results from the three analyses differed significantly. A closer examination of the data was made to investigate these differences. Using data from all facilities probably gives the best estimate at the statewide level simply because it is a larger body of data, representing more tonnage surveyed. In looking at data from all the sites, one particular very large site stood out. This one landfill, the largest in the state, received 3.6 million tons of waste in 2007—9 percent of the entire state's waste. This tonnage represented 46 percent of the waste surveyed in the region, and the southern region represents 62 percent of the state's disposed waste. Almost half of the waste received at this landfill was from the self-hauled sector—an unusually high amount compared to most other facilities in the study. Therefore, when gate survey data were aggregated, this one site had a very large influence on the statewide estimate that skewed the sector proportions toward self-hauled waste.

To address this, the sector tonnage estimates for the southern region were calculated without this site, which was treated as a separate entity. The sector estimates for the large landfill were then added back in to the region to get the final estimates of tons from each sector for the southern region. Then data from each region were aggregated up to the statewide level according to the usual protocol. Therefore the sector tonnage estimates for this study were made using a different method than the 2004 study (more sites, some large ones chosen deliberately, and adjustments made), but are considered to be the most accurate representation for the state.

Single-family and multifamily residential waste together account for 30 percent of the state’s waste stream. Commercial waste is the largest substream, comprising 50 percent of the state’s waste stream. Overall, the per-capita disposal rate for the state was approximately 1.06 tons per person per year in 2007. It should be noted that per-capita disposal rates include all waste disposed at landfills, including that from industrial, institutional, and construction and demolition sources. Other states and federal agencies may define municipal solid waste differently from California. The per-capita disposal rate for residential waste (single-family and multifamily) was approximately 0.32 tons per person per year. The average per unit disposal rate for the multifamily subsector was 0.96 tons per unit per year.

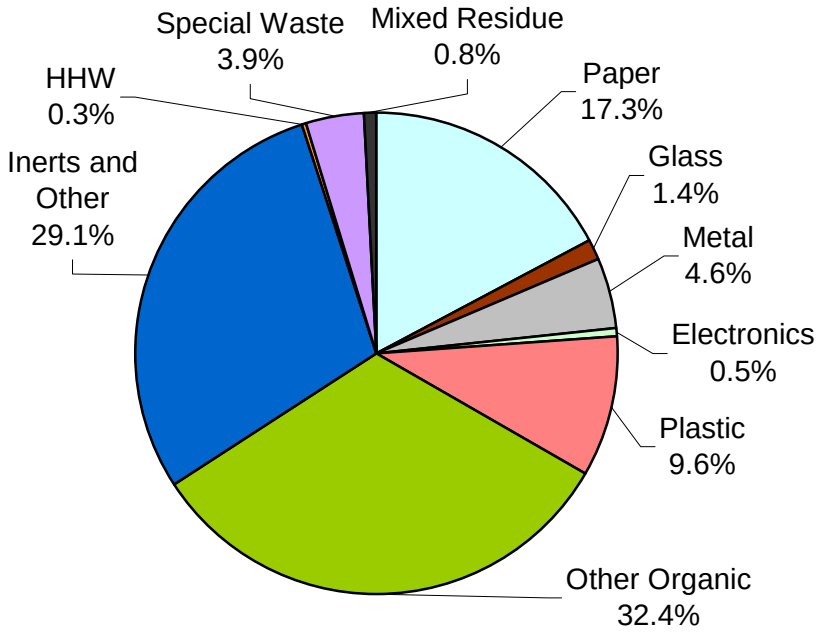
Overall Disposed Waste Stream

The objective of this portion of the study was to characterize the overall disposed municipal solid waste stream for the entire state of California, combining all of the sectors and subsectors considered elsewhere in this study.

Overview and Analysis

Composition estimates by **Material Class** for the overall waste stream are illustrated in Figure 5. The largest **Material Class** in the overall waste stream was **Other Organic** which accounted for nearly one third (32 percent) of the waste stream, by weight, followed by **Inerts and Other** (29 percent) and **Paper** (17 percent).

Figure 5: Overview of California's Overall Disposed Waste Stream



Material Class	Est. Percent
Paper	17.3%
Glass	1.4%
Metal	4.6%
Electronics	0.5%
Plastic	9.6%
Other Organic	32.4%
Inerts and Other	29.1%
HHW	0.3%
Special Waste	3.9%
Mixed Residue	0.8%
Total	**100%**

Numbers may not total exactly due to rounding.

Ten Most Prevalent Materials

Of the 10 most prevalent *material types* in the overall waste stream by weight, as shown in Table 6, *lumber* and *uncoated corrugated cardboard* are typically recyclable and together account for about 19 percent of the waste stream. Additionally, *food* and *leaves and grass* are compostable *material types* and account for another 19 percent of the waste stream. Together, the top 10 *material types* compose approximately 64 percent of overall disposed waste.

Table 6: Ten Most Prevalent Material Types in California's Overall Disposed Waste Stream

Material	Est. Percent	Cum. Percent	Est. Tons
Food	15.5%	15.5%	6,158,120
Lumber	14.5%	30.0%	5,765,482
Remainder/Composite Inerts and Other	5.5%	35.5%	2,175,322
Remainder/Composite Paper	5.2%	40.7%	2,056,546
Uncoated Corrugated Cardboard	4.8%	45.5%	1,905,897
Remainder/Composite Organic	4.3%	49.8%	1,719,743
Leaves and Grass	3.8%	53.6%	1,512,832
Bulky Items	3.5%	57.1%	1,393,091
Carpet	3.2%	60.3%	1,285,473
Rock, Soil and Fines	3.2%	63.5%	1,259,308
Total	**63.5%**		**25,231,814**

Any differences between *cumulative percent* figures and the sum of *estimated percent* figures are due to rounding.

For the **HHW** material *sharps*, items found in samples were both weighed and counted. On average, 3.2 sharps per ton are estimated to occur in the overall waste stream. Since sharps appeared infrequently in the study, this estimate has a higher degree of uncertainty. Sharps were found in 3 percent of the samples. The number of sharps varied from 1 to 196 in a sample, and weights varied from 0.005 pound to 1.3 pounds in a 200-pound sample. They occurred singly or a few at a time or in a container like a plastic milk jug filled with sharps. Most samples containing sharps came from the residential sector.

As samples were sorted the field crew estimated the proportion of *leaves and grass* that was leaves and the proportion that was grass. A total of 319 samples contained *leaves and grass*. Data from these samples were used to estimate that *leaves and grass* in California's overall disposed waste is approximately 46 percent leaves by weight; grass comprises the remaining 54 percent.

Detailed Composition

The composition percentages by weight for each *material type* in California's overall waste stream are listed in Table 7. Tables containing data for the 85 expanded *material types* can be found in Appendix D: Expanded Statewide Waste Characterization Tables.

Table 7: Composition of California's Overall Disposed Waste Stream

Material	Est. Percent	+ / -	Est. Tons	Material	Est. Percent	+ / -	Est. Tons
Paper	**17.3%**		**6,859,121**	**Other Organic**	**32.4%**		**12,888,039**
Uncoated Corrugated Cardboard	4.8%	0.9%	1,905,897	Food	15.5%	1.9%	6,158,120
Paper Bags	0.4%	0.1%	155,848	Leaves and Grass	3.8%	0.7%	1,512,832
Newspaper	1.3%	0.3%	499,960	Prunings and Trimmings	2.7%	1.5%	1,058,854
White Ledger Paper	0.7%	0.3%	259,151	Branches and Stumps	0.6%	0.4%	245,830
Other Office Paper	1.2%	0.6%	472,147	Manures	0.1%	0.1%	20,373
Magazines and Catalogs	0.7%	0.2%	283,069	Textiles	2.2%	0.3%	886,814
Phone Books and Directories	0.1%	0.0%	24,149	Carpet	3.2%	2.0%	1,285,473
Other Miscellaneous Paper	3.0%	0.4%	1,202,354	Remainder/Composite Organic	4.3%	0.5%	1,719,743
Remainder/Composite Paper	5.2%	0.7%	2,056,546				
				Inerts and Other	**29.1%**		**11,577,768**
Glass	**1.4%**		**565,844**	Concrete	1.2%	0.4%	483,367
Clear Glass Bottles and Containers	0.5%	0.1%	196,093	Asphalt Paving	0.3%	0.4%	129,834
Green Glass Bottles and Containers	0.2%	0.1%	79,491	Asphalt Roofing	2.8%	1.5%	1,121,945
Brown Glass Bottles and Containers	0.3%	0.1%	108,953	Lumber	14.5%	2.2%	5,765,482
Other Colored Glass Bottles and Containers	0.1%	0.0%	40,570	Gypsum Board	1.6%	0.7%	642,511
Flat Glass	0.1%	0.1%	33,899	Rock, Soil and Fines	3.2%	1.1%	1,259,308
Remainder/Composite Glass	0.3%	0.1%	106,838	Remainder/Composite Inerts and Other	5.5%	1.3%	2,175,322
Metal	**4.6%**		**1,809,684**	**Household Hazardous Waste (HHW)**	**0.3%**		**120,752**
Tin/Steel Cans	0.6%	0.1%	236,405	Paint	0.1%	0.1%	48,025
Major Appliances	0.0%	0.1%	17,120	Vehicle and Equipment Fluids	0.0%	0.0%	6,424
Used Oil Filters	0.0%	0.0%	3,610	Used Oil	0.0%	0.0%	3,348
Other Ferrous	2.0%	0.4%	801,704	Batteries	0.0%	0.0%	19,082
Aluminum Cans	0.1%	0.0%	47,829	Remainder/Composite Household Hazardous	0.1%	0.1%	43,873
Other Non-Ferrous	0.2%	0.1%	84,268				
Remainder/Composite Metal	1.6%	0.5%	618,747	**Special Waste**	**3.9%**		**1,546,470**
				Ash	0.1%	0.1%	40,736
Electronics	**0.5%**		**216,297**	Treated Medical Waste	0.0%	0.0%	0
Brown Goods	0.2%	0.1%	76,725	Bulky Items	3.5%	1.2%	1,393,091
Computer-related Electronics	0.1%	0.1%	32,932	Tires	0.2%	0.1%	60,180
Other Small Consumer Electronics	0.1%	0.0%	34,588	Remainder/Composite Special Waste	0.1%	0.1%	52,463
Video Display Devices	0.2%	0.1%	72,053				
				Mixed Residue	**0.8%**		**330,891**
Plastic	**9.6%**		**3,807,952**	Mixed Residue	0.8%	0.2%	330,891
PETE Containers	0.5%	0.1%	199,644				
HDPE Containers	0.4%	0.1%	157,779				
Miscellaneous Plastic Containers	0.4%	0.1%	163,008				
Plastic Trash Bags	0.9%	0.1%	361,997				
Plastic Grocery and Other Merchandise Bags	0.3%	0.0%	123,405				
Non-Bag Commercial and Industrial Packaging Film	0.5%	0.2%	194,863				
Film Products	0.3%	0.2%	113,566				
Other Film	1.4%	0.3%	554,002				
Durable Plastic Items	2.1%	0.4%	834,970	**Totals**	**100.0%**		**39,722,818**
Remainder/Composite Plastic	2.8%	0.7%	1,104,719	**Sample Count**	**751**		

Confidence intervals calculated at the 90% confidence level. Percentages for material types may not total 100% due to rounding.
More detailed composition tables can be found in Appendix D: Expanded Statewide Waste Characterization Tables

Commercial Waste

The objective of this portion of the study was to characterize California's disposed waste from commercial and industrial sources. Commercial waste is defined as waste disposed by businesses, industries, and public organizations that is collected and transported by contracted and franchised waste haulers. This includes waste delivered to disposal facilities by both packer trucks serving businesses on regular routes and loose or compacted drop boxes serving individual sites.

Overview and Analysis

Samples of commercial waste were obtained from randomly selected vehicles at the landfills and transfer stations participating in this study. Composition percents and estimated tons for each material were derived by combining data at the regional level with weighting proportionate to the estimated amount of commercial waste disposed in each region, as derived from the vehicle surveys. As shown in Table 5 the commercial sector accounts for approximately 50 percent of California's municipal solid waste stream. See Appendix A: Detailed Methodology for a description of the methods used in selecting, sorting, and analyzing samples.

Table 8 presents the numbers of samples that were obtained in each region and each season for commercial waste. In total, 250 samples of commercial waste were analyzed.

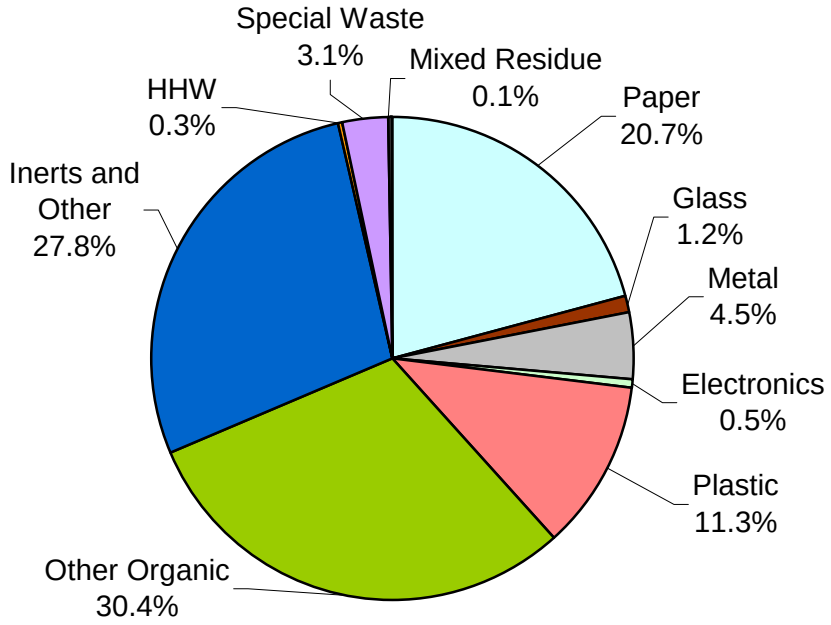
Table 8: Overall Commercial Samples Obtained, by Region and Season

Season	Bay Area	Coastal	Mountain	Southern	Valley	Totals
Winter 2008	10	11	16	13	10	**60**
Spring 2008	16	13	10	13	16	**68**
Summer 2008	12	10	13	15	11	**61**
Autumn 2008	12	16	11	9	13	**61**
Totals	**50**	**50**	**50**	**50**	**50**	**250**

See Appendix A: Detailed Methodology for the names and locations of the solid waste facilities that were visited.

Composition results by **Material Class** for commercial waste are illustrated in Figure 6 and described in detail in Table 10. The largest **Material Classes** of the commercial waste stream are **Other Organic** and **Inerts and Other**, which account for about 30 percent and 28 percent of the total, respectively.

Figure 6: Overview of Commercial Disposed Waste



Material Class	Est. Percent
Paper	20.7%
Glass	1.2%
Metal	4.5%
Electronics	0.5%
Plastic	11.3%
Other Organic	30.4%
Inerts and Other	27.8%
HHW	0.3%
Special Waste	3.1%
Mixed Residue	0.1%
Total	**100%**

Numbers may not total exactly due to rounding.

Ten Most Prevalent Materials

The 10 most prevalent *material types* (Table 9) account for about 67 percent of commercial waste. Typically recyclable *material types*, including *lumber*, *uncoated corrugated cardboard,* and *other miscellaneous paper*, make up roughly 26 percent of the commercial waste stream. *Food* and *prunings and trimmings* account for an additional 19 percent of the waste stream and are compostable.

Table 9: Ten Most Prevalent Material Types in Commercial Disposed Waste

Material	Est. Percent	Cum. Percent	Est. Tons
Lumber	15.7%	15.7%	3,088,666
Food	15.4%	31.1%	3,032,805
Uncoated Corrugated Cardboard	7.2%	38.4%	1,423,530
Remainder/Composite Paper	6.2%	44.5%	1,218,271
Remainder/Composite Inerts and Other	5.1%	49.6%	994,839
Remainder/Composite Plastic	4.0%	53.6%	788,056
Carpet	3.5%	57.2%	697,461
Prunings and Trimmings	3.3%	60.5%	658,051
Remainder/Composite Organic	3.2%	63.7%	628,700
Other Miscellaneous Paper	3.0%	66.7%	587,236
Total	**66.7%**		**13,117,616**

Any differences between *cumulative percent* figures and the sum of *estimated percent* figures are due to rounding.

Detailed Composition

Table 10 presents detailed composition results for the commercial waste stream. Tables containing data for the 85 expanded *material types* can be found in Appendix D: Expanded Statewide Waste Characterization Tables.

Table 10: Composition of Commercial Disposed Waste

Material	Est. Percent	+ / -	Est. Tons	Material	Est. Percent	+ / -	Est. Tons
Paper	**20.7%**		**4,072,311**	**Other Organic**	**30.4%**		**5,982,161**
Uncoated Corrugated Cardboard	7.2%	1.8%	1,423,530	Food	15.4%	3.7%	3,032,805
Paper Bags	0.4%	0.1%	71,741	Leaves and Grass	3.0%	1.0%	584,919
Newspaper	1.0%	0.3%	190,237	Prunings and Trimmings	3.3%	2.9%	658,051
White Ledger Paper	1.0%	0.5%	202,791	Branches and Stumps	0.5%	0.5%	100,513
Other Office Paper	1.3%	1.1%	249,456	Manures	0.0%	0.0%	149
Magazines and Catalogs	0.6%	0.3%	117,828	Textiles	1.4%	0.4%	279,563
Phone Books and Directories	0.1%	0.1%	11,220	Carpet	3.5%	3.6%	697,461
Other Miscellaneous Paper	3.0%	0.6%	587,236	Remainder/Composite Organic	3.2%	0.8%	628,700
Remainder/Composite Paper	6.2%	1.3%	1,218,271				
				Inerts and Other	**27.8%**		**5,461,616**
Glass	**1.2%**		**245,547**	Concrete	0.9%	0.5%	167,312
Clear Glass Bottles and Containers	0.4%	0.2%	85,349	Asphalt Paving	0.0%	0.0%	4,786
Green Glass Bottles and Containers	0.2%	0.1%	29,764	Asphalt Roofing	2.3%	2.6%	455,701
Brown Glass Bottles and Containers	0.3%	0.1%	51,366	Lumber	15.7%	3.2%	3,088,666
Other Colored Glass Bottles and Containers	0.0%	0.0%	7,798	Gypsum Board	1.5%	1.3%	300,703
Flat Glass	0.1%	0.1%	16,927	Rock, Soil and Fines	2.3%	1.4%	449,609
Remainder/Composite Glass	0.3%	0.2%	54,343	Remainder/Composite Inerts and Other	5.1%	2.0%	994,839
Metal	**4.5%**		**880,362**	**Household Hazardous Waste (HHW)**	**0.3%**		**55,007**
Tin/Steel Cans	0.6%	0.2%	113,789	Paint	0.2%	0.2%	41,084
Major Appliances	0.1%	0.1%	17,120	Vehicle and Equipment Fluids	0.0%	0.0%	1,076
Used Oil Filters	0.0%	0.0%	234	Used Oil	0.0%	0.0%	146
Other Ferrous	2.0%	0.6%	398,270	Batteries	0.0%	0.0%	4,768
Aluminum Cans	0.1%	0.0%	20,169	Remainder/Composite Household Hazardous	0.0%	0.0%	7,934
Other Non-Ferrous	0.2%	0.1%	43,557				
Remainder/Composite Metal	1.5%	0.8%	287,223	**Special Waste**	**3.1%**		**617,641**
				Ash	0.2%	0.2%	32,314
Electronics	**0.5%**		**96,710**	Treated Medical Waste	0.0%	0.0%	0
Brown Goods	0.2%	0.1%	38,583	Bulky Items	2.5%	1.7%	489,093
Computer-related Electronics	0.0%	0.0%	2,686	Tires	0.3%	0.3%	55,700
Other Small Consumer Electronics	0.1%	0.0%	10,516	Remainder/Composite Special Waste	0.2%	0.2%	40,534
Video Display Devices	0.2%	0.3%	44,926				
				Mixed Residue	**0.1%**		**28,507**
Plastic	**11.3%**		**2,232,684**	Mixed Residue	0.1%	0.1%	28,507
PETE Containers	0.5%	0.1%	89,177				
HDPE Containers	0.4%	0.1%	74,261				
Miscellaneous Plastic Containers	0.4%	0.1%	84,301				
Plastic Trash Bags	1.2%	0.3%	233,075				
Plastic Grocery and Other Merchandise Bags	0.2%	0.1%	43,671				
Non-Bag Commercial and Industrial Packaging Film	0.8%	0.4%	166,675				
Film Products	0.2%	0.1%	38,321				
Other Film	1.7%	0.6%	329,444				
Durable Plastic Items	2.0%	0.6%	385,704	**Totals**	**100.0%**		**19,672,547**
Remainder/Composite Plastic	4.0%	1.4%	788,056	**Sample Count**	**250**		

Confidence intervals calculated at the 90% confidence level. Percentages for material types may not total 100% due to rounding.
More detailed composition tables can be found in Appendix D: Expanded Statewide Waste Characterization Tables

Residential Waste

The objective of this portion of the study was to characterize California's residential waste stream at the state level. Residential waste is defined as waste disposed by households that is collected and transported by contracted and franchised waste haulers. This section presents composition findings for the statewide residential sector as a whole, followed by findings for single-family residential waste and multifamily residential waste.

Overview and Analysis

The residential sector accounts for approximately 30 percent of California's municipal solid waste stream. The single-family residential subsector accounts for approximately 22 percent and the multifamily residential subsector accounts for approximately 8 percent.

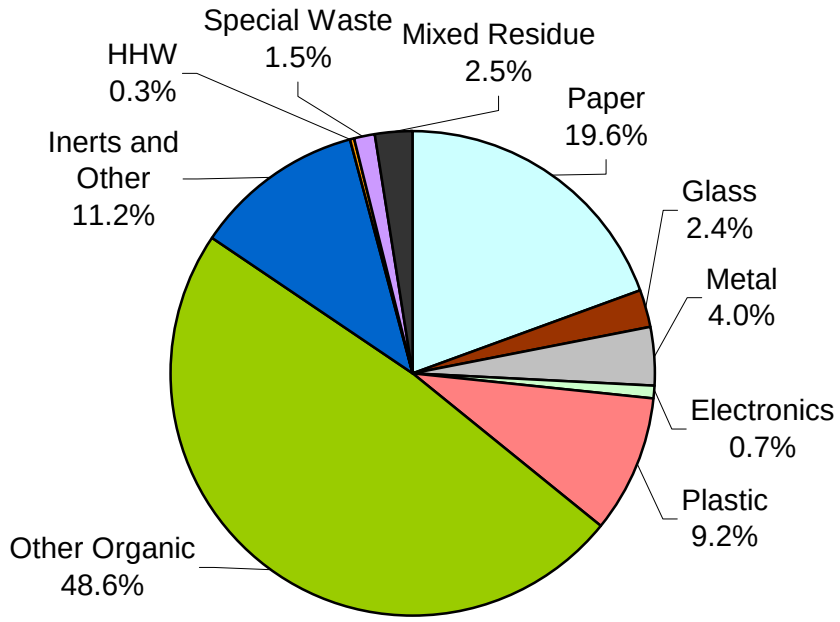
As with many waste composition studies, this study considered single-family residential waste separately from multifamily residential waste. Multifamily waste is typically collected along with commercial waste, and it becomes impractical to separate the multifamily from the commercial waste for sampling at solid waste sites. The present study therefore captured multifamily waste at the point of generation (apartment complexes).

Samples of single-family residential waste were obtained from randomly selected vehicles at the landfills and transfer stations that participated in this study. Samples of multifamily residential waste were collected at multifamily complexes that were selected randomly from the area surrounding the participating solid waste facilities. Composition percents and estimated tons for each material type were derived separately for the single-family residential and multifamily residential subsectors. The estimates for the two subsectors were then combined, with weighting proportionate to the prevalence of each subsector in the overall waste stream, as derived from the vehicle surveys. See Appendix A: Detailed Methodology for a description of the methods used in selecting, sorting, and analyzing samples.

Table 13 and Table 16 present the numbers of samples that were obtained in each region and each season for single-family residential waste and multifamily residential waste, respectively. In all, 251 samples of residential waste were analyzed (201 single-family and 50 multifamily).

Composition results by **Material Class** for residential disposed waste are illustrated in Figure 7 and described in detail in Table 12. A large portion—an estimated 49 percent—of the residential waste stream was composed of **Other Organic** material.

Figure 7: Overview of Overall Residential Disposed Waste



Material Class	Est. Percent
Paper	19.6%
Glass	2.4%
Metal	4.0%
Electronics	0.7%
Plastic	9.2%
Other Organic	48.6%
Inerts and Other	11.2%
HHW	0.3%
Special Waste	1.5%
Mixed Residue	2.5%
Total	**100%**

Numbers may not total exactly due to rounding.

Ten Most Prevalent Materials

The 10 most prevalent *material types*, shown in Table 11, include the compostable *food* and *leaves and grass.* Prevalent recyclable *material types* found include *lumber* (about 7 percent), *other miscellaneous paper* (5 percent), and *uncoated corrugated cardboard* (3 percent).

Table 11: Ten Most Prevalent Material Types in Overall Residential Disposed Waste

Material	Est. Percent	Cum. Percent	Est. Tons
Food	25.4%	25.4%	3,034,040
Remainder/Composite Organic	8.4%	33.8%	1,002,937
Lumber	6.7%	40.5%	794,897
Leaves and Grass	6.0%	46.5%	715,353
Remainder/Composite Paper	6.0%	52.5%	714,716
Other Miscellaneous Paper	4.5%	57.0%	538,988
Textiles	4.2%	61.2%	506,658
Remainder/Composite Inerts and Other	2.8%	64.1%	339,929
Uncoated Corrugated Cardboard	2.7%	66.8%	323,058
Mixed Residue	2.5%	69.3%	297,515
Total	**69.3%**		**8,268,092**

Any differences between *cumulative percent* figures and the sum of *estimated percent* figures are due to rounding.

As samples were sorted the field crew estimated the proportion of the material *leaves and grass* that was leaves and the proportion that was grass. The field crew sorted 170 residential samples containing *leaves and grass*. The *leaves and grass* in the residential disposed waste is approximately 43 percent leaves by weight; grass comprises the remaining 57 percent.

Detailed Composition

Table 12 presents the composition percentages, by weight, for each *material type* in the overall residential sector. Tables containing data for the 85 expanded *material types* can be found in Appendix D: Expanded Statewide Waste Characterization Tables.

Table 12: Composition of Overall Residential Disposed Waste

Material	Est. Percent	+ / -	Est. Tons	Material	Est. Percent	+ / -	Est. Tons
Paper	**19.6%**		**2,337,272**	**Other Organic**	**48.6%**		**5,800,260**
Uncoated Corrugated Cardboard	2.7%	0.4%	323,058	Food	25.4%	2.2%	3,034,040
Paper Bags	0.5%	0.1%	59,705	Leaves and Grass	6.0%	1.3%	715,353
Newspaper	2.4%	0.6%	288,196	Prunings and Trimmings	1.9%	0.7%	225,375
White Ledger Paper	0.4%	0.1%	43,352	Branches and Stumps	0.1%	0.1%	17,032
Other Office Paper	1.7%	0.4%	203,895	Manures	0.2%	0.2%	20,224
Magazines and Catalogs	1.3%	0.2%	153,431	Textiles	4.2%	0.7%	506,658
Phone Books and Directories	0.1%	0.1%	11,929	Carpet	2.3%	2.2%	278,641
Other Miscellaneous Paper	4.5%	0.5%	538,988	Remainder/Composite Organic	8.4%	1.1%	1,002,937
Remainder/Composite Paper	6.0%	0.6%	714,716				
				Inerts and Other	**11.2%**		**1,340,446**
Glass	**2.4%**		**282,933**	Concrete	0.5%	0.4%	63,281
Clear Glass Bottles and Containers	0.9%	0.2%	106,493	Asphalt Paving	0.0%	0.0%	544
Green Glass Bottles and Containers	0.4%	0.1%	48,187	Asphalt Roofing	0.2%	0.1%	22,010
Brown Glass Bottles and Containers	0.5%	0.2%	55,403	Lumber	6.7%	3.2%	794,897
Other Colored Glass Bottles and Containers	0.2%	0.1%	29,633	Gypsum Board	0.2%	0.1%	28,585
Flat Glass	0.0%	0.0%	1,125	Rock, Soil and Fines	0.8%	0.5%	91,199
Remainder/Composite Glass	0.4%	0.2%	42,093	Remainder/Composite Inerts and Other	2.8%	1.8%	339,929
Metal	**4.0%**		**478,431**	**Household Hazardous Waste (HHW)**	**0.3%**		**34,117**
Tin/Steel Cans	1.0%	0.1%	115,920	Paint	0.0%	0.0%	3,449
Major Appliances	0.0%	0.0%	0	Vehicle and Equipment Fluids	0.0%	0.0%	4,252
Used Oil Filters	0.0%	0.0%	3,012	Used Oil	0.0%	0.0%	2,843
Other Ferrous	1.3%	0.4%	149,347	Batteries	0.1%	0.1%	13,376
Aluminum Cans	0.2%	0.0%	26,171	Remainder/Composite Household Hazardous	0.1%	0.0%	10,196
Other Non-Ferrous	0.3%	0.1%	31,512				
Remainder/Composite Metal	1.3%	0.4%	152,469	**Special Waste**	**1.5%**		**174,453**
				Ash	0.1%	0.0%	6,960
Electronics	**0.7%**		**86,262**	Treated Medical Waste	0.0%	0.0%	0
Brown Goods	0.2%	0.1%	28,421	Bulky Items	1.3%	1.0%	154,051
Computer-related Electronics	0.1%	0.1%	11,357	Tires	0.0%	0.0%	2,570
Other Small Consumer Electronics	0.2%	0.1%	23,388	Remainder/Composite Special Waste	0.1%	0.1%	10,873
Video Display Devices	0.2%	0.2%	23,096				
				Mixed Residue	**2.5%**		**297,515**
Plastic	**9.2%**		**1,103,485**	Mixed Residue	2.5%	0.8%	297,515
PETE Containers	0.9%	0.1%	105,170				
HDPE Containers	0.7%	0.1%	78,846				
Miscellaneous Plastic Containers	0.6%	0.1%	74,429				
Plastic Trash Bags	0.9%	0.1%	109,464				
Plastic Grocery and Other Merchandise Bags	0.6%	0.1%	76,760				
Non-Bag Commercial and Industrial Packaging Film	0.0%	0.0%	4,422				
Film Products	0.1%	0.1%	6,428				
Other Film	1.7%	0.2%	207,770				
Durable Plastic Items	2.0%	0.5%	238,180	**Totals**	**100.0%**		**11,935,173**
Remainder/Composite Plastic	1.7%	0.2%	202,017	**Sample Count**	**251**		

Confidence intervals calculated at the 90% confidence level. Percentages for material types may not total 100% due to rounding.
More detailed composition tables can be found in Appendix D: Expanded Statewide Waste Characterization Tables

Single-Family Residential Waste

The objective of this portion of the study was to characterize California's single-family residential waste stream at the state level. This is a subsector of the residential waste stream, and includes waste that is collected by haulers from single-family residences.

Overview and Analysis

Samples of single-family residential waste were obtained from randomly selected vehicles at the landfills and transfer stations participating in this study. Approximately 40 samples were obtained from each of the five regions of the state. See Appendix A: Detailed Methodology for a description of the methods used in selecting, sorting, and analyzing samples.

Table 13 presents the numbers of samples that were obtained in each region and each season. Statewide, 201 samples of single-family residential waste were collected and sorted.

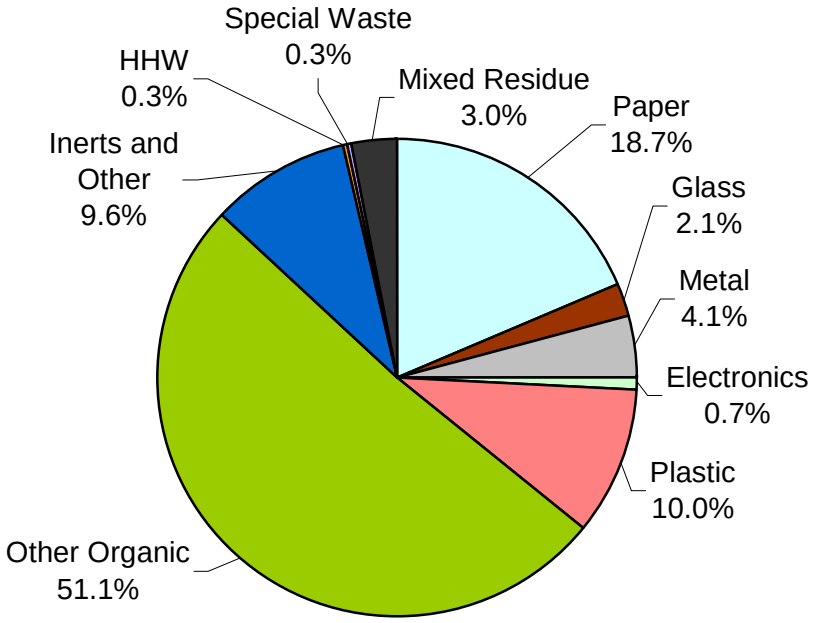
Table 13: Single-Family Residential Samples Obtained, by Region and Season

Season	Bay Area	Coastal	Mountain	Southern	Valley	Totals
Winter 2008	8	9	11	13	9	**50**
Spring 2008	12	12	8	5	12	**49**
Summer 2008	8	8	15	12	8	**51**
Autumn 2008	12	12	6	10	11	**51**
Totals	**40**	**41**	**40**	**40**	**40**	**201**

See Appendix A: Detailed Methodology for the names and locations of the solid waste facilities that were visited.

Composition results by **Material Class** for single-family residential waste are illustrated in Figure 8 and described in detail in Table 15. The largest **Material Class** in the single-family residential waste stream is **Other Organic**, which accounted for an estimated 51 percent of the total, by weight. **Paper**, the next largest **Material Class**, accounted for about 19 percent of the waste.

Figure 8: Overview of Single-Family Residential Disposed Waste



Material Class	Est. Percent
Paper	18.7%
Glass	2.1%
Metal	4.1%
Electronics	0.7%
Plastic	10.0%
Other Organic	51.1%
Inerts and Other	9.6%
HHW	0.3%
Special Waste	0.3%
Mixed Residue	3.0%
Total	**100.0%**

Numbers may not total exactly due to rounding.

Ten Most Prevalent Materials

As shown in Table 14, the compostable *food*, *leaves and grass*, and *prunings and trimmings* together make up about 37 percent of the single-family residential waste stream. Prevalent *material types* that are typically recyclable include *lumber* and *other miscellaneous paper*.

Table 14: Ten Most Prevalent Material Types in Single-Family Residential Disposed Waste

Material	Est. Percent	Cum. Percent	Est. Tons
Food	26.5%	26.5%	2,277,194
Remainder/Composite Organic	8.3%	34.8%	708,770
Leaves and Grass	7.5%	42.3%	646,018
Remainder/Composite Paper	6.5%	48.8%	556,734
Lumber	5.1%	53.9%	439,877
Textiles	4.5%	58.4%	382,018
Other Miscellaneous Paper	4.3%	62.7%	371,979
Mixed Residue	3.0%	65.7%	259,331
Prunings and Trimmings	2.5%	68.3%	218,759
Durable Plastic Items	2.5%	70.7%	211,961
Total	**70.7%**		**6,072,641**

Any differences between *cumulative percent* figures and the sum of *estimated percent* figures are due to rounding.

Detailed Composition

Table 15 presents the detailed composition results for the single-family residential subsector. Tables containing data for the 85 expanded *material types* can be found in Appendix D: Expanded Statewide Waste Characterization Tables.

Table 15: Composition of Single-Family Residential Disposed Waste

Material	Est. Percent	+ / -	Est. Tons	Material	Est. Percent	+ / -	Est. Tons
Paper	**18.7%**		**1,608,183**	**Other Organic**	**51.1%**		**4,389,119**
Uncoated Corrugated Cardboard	2.1%	0.3%	176,011	Food	26.5%	2.2%	2,277,194
Paper Bags	0.5%	0.1%	42,817	Leaves and Grass	7.5%	1.7%	646,018
Newspaper	2.2%	0.3%	188,462	Prunings and Trimmings	2.5%	1.0%	218,759
White Ledger Paper	0.4%	0.1%	30,485	Branches and Stumps	0.2%	0.2%	17,032
Other Office Paper	1.4%	0.2%	118,662	Manures	0.2%	0.3%	20,224
Magazines and Catalogs	1.3%	0.2%	112,805	Textiles	4.5%	0.7%	382,018
Phone Books and Directories	0.1%	0.1%	10,228	Carpet	1.4%	0.8%	119,105
Other Miscellaneous Paper	4.3%	0.4%	371,979	Remainder/Composite Organic	8.3%	0.9%	708,770
Remainder/Composite Paper	6.5%	0.6%	556,734				
				Inerts and Other	**9.6%**		**823,269**
Glass	**2.1%**		**179,435**	Concrete	0.7%	0.5%	63,228
Clear Glass Bottles and Containers	0.7%	0.1%	63,908	Asphalt Paving	0.0%	0.0%	544
Green Glass Bottles and Containers	0.4%	0.1%	30,567	Asphalt Roofing	0.3%	0.2%	21,945
Brown Glass Bottles and Containers	0.4%	0.1%	32,855	Lumber	5.1%	2.3%	439,877
Other Colored Glass Bottles and Containers	0.2%	0.0%	15,985	Gypsum Board	0.3%	0.2%	27,070
Flat Glass	0.0%	0.0%	542	Rock, Soil and Fines	1.1%	0.8%	90,658
Remainder/Composite Glass	0.4%	0.2%	35,578	Remainder/Composite Inerts and Other	2.1%	1.1%	179,948
Metal	**4.1%**		**355,542**	**Household Hazardous Waste (HHW)**	**0.3%**		**23,304**
Tin/Steel Cans	1.0%	0.1%	85,059	Paint	0.0%	0.0%	3,137
Major Appliances	0.0%	0.0%	0	Vehicle and Equipment Fluids	0.0%	0.0%	2,217
Used Oil Filters	0.0%	0.0%	3,010	Used Oil	0.0%	0.0%	2,843
Other Ferrous	1.3%	0.4%	111,328	Batteries	0.1%	0.1%	11,114
Aluminum Cans	0.3%	0.0%	21,610	Remainder/Composite Household Hazardous	0.0%	0.0%	3,993
Other Non-Ferrous	0.3%	0.1%	25,401				
Remainder/Composite Metal	1.3%	0.4%	109,134	**Special Waste**	**0.3%**		**24,313**
				Ash	0.0%	0.0%	4,034
Electronics	**0.7%**		**62,806**	Treated Medical Waste	0.0%	0.0%	0
Brown Goods	0.3%	0.2%	23,037	Bulky Items	0.1%	0.1%	7,904
Computer-related Electronics	0.1%	0.1%	10,305	Tires	0.0%	0.0%	2,570
Other Small Consumer Electronics	0.2%	0.2%	19,995	Remainder/Composite Special Waste	0.1%	0.1%	9,805
Video Display Devices	0.1%	0.2%	9,469				
				Mixed Residue	**3.0%**		**259,331**
Plastic	**10.0%**		**858,442**	Mixed Residue	3.0%	0.9%	259,331
PETE Containers	0.8%	0.1%	70,247				
HDPE Containers	0.6%	0.1%	47,659				
Miscellaneous Plastic Containers	0.6%	0.1%	53,492				
Plastic Trash Bags	1.0%	0.1%	84,372				
Plastic Grocery and Other Merchandise Bags	0.7%	0.1%	58,641				
Non-Bag Commercial and Industrial Packaging Film	0.0%	0.0%	4,016				
Film Products	0.0%	0.0%	1,687				
Other Film	1.9%	0.3%	167,064				
Durable Plastic Items	2.5%	0.6%	211,961	**Totals**	**100.0%**		**8,583,746**
Remainder/Composite Plastic	1.9%	0.2%	159,302	**Sample Count**	**201**		

Confidence intervals calculated at the 90% confidence level. Percentages for material types may not total 100% due to rounding.
More detailed composition tables can be found in Appendix D: Expanded Statewide Waste Characterization Tables

Multifamily Residential Waste

The objective of this portion of the study was to characterize California's multifamily residential waste stream at the state level. This subsector includes waste that is collected by haulers from apartments or condominiums.

Overview and Analysis

Samples of multifamily residential waste were obtained from apartment complexes that were selected randomly from the area surrounding the solid waste facilities that participated in the study. See Appendix A: Detailed Methodology for a list of participating facilities. Fifty samples of multifamily waste were collected in the five regions of the state.

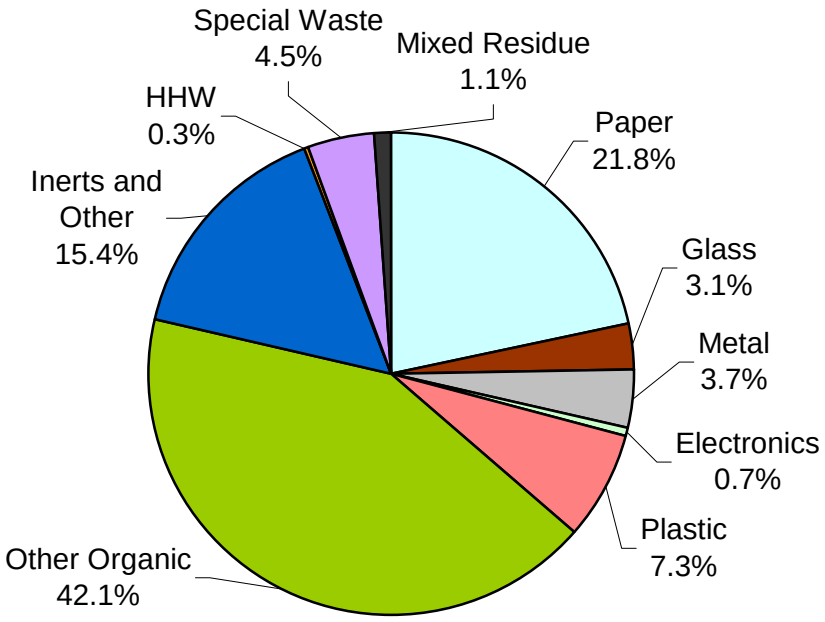
Table 17 presents the numbers of samples that were obtained in each region and each season.

Table 16: Multifamily Residential Samples Obtained, by Region and Season

Season	Bay Area	Coastal	Mountain	Southern	Valley	Totals
Winter 2008	2	2	3	3	2	**12**
Spring 2008	3	3	2	2	3	**13**
Summer 2008	2	2	3	3	2	**12**
Autumn 2008	3	3	2	2	3	**13**
Totals	**10**	**10**	**10**	**10**	**10**	**50**

Composition results by **Material Class** for multifamily residential waste are illustrated in Figure 9 and described in detail in Table 18. As shown in Figure 9, the largest **Material Class** is **Other Organic**, which accounts for about 42 percent, followed by **Paper**, which makes up about 22 percent of the multifamily residential waste stream by weight.

Figure 9: Overview of Multifamily Residential Disposed Waste



Material Class	Est. Percent
Paper	21.8%
Glass	3.1%
Metal	3.7%
Electronics	0.7%
Plastic	7.3%
Other Organic	42.1%
Inerts and Other	15.4%
HHW	0.3%
Special Waste	4.5%
Mixed Residue	1.1%
Total	**100%**

Numbers may not total exactly due to rounding.

Ten Most Prevalent Materials

As shown in Table 17, *food* (23 percent) is the most prevalent *material type* in multifamily residential waste. Typically recyclable prevalent *material types*, including *lumber*, *other miscellaneous paper*, and *uncoated corrugated cardboard*, account for 20 percent of the total.

Table 17: Ten Most Prevalent Material Types in Multifamily Residential Disposed Waste

Material	Est. Percent	Cum. Percent	Est. Tons
Food	22.6%	22.6%	756,846
Lumber	10.6%	33.2%	355,021
Remainder/Composite Organic	8.8%	42.0%	294,167
Other Miscellaneous Paper	5.0%	46.9%	167,009
Remainder/Composite Inerts and Other	4.8%	51.7%	159,982
Carpet	4.8%	56.5%	159,536
Remainder/Composite Paper	4.7%	61.2%	157,982
Uncoated Corrugated Cardboard	4.4%	65.6%	147,048
Bulky Items	4.4%	69.9%	146,147
Textiles	3.7%	73.7%	124,641
Total	**73.7%**		**2,468,377**

Any differences between *cumulative percent* figures and the sum of *estimated percent* figures are due to rounding.

Detailed Composition

Table 18 presents the detailed composition results for the multifamily residential subsector. Tables containing data for the 85 expanded *material types* can be found in Appendix D: Expanded Statewide Waste Characterization Tables.

Table 18: Composition of Multifamily Residential Disposed Waste

Material	Est. Percent	+ / -	Est. Tons	Material	Est. Percent	+ / -	Est. Tons
Paper	**21.8%**		**729,089**	**Other Organic**	**42.1%**		**1,411,140**
Uncoated Corrugated Cardboard	4.4%	1.2%	147,048	Food	22.6%	5.5%	756,846
Paper Bags	0.5%	0.1%	16,887	Leaves and Grass	2.1%	1.8%	69,336
Newspaper	3.0%	2.1%	99,735	Prunings and Trimmings	0.2%	0.1%	6,616
White Ledger Paper	0.4%	0.2%	12,867	Branches and Stumps	0.0%	0.0%	0
Other Office Paper	2.5%	1.2%	85,234	Manures	0.0%	0.0%	0
Magazines and Catalogs	1.2%	0.5%	40,627	Textiles	3.7%	1.7%	124,641
Phone Books and Directories	0.1%	0.1%	1,702	Carpet	4.8%	7.5%	159,536
Other Miscellaneous Paper	5.0%	1.4%	167,009	Remainder/Composite Organic	8.8%	3.0%	294,167
Remainder/Composite Paper	4.7%	1.4%	157,982				
				Inerts and Other	**15.4%**		**517,176**
Glass	**3.1%**		**103,497**	Concrete	0.0%	0.0%	53
Clear Glass Bottles and Containers	1.3%	0.6%	42,585	Asphalt Paving	0.0%	0.0%	0
Green Glass Bottles and Containers	0.5%	0.4%	17,620	Asphalt Roofing	0.0%	0.0%	65
Brown Glass Bottles and Containers	0.7%	0.5%	22,548	Lumber	10.6%	9.8%	355,021
Other Colored Glass Bottles and Containers	0.4%	0.3%	13,648	Gypsum Board	0.0%	0.1%	1,515
Flat Glass	0.0%	0.0%	582	Rock, Soil and Fines	0.0%	0.0%	541
Remainder/Composite Glass	0.2%	0.1%	6,514	Remainder/Composite Inerts and Other	4.8%	5.9%	159,982
Metal	**3.7%**		**122,889**	**Household Hazardous Waste (HHW)**	**0.3%**		**10,813**
Tin/Steel Cans	0.9%	0.3%	30,862	Paint	0.0%	0.0%	312
Major Appliances	0.0%	0.0%	0	Vehicle and Equipment Fluids	0.1%	0.1%	2,036
Used Oil Filters	0.0%	0.0%	2	Used Oil	0.0%	0.0%	0
Other Ferrous	1.1%	0.9%	38,019	Batteries	0.1%	0.1%	2,261
Aluminum Cans	0.1%	0.1%	4,561	Remainder/Composite Household Hazardous	0.2%	0.1%	6,204
Other Non-Ferrous	0.2%	0.1%	6,111				
Remainder/Composite Metal	1.3%	0.9%	43,335	**Special Waste**	**4.5%**		**150,140**
				Ash	0.1%	0.1%	2,926
Electronics	**0.7%**		**23,456**	Treated Medical Waste	0.0%	0.0%	0
Brown Goods	0.2%	0.2%	5,384	Bulky Items	4.4%	3.6%	146,147
Computer-related Electronics	0.0%	0.1%	1,052	Tires	0.0%	0.0%	0
Other Small Consumer Electronics	0.1%	0.1%	3,393	Remainder/Composite Special Waste	0.0%	0.1%	1,067
Video Display Devices	0.4%	0.6%	13,626				
				Mixed Residue	**1.1%**		**38,183**
Plastic	**7.3%**		**245,043**	Mixed Residue	1.1%	1.4%	38,183
PETE Containers	1.0%	0.4%	34,923				
HDPE Containers	0.9%	0.3%	31,186				
Miscellaneous Plastic Containers	0.6%	0.2%	20,937				
Plastic Trash Bags	0.7%	0.1%	25,092				
Plastic Grocery and Other Merchandise Bags	0.5%	0.2%	18,119				
Non-Bag Commercial and Industrial Packaging Film	0.0%	0.0%	406				
Film Products	0.1%	0.2%	4,741				
Other Film	1.2%	0.4%	40,706				
Durable Plastic Items	0.8%	0.2%	26,219	**Totals**	**100.0%**		**3,351,428**
Remainder/Composite Plastic	1.3%	0.3%	42,715	**Sample Count**	**50**		

Confidence intervals calculated at the 90% confidence level. Percentages for material types may not total 100% due to rounding.
More detailed composition tables can be found in Appendix D: Expanded Statewide Waste Characterization Tables

Self-hauled Waste

The objective of this portion of the study was to characterize California's self-hauled waste stream at the state level. Self-hauled waste is waste that is transported to the solid waste disposal site by someone other than a contracted or franchised hauler. This section presents composition findings for the statewide self-hauled sector as a whole, followed by findings for commercial self-hauled waste and residential self-hauled waste.

Overview and Analysis

As shown in Table 5 the self-hauled waste sector accounts for approximately 20 percent of California's municipal solid waste stream. The commercial self-hauled and residential self-hauled subsectors make up approximately 17 percent and 3 percent, respectively.

Samples of self-hauled waste were obtained from randomly selected vehicles at the landfills and transfer stations visited in this study. Fifty samples were obtained from each of the five regions of the state. Overall self-hauled composition results are based on the commercial and residential subsectors, weighted at the regional level. See Appendix A: Detailed Methodology for a description of the methods used in selecting, sorting, and analyzing samples.

As part of the vehicle survey, drivers of vehicles carrying commercial self-hauled waste to solid waste facilities were asked to classify the activity that generated the waste. The possible responses were construction/demolition/remodeling, roofing, landscaping, and other commercial or industrial activities. Their responses indicate that commercial self-hauled waste from construction, demolition, and remodeling activities represents 7 percent of the total waste stream. Waste from commercially self-hauled roofing and landscaping activities constitute less than two and one percent of the overall waste stream respectively. Other miscellaneous commercial activities generate commercial self-hauled waste that represents approximately 8 percent of the overall waste stream. These results are shown in Table 22.

Table 19 presents the numbers of samples that were obtained in each region and each season. Overall, 250 samples of self-hauled waste were sorted.

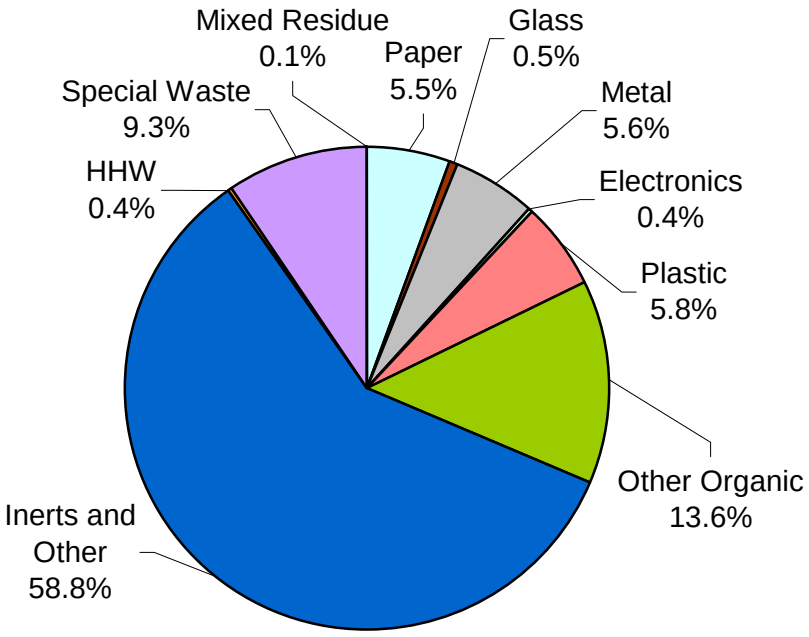
Table 19: Self-hauled Samples Obtained by Region and Season

Season	Bay Area	Coastal	Mountain	Southern	Valley	Totals
Winter 2008	10	8	15	16	9	**58**
Spring 2008	16	17	10	11	14	**68**
Summer 2008	8	11	14	15	9	**57**
Autumn 2008	16	14	11	8	18	**67**
Totals	**50**	**50**	**50**	**50**	**50**	**250**

See Appendix A: Detailed Methodology for the names and locations of the solid waste facilities that were visited.

Composition results by **Material Class** for self-hauled waste are illustrated in Figure 10 and described in detail in Table 21. More than half of the overall self-hauled waste stream—approximately 59 percent—was comprised of the class **Inerts and Other**.

Figure 10: Overview of Overall Self-hauled Disposed Waste



Material Class	Est. Percent
Paper	5.5%
Glass	0.5%
Metal	5.6%
Electronics	0.4%
Plastic	5.8%
Other Organic	13.6%
Inerts and Other	58.8%
HHW	0.4%
Special Waste	9.3%
Mixed Residue	0.1%
Total	**100%**

Numbers may not total exactly due to rounding.

Ten Most Prevalent Materials

Lumber, a readily recyclable material, was most prevalent in self-hauled waste, accounting for an estimated 23 percent of the overall self-hauled waste stream. Other readily recyclable *material types* included *asphalt roofing*, *gypsum board*, *other ferrous metal*, and *concrete*, as shown in Table 20.

Table 20: Ten Most Prevalent Material Types in Overall Self-hauled Disposed Waste

Material	Est. Percent	Cum. Percent	Est. Tons
Lumber	23.2%	23.2%	1,881,918
Remainder/Composite Inerts and Other	10.4%	33.5%	840,554
Bulky Items	9.2%	42.8%	749,947
Rock, Soil and Fines	8.9%	51.6%	718,500
Asphalt Roofing	7.9%	59.6%	644,234
Gypsum Board	3.9%	63.4%	313,223
Carpet	3.8%	67.3%	309,371
Other Ferrous	3.1%	70.4%	254,087
Concrete	3.1%	73.5%	252,774
Leaves and Grass	2.6%	76.1%	212,560
Total	**76.1%**		**6,177,167**

Any differences between *cumulative percent* figures and the sum of *estimated percent* figures are due to rounding.

Detailed Composition

Table 21 presents the detailed composition results for the overall self-hauled sector. Tables containing data for the 85 expanded *material types* can be found in Appendix D: Expanded Statewide Waste Characterization Tables.

Table 21: Composition of Overall Self-hauled Disposed Waste

Material	Est. Percent	+ / -	Est. Tons	Material	Est. Percent	+ / -	Est. Tons
Paper	**5.5%**		**449,539**	**Other Organic**	**13.6%**		**1,105,618**
Uncoated Corrugated Cardboard	2.0%	0.6%	159,309	Food	1.1%	0.5%	91,275
Paper Bags	0.3%	0.2%	24,402	Leaves and Grass	2.6%	1.1%	212,560
Newspaper	0.3%	0.3%	21,526	Prunings and Trimmings	2.2%	1.2%	175,428
White Ledger Paper	0.2%	0.2%	13,008	Branches and Stumps	1.6%	1.4%	128,285
Other Office Paper	0.2%	0.3%	18,795	Manures	0.0%	0.0%	0
Magazines and Catalogs	0.1%	0.1%	11,810	Textiles	1.2%	0.5%	100,593
Phone Books and Directories	0.0%	0.0%	999	Carpet	3.8%	2.4%	309,371
Other Miscellaneous Paper	0.9%	0.8%	76,130	Remainder/Composite Organic	1.1%	0.4%	88,106
Remainder/Composite Paper	1.5%	0.7%	123,558				
				Inerts and Other	**58.8%**		**4,775,706**
Glass	**0.5%**		**37,364**	Concrete	3.1%	1.5%	252,774
Clear Glass Bottles and Containers	0.1%	0.0%	4,251	Asphalt Paving	1.5%	2.0%	124,504
Green Glass Bottles and Containers	0.0%	0.0%	1,540	Asphalt Roofing	7.9%	3.5%	644,234
Brown Glass Bottles and Containers	0.0%	0.0%	2,184	Lumber	23.2%	5.5%	1,881,918
Other Colored Glass Bottles and Containers	0.0%	0.1%	3,139	Gypsum Board	3.9%	1.8%	313,223
Flat Glass	0.2%	0.2%	15,848	Rock, Soil and Fines	8.9%	4.2%	718,500
Remainder/Composite Glass	0.1%	0.1%	10,403	Remainder/Composite Inerts and Other	10.4%	3.7%	840,554
Metal	**5.6%**		**450,890**	**Household Hazardous Waste (HHW)**	**0.4%**		**31,628**
Tin/Steel Cans	0.1%	0.0%	6,696	Paint	0.0%	0.0%	3,492
Major Appliances	0.0%	0.0%	0	Vehicle and Equipment Fluids	0.0%	0.0%	1,096
Used Oil Filters	0.0%	0.0%	364	Used Oil	0.0%	0.0%	359
Other Ferrous	3.1%	1.0%	254,087	Batteries	0.0%	0.0%	938
Aluminum Cans	0.0%	0.0%	1,489	Remainder/Composite Household Hazardous	0.3%	0.4%	25,743
Other Non-Ferrous	0.1%	0.1%	9,199				
Remainder/Composite Metal	2.2%	1.2%	179,056	**Special Waste**	**9.3%**		**754,376**
				Ash	0.0%	0.0%	1,462
Electronics	**0.4%**		**33,325**	Treated Medical Waste	0.0%	0.0%	0
Brown Goods	0.1%	0.1%	9,721	Bulky Items	9.2%	3.7%	749,947
Computer-related Electronics	0.2%	0.4%	18,888	Tires	0.0%	0.0%	1,910
Other Small Consumer Electronics	0.0%	0.0%	685	Remainder/Composite Special Waste	0.0%	0.0%	1,056
Video Display Devices	0.0%	0.0%	4,031				
				Mixed Residue	**0.1%**		**4,870**
Plastic	**5.8%**		**471,782**	Mixed Residue	0.1%	0.0%	4,870
PETE Containers	0.1%	0.0%	5,296				
HDPE Containers	0.1%	0.0%	4,672				
Miscellaneous Plastic Containers	0.1%	0.0%	4,279				
Plastic Trash Bags	0.2%	0.1%	19,458				
Plastic Grocery and Other Merchandise Bags	0.0%	0.0%	2,974				
Non-Bag Commercial and Industrial Packaging Film	0.3%	0.2%	23,767				
Film Products	0.8%	0.9%	68,817				
Other Film	0.2%	0.1%	16,787				
Durable Plastic Items	2.6%	1.3%	211,086	**Totals**	**100.0%**		**8,115,098**
Remainder/Composite Plastic	1.4%	0.8%	114,646	**Sample Count**	**250**		

Confidence intervals calculated at the 90% confidence level. Percentages for material types may not total 100% due to rounding.
More detailed composition tables can be found in Appendix D: Expanded Statewide Waste Characterization Tables

Commercial Self-hauled Waste

The objective of this portion of the study was to characterize California's commercial self-hauled waste stream at the state level. This sector includes waste hauled to a solid waste disposal site by a commercial enterprise, such as a landscaper or contractor, even if the source of waste was residential dwellings.

Overview and Analysis

Samples of commercial self-hauled waste were obtained from randomly selected vehicles at the landfills and transfer stations visited in this study. Drivers bringing commercial self-hauled waste were asked to describe the activity that generated the waste. Table 22 shows the estimated amount of disposed material corresponding to each activity statewide.

Table 22: Contribution of Specific Activities to Commercial Self-hauled Waste

Activity	Est. Percentage of Disposed Waste Stream	Est. Tons Disposed Statewide
Construction & Demolition	6.9%	2,758,567
Roofing	1.8%	713,913
Landscaping	0.6%	233,598
Other Commercial	7.8%	3,106,386
Totals	**17.2%**	**6,812,464**

Numbers may not total exactly due to rounding.

An average of 28 samples was obtained from each of the five regions of the state. See Appendix A: Detailed Methodology for a description of the methods used in selecting, sorting, and analyzing samples. Table 23 presents the numbers of samples that were obtained in each region and each season. In total, 139 samples of commercial self-hauled waste were sorted.

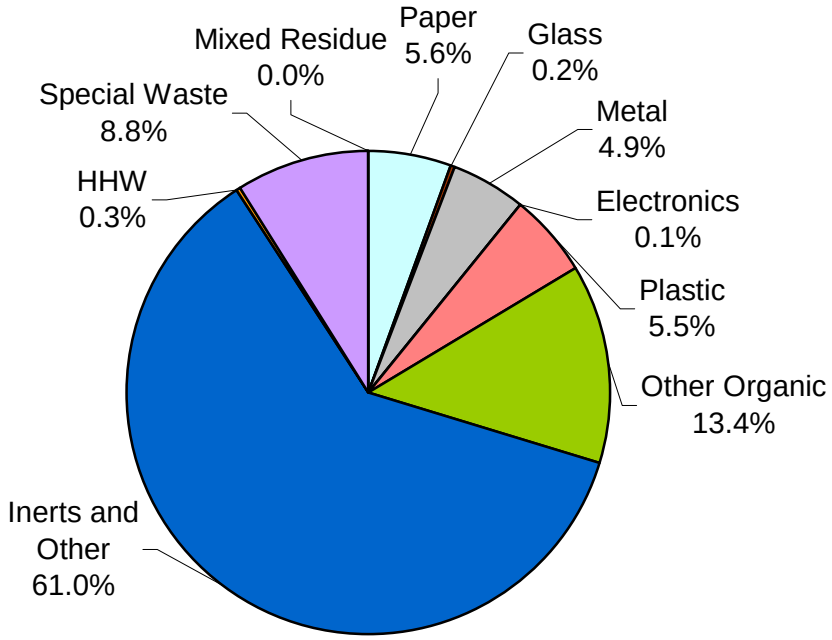
Table 23: Commercial Self-hauled Samples Obtained, by Region and Season

Season	Bay Area	Coastal	Mountain	Southern	Valley	Totals
Winter 2008	5	5	5	11	6	**32**
Spring 2008	11	6	3	8	8	**36**
Summer 2008	4	7	5	12	8	**36**
Autumn 2008	10	9	6	4	6	**35**
Totals	**30**	**27**	**19**	**35**	**28**	**139**

See Appendix A: Detailed Methodology for the names and locations of the solid waste facilities that were visited.

Composition results by **Material Class** for commercial self-hauled waste are illustrated in Figure 11 and described in detail in Table 25. An estimated 61 percent of the commercial self-hauled waste stream was comprised of the class **Inerts and Other**.

Figure 11: Overview of Commercial Self-hauled Disposed Waste



Material Class	Est. Percent
Paper	5.6%
Glass	0.2%
Metal	4.9%
Electronics	0.1%
Plastic	5.5%
Other Organic	13.4%
Inerts and Other	61.0%
HHW	0.3%
Special Waste	8.8%
Mixed Residue	0.0%
Total	**100%**

Numbers may not total exactly due to rounding.

Ten Most Prevalent Materials

Table 24 shows the 10 most prevalent *material types* of the commercial self-hauled waste stream, by weight. *Lumber*, *asphalt roofing*, *gypsum board*, and *other ferrous metal* are readily recyclable and, together, account for about 39 percent of this waste stream.

Table 24: Ten Most Prevalent Material Types in Commercial Self-hauled Disposed Waste

Material	Est. Percent	Cum. Percent	Est. Tons
Lumber	23.3%	23.3%	1,586,923
Remainder/Composite Inerts and Other	10.9%	34.2%	742,415
Rock, Soil and Fines	10.2%	44.4%	694,103
Asphalt Roofing	9.2%	53.6%	625,732
Bulky Items	8.8%	62.3%	597,335
Carpet	3.9%	66.2%	266,518
Gypsum Board	3.8%	70.0%	257,269
Other Ferrous	3.0%	73.0%	201,107
Leaves and Grass	2.7%	75.7%	186,928
Durable Plastic Items	2.4%	78.1%	163,400
Total	**78.1%**		**5,321,729**

Any differences between *cumulative percent* figures and the sum of *estimated percent* figures are due to rounding.

Detailed Composition

Table 25 presents the detailed composition results for the commercial self-hauled subsector. Tables containing data for the 85 expanded *material types* can be found in Appendix D: Expanded Statewide Waste Characterization Tables.

Table 25: Composition of Commercial Self-hauled Disposed Waste

Material	Est. Percent	+ / -	Est. Tons	Material	Est. Percent	+ / -	Est. Tons
Paper	**5.6%**		**384,854**	**Other Organic**	**13.4%**		**915,720**
Uncoated Corrugated Cardboard	2.0%	0.8%	134,247	Food	0.9%	0.5%	63,049
Paper Bags	0.3%	0.3%	22,558	Leaves and Grass	2.7%	1.3%	186,928
Newspaper	0.3%	0.3%	18,148	Prunings and Trimmings	2.3%	1.4%	155,697
White Ledger Paper	0.2%	0.2%	11,966	Branches and Stumps	1.8%	1.7%	120,016
Other Office Paper	0.2%	0.3%	16,265	Manures	0.0%	0.0%	0
Magazines and Catalogs	0.1%	0.1%	8,234	Textiles	0.9%	0.5%	63,784
Phone Books and Directories	0.0%	0.0%	0	Carpet	3.9%	2.8%	266,518
Other Miscellaneous Paper	0.9%	1.0%	64,022	Remainder/Composite Organic	0.9%	0.4%	59,729
Remainder/Composite Paper	1.6%	0.9%	109,413				
				Inerts and Other	**61.0%**		**4,155,221**
Glass	**0.2%**		**16,107**	Concrete	2.1%	1.3%	145,871
Clear Glass Bottles and Containers	0.0%	0.0%	1,722	Asphalt Paving	1.5%	2.3%	102,909
Green Glass Bottles and Containers	0.0%	0.0%	1,172	Asphalt Roofing	9.2%	4.2%	625,732
Brown Glass Bottles and Containers	0.0%	0.0%	679	Lumber	23.3%	6.5%	1,586,923
Other Colored Glass Bottles and Containers	0.0%	0.1%	2,766	Gypsum Board	3.8%	2.0%	257,269
Flat Glass	0.1%	0.1%	5,740	Rock, Soil and Fines	10.2%	5.0%	694,103
Remainder/Composite Glass	0.1%	0.0%	4,027	Remainder/Composite Inerts and Other	10.9%	4.3%	742,415
Metal	**4.9%**		**333,090**	**Household Hazardous Waste (HHW)**	**0.3%**		**23,427**
Tin/Steel Cans	0.1%	0.0%	4,257	Paint	0.0%	0.0%	1,851
Major Appliances	0.0%	0.0%	0	Vehicle and Equipment Fluids	0.0%	0.0%	684
Used Oil Filters	0.0%	0.0%	267	Used Oil	0.0%	0.0%	185
Other Ferrous	3.0%	1.1%	201,107	Batteries	0.0%	0.0%	818
Aluminum Cans	0.0%	0.0%	1,006	Remainder/Composite Household Hazardous	0.3%	0.4%	19,888
Other Non-Ferrous	0.1%	0.1%	4,987				
Remainder/Composite Metal	1.8%	1.3%	121,467	**Special Waste**	**8.8%**		**598,930**
				Ash	0.0%	0.0%	965
Electronics	**0.1%**		**6,259**	Treated Medical Waste	0.0%	0.0%	0
Brown Goods	0.0%	0.1%	2,496	Bulky Items	8.8%	4.3%	597,335
Computer-related Electronics	0.0%	0.0%	1,589	Tires	0.0%	0.0%	629
Other Small Consumer Electronics	0.0%	0.0%	374	Remainder/Composite Special Waste	0.0%	0.0%	0
Video Display Devices	0.0%	0.0%	1,799				
				Mixed Residue	**0.0%**		**812**
Plastic	**5.5%**		**378,044**	Mixed Residue	0.0%	0.0%	812
PETE Containers	0.0%	0.0%	3,169				
HDPE Containers	0.0%	0.0%	2,757				
Miscellaneous Plastic Containers	0.0%	0.0%	1,506				
Plastic Trash Bags	0.3%	0.1%	17,042				
Plastic Grocery and Other Merchandise Bags	0.0%	0.0%	1,998				
Non-Bag Commercial and Industrial Packaging Film	0.3%	0.2%	23,625				
Film Products	1.0%	1.0%	66,026				
Other Film	0.1%	0.1%	10,031				
Durable Plastic Items	2.4%	1.5%	163,400	**Totals**	**100.0%**		**6,812,464**
Remainder/Composite Plastic	1.3%	1.0%	88,489	**Sample Count**	**139**		

Confidence intervals calculated at the 90% confidence level. Percentages for material types may not total 100% due to rounding.
More detailed composition tables can be found in Appendix D: Expanded Statewide Waste Characterization Tables

Residential Self-hauled Waste

The objective of this portion of the study was to characterize California's residential self-hauled waste stream at the state level. This subsector includes waste that is hauled to a solid waste disposal site by a resident from their home.

Overview and Analysis

Samples of residential self-hauled waste were obtained from randomly selected vehicles at the landfills and transfer stations visited in this study. An average of 22 samples was obtained from each of the five regions of the state. See Appendix A: Detailed Methodology for a description of the methods used in selecting, sorting, and analyzing samples.

Table 26 presents the numbers of samples that were obtained in each region and each season. Overall, 111 samples of residential self-hauled waste were sorted.

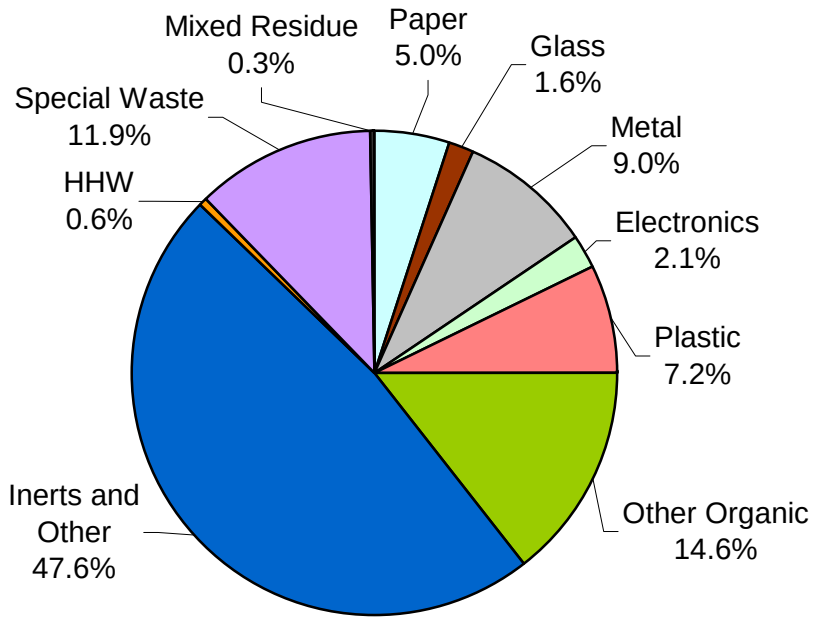
Table 26: Residential Self-hauled Samples Obtained, by Region and Season

Season	Bay Area	Coastal	Mountain	Southern	Valley	Totals
Winter 2008	5	3	10	5	3	**26**
Spring 2008	5	11	7	3	6	**32**
Summer 2008	4	4	9	3	1	**21**
Autumn 2008	6	5	5	4	12	**32**
Totals	**20**	**23**	**31**	**15**	**22**	**111**

See Appendix A: Detailed Methodology for the names and locations of the solid waste facilities that were visited.

Composition results by **Material Class** for residential self-hauled waste are illustrated in Figure 12 and described in detail in Table 28. Nearly half (48 percent) of the residential self-hauled waste was comprised of **Inerts and Other** *material types*.

Figure 12: Overview of Residential Self-hauled Disposed Waste



Material Class	Est. Percent
Paper	5.0%
Glass	1.6%
Metal	9.0%
Electronics	2.1%
Plastic	7.2%
Other Organic	14.6%
Inerts and Other	47.6%
HHW	0.6%
Special Waste	11.9%
Mixed Residue	0.3%
Total	**100%**

Numbers may not total exactly due to rounding.

Ten Most Prevalent Materials

Table 27 lists the 10 most prevalent *material types* for the residential self-hauled waste stream. *Lumber*, *concrete*, *gypsum board*, and *other ferrous metal* are all typically recyclable and, together, make up about 39 percent of the waste from the residential self-hauled waste stream.

Table 27: Ten Most Prevalent Material Types in Residential Self-hauled Disposed Waste

Material	Est. Percent	Cum. Percent	Est. Tons
Lumber	22.6%	22.6%	294,995
Bulky Items	11.7%	34.4%	152,612
Concrete	8.2%	42.6%	106,903
Remainder/Composite Inerts and Other	7.5%	50.1%	98,139
Remainder/Composite Metal	4.4%	54.5%	57,589
Gypsum Board	4.3%	58.8%	55,955
Other Ferrous	4.1%	62.9%	52,980
Durable Plastic Items	3.7%	66.5%	47,686
Carpet	3.3%	69.8%	42,853
Textiles	2.8%	72.7%	36,810
Total	**72.7%**		**946,520**

Any differences between *cumulative percent* figures and the sum of *estimated percent* figures are due to rounding.

Detailed Composition

Table 28 presents the detailed composition results for the residential self-hauled subsector. Tables containing data for the 85 expanded *material types* can be found in Appendix D: Expanded Statewide Waste Characterization Tables.

Table 28: Composition of Residential Self-hauled Disposed Waste

Material	Est. Percent	+ / -	Est. Tons	Material	Est. Percent	+ / -	Est. Tons
Paper	**5.0%**		**64,685**	**Other Organic**	**14.6%**		**189,898**
Uncoated Corrugated Cardboard	1.9%	0.6%	25,062	Food	2.2%	0.8%	28,226
Paper Bags	0.1%	0.1%	1,844	Leaves and Grass	2.0%	1.1%	25,632
Newspaper	0.3%	0.1%	3,378	Prunings and Trimmings	1.5%	1.6%	19,731
White Ledger Paper	0.1%	0.0%	1,042	Branches and Stumps	0.6%	0.8%	8,269
Other Office Paper	0.2%	0.1%	2,530	Manures	0.0%	0.0%	0
Magazines and Catalogs	0.3%	0.1%	3,576	Textiles	2.8%	1.2%	36,810
Phone Books and Directories	0.1%	0.1%	999	Carpet	3.3%	2.4%	42,853
Other Miscellaneous Paper	0.9%	0.3%	12,108	Remainder/Composite Organic	2.2%	0.9%	28,377
Remainder/Composite Paper	1.1%	0.4%	14,145				
				Inerts and Other	**47.6%**		**620,485**
Glass	**1.6%**		**21,257**	Concrete	8.2%	6.0%	106,903
Clear Glass Bottles and Containers	0.2%	0.1%	2,529	Asphalt Paving	1.7%	2.5%	21,595
Green Glass Bottles and Containers	0.0%	0.0%	368	Asphalt Roofing	1.4%	1.6%	18,503
Brown Glass Bottles and Containers	0.1%	0.1%	1,505	Lumber	22.6%	5.0%	294,995
Other Colored Glass Bottles and Containers	0.0%	0.0%	373	Gypsum Board	4.3%	3.5%	55,955
Flat Glass	0.8%	0.8%	10,108	Rock, Soil and Fines	1.9%	1.5%	24,396
Remainder/Composite Glass	0.5%	0.3%	6,376	Remainder/Composite Inerts and Other	7.5%	3.2%	98,139
Metal	**9.0%**		**117,800**	**Household Hazardous Waste (HHW)**	**0.6%**		**8,201**
Tin/Steel Cans	0.2%	0.1%	2,439	Paint	0.1%	0.2%	1,641
Major Appliances	0.0%	0.0%	0	Vehicle and Equipment Fluids	0.0%	0.0%	412
Used Oil Filters	0.0%	0.0%	97	Used Oil	0.0%	0.0%	173
Other Ferrous	4.1%	1.5%	52,980	Batteries	0.0%	0.0%	120
Aluminum Cans	0.0%	0.0%	483	Remainder/Composite Household Hazardous	0.4%	0.5%	5,855
Other Non-Ferrous	0.3%	0.3%	4,212				
Remainder/Composite Metal	4.4%	2.3%	57,589	**Special Waste**	**11.9%**		**155,445**
				Ash	0.0%	0.1%	497
Electronics	**2.1%**		**27,066**	Treated Medical Waste	0.0%	0.0%	0
Brown Goods	0.6%	0.4%	7,224	Bulky Items	11.7%	4.2%	152,612
Computer-related Electronics	1.3%	2.2%	17,299	Tires	0.1%	0.1%	1,280
Other Small Consumer Electronics	0.0%	0.0%	310	Remainder/Composite Special Waste	0.1%	0.1%	1,056
Video Display Devices	0.2%	0.2%	2,232				
				Mixed Residue	**0.3%**		**4,058**
Plastic	**7.2%**		**93,738**	Mixed Residue	0.3%	0.2%	4,058
PETE Containers	0.2%	0.1%	2,128				
HDPE Containers	0.1%	0.1%	1,915				
Miscellaneous Plastic Containers	0.2%	0.2%	2,772				
Plastic Trash Bags	0.2%	0.1%	2,416				
Plastic Grocery and Other Merchandise Bags	0.1%	0.0%	976				
Non-Bag Commercial and Industrial Packaging Film	0.0%	0.0%	141				
Film Products	0.2%	0.1%	2,791				
Other Film	0.5%	0.3%	6,756				
Durable Plastic Items	3.7%	1.2%	47,686	**Totals**	**100.0%**		**1,302,634**
Remainder/Composite Plastic	2.0%	1.2%	26,157	**Sample Count**	**111**		

Confidence intervals calculated at the 90% confidence level. Percentages for material types may not total 100% due to rounding.
More detailed composition tables can be found in Appendix D: Expanded Statewide Waste Characterization Tables

Organics

Table 29 groups together organic materials found in two separate **Material Classes**: **Other Organics** and **Inerts and Other**. This new grouping focuses on the *material types* that typically can be composted or mulched. *Clean dimensional lumber* and *clean pallets and crates* are subtypes of lumber which are commonly accepted for composting or mulch applications. The table shows the proportions of each material type in each sector, as well as in the overall waste stream.

Table 29: Selected Organics and Wood Waste Types, Amounts Disposed By Sector

Material Type	Est. Percent of Overall Waste	Est. Overall Tons	Est. Percent of Commercial Waste	Est. Commercial Tons	Est. Percent of Residential Waste	Est. Residential Tons	Est. Percent of Self-hauled Waste	Est. Self-hauled Tons
Food	15.5%	6,158,120	15.4%	3,032,805	25.4%	3,034,040	1.1%	91,275
Leaves and Grass	3.8%	1,512,832	3.0%	584,919	6.0%	715,353	2.6%	212,560
Prunings and Trimmings	2.7%	1,058,854	3.3%	658,051	1.9%	225,375	2.2%	175,428
Branches and Stumps	0.6%	245,830	0.5%	100,513	0.1%	17,032	1.6%	128,285
Manure	0.1%	20,373	0.0%	149	0.2%	20,224	0.0%	-
Clean Dimensional Lumber	3.0%	1,184,375	3.7%	730,278	0.6%	74,475	4.7%	379,622
Clean Engineered Wood	2.7%	1,054,198	2.8%	546,861	0.6%	71,483	5.4%	435,853
Clean Pallets and Crates	2.5%	975,866	3.8%	746,760	1.1%	130,571	1.2%	98,534
Total	**30.8%**	**12,210,447**	**32.5%**	**6,400,336**	**35.9%**	**4,288,553**	**18.8%**	**1,521,557**

Additional Research and Analysis Tasks

The primary objectives of both the 2004 and 2008 studies were to characterize and quantify the residential, commercial, and self-hauled sectors of the disposed waste stream at the statewide level. The current study also examined some specific *material types* through the following additional research and analysis tasks:

- A divertibility analysis to determine the extent and source of contamination for commonly recoverable paper, plastic, and metal materials that are encountered in waste loads at solid waste facilities;
- A laboratory analysis of asbestos in roofing materials;
- Detailed sorting of plastic bags to determine sources, in relation to a statewide plastic bag recycling program; and
- Additional vehicle surveys to quantify the amount of waste from C&D activities.

Results from the divertibility analysis, asbestos analysis, and plastic bag sorting are contained in the following sections.

Divertibility Analysis

Overview

The purpose of the divertibility analysis was to assess the extent of contamination and the source of contamination for commonly recoverable materials in a portion of the samples sorted. Approximately one in four of the residential, commercial, residential self-hauled, and commercial self-hauled samples that were collected at solid waste facilities were randomly selected for this assessment. Samples from the construction, demolition, and remodeling; roofing; and landscaping activity types were excluded from the divertibility analysis.

Samples included in the divertibility analysis were sorted just like other samples except that the 15 targeted materials were further subsorted into three categories: (a) clean, (b) contaminated during collection (load-contaminated), and (c) contaminated prior to collection (source-contaminated). Fuller explanations of these categories along with pictures of examples can be found in Appendix A: Detailed Methodology.

Table 30 shows the number of samples assessed from each sector. The *material types* assessed are listed in Table 31.

Table 30: Numbers of Samples Assessed for Contamination, by Sector and Subsector

Sector	Number of Samples
Commercial	75
Residential	72
Single-family residential	*57*
Multifamily residential	*15*
Self-hauled	47
Commercial self-hauled	*19*
Residential self-hauled	*28*
Total	**194**

Table 31: Material Types Included in the Divertibility Assessments

Material Type	
Uncoated Corrugated Cardboard	Aluminum Cans
Paper Bags	PETE Water Bottles
Newspaper	PETE Sealed Containers
White Ledger	Other PETE Containers
Other Office Paper	HDPE Containers
Other Miscellaneous Paper	#3-#7 Sealed Containers
Remainder/Composite Paper	#3-#7 Other Containers
Tin/Steel Cans	

The divertibility analysis included estimates of the percentages of each targeted material that appeared to be (a) clean, (b) contaminated during collection, and (c) contaminated prior to collection. Findings are provided below for the overall disposed waste stream as well as for the commercial, residential, and self-hauled waste sectors. See Appendix A: Detailed Methodology for a description of data analysis methods used to develop these percentages.

How Data Are Presented

For the overall disposed waste stream, and for each waste sector, data are presented in two ways:

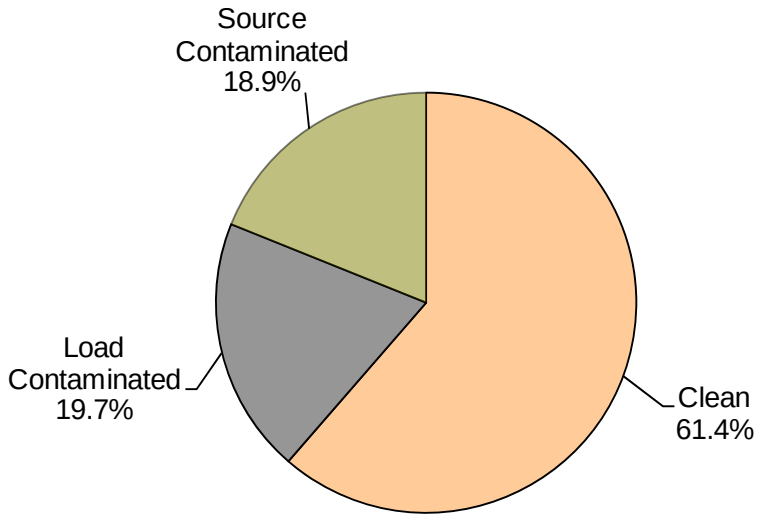
- First, an overview of waste composition by Contamination Class is presented in both pie chart and tabular formats. The first pie chart compares the proportion of clean, load-contaminated, and source-contaminated materials for the **Paper** class. The second pie chart compares the proportion of clean, load-contaminated, and source-contaminated materials for all other **Material Classes** (**Paper** is excluded).
- Next, a detailed table lists the full composition and quantity results for the 15 *material types* included in the divertibility analysis.

Overall Disposed Waste Stream

This portion of the results characterizes divertibility of certain materials found in the overall disposed solid waste stream for the entire state of California.

As shown in Figure 13 and Figure 16, almost two thirds of the disposed material in the **Paper** class, and three quarters of materials in the other **Material Classes** (including **Plastic** and **Metal**) are clean enough to be diverted. Material contaminated at the source (either at home or the workplace, depending on the load source) comprised about 19 percent of paper and 14 percent of other materials in the 194 samples assessed.

Figure 13: Contamination Source for the Paper Material Class in Overall Disposed Waste

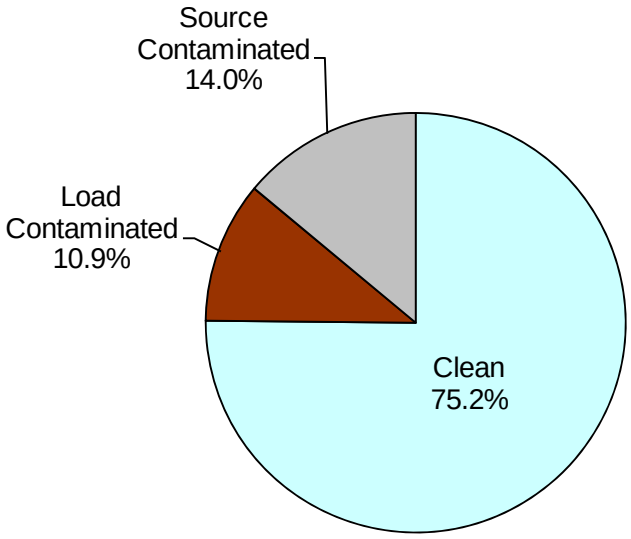


Contamination Class	Est. Percent
Clean	61.4%
Load Contaminated	19.7%
Source Contaminated	18.9%
Total	**100.0%**

Figure 14: Source-contaminated Paper

Figure 15: Clean Newspaper

Figure 16: Contamination Source for Other Material Classes in Overall Disposed Waste



Contamination Class	Est. Percent
Clean	75.2%
Load Contaminated	10.9%
Source Contaminated	14.0%
Total	**100.0%**

Figure 17: Load-contaminated Plastic

Figure 18: Clean Aluminum Cans

As Table 32 shows, nearly two-thirds of the commonly recycled materials found in the disposed waste stream are clean enough to be readily recycled. Of those clean materials, nearly one quarter is clean *uncoated corrugated cardboard*.

Table 32: Detailed Assessment of Contamination Source in Overall Disposed Waste

Material	Est. Percent	Est. Tons	Material	Est. Percent	Est. Tons
Clean Materials	**62.9%**	**4,625,916**	**Source Contaminated Materials**	**18.4%**	**1,351,037**
Uncoated Corrugated Cardboard	13.1%	960,854	Uncoated Corrugated Cardboard	0.3%	21,744
Paper Bags	1.5%	109,033	Paper Bags	0.3%	20,466
Newspaper	6.3%	460,411	Newspaper	0.0%	2,860
White Ledger Paper	3.4%	252,751	White Ledger Paper	0.0%	0
Other Office Paper	6.3%	461,304	Other Office Paper	0.0%	0
Other Miscellaneous Paper	12.9%	948,332	Other Miscellaneous Paper	0.0%	3,240
Remainder/Composite Paper	11.3%	828,489	Remainder/Composite Paper	16.2%	1,190,460
Tin/Steel Cans	2.4%	179,430	Tin/Steel Cans	0.4%	30,679
Aluminum Cans	0.6%	42,569	Aluminum Cans	0.0%	1,533
PETE Water Bottles	0.6%	45,410	PETE Water Bottles	0.0%	1,822
PETE Sealed Containers	0.1%	10,615	PETE Sealed Containers	0.0%	0
Other PETE Containers	1.4%	102,403	Other PETE Containers	0.2%	15,873
HDPE Containers	1.5%	109,631	HDPE Containers	0.3%	21,672
#3-#7 Sealed Containers	0.2%	12,861	#3-#7 Sealed Containers	0.0%	3,574
#3-#7 Other Containers	1.4%	101,823	#3-#7 Other Containers	0.5%	37,115
Load Contaminated Materials	**18.8%**	**1,379,614**	**Totals**	**100.0%**	**7,356,568**
Uncoated Corrugated Cardboard	12.6%	923,299	**Sample Count**	**194**	
Paper Bags	0.4%	26,350			
Newspaper	0.5%	36,688			
White Ledger Paper	0.1%	6,401			
Other Office Paper	0.1%	10,843			
Other Miscellaneous Paper	3.4%	250,782			
Remainder/Composite Paper	0.5%	37,596			
Tin/Steel Cans	0.4%	26,296			
Aluminum Cans	0.1%	3,727			
PETE Water Bottles	0.1%	4,474			
PETE Sealed Containers	0.1%	7,862			
Other PETE Containers	0.2%	11,184			
HDPE Containers	0.4%	26,476			
#3-#7 Sealed Containers	0.0%	1,692			
#3-#7 Other Containers	0.1%	5,943			

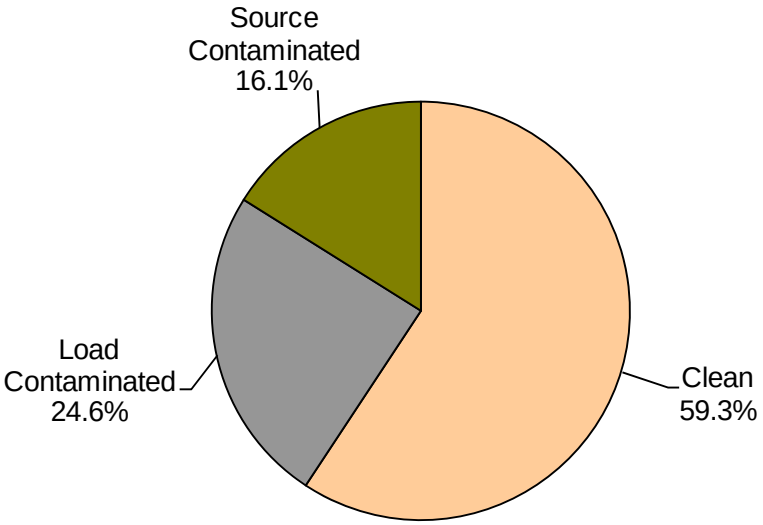
Confidence intervals calculated at the 90% confidence level. Percentages for material types may not total 100% due to rounding.

Commercial Disposed Waste Stream

This portion of the results characterizes the divertibility of certain materials found in the commercial disposed municipal solid waste stream for the state of California.

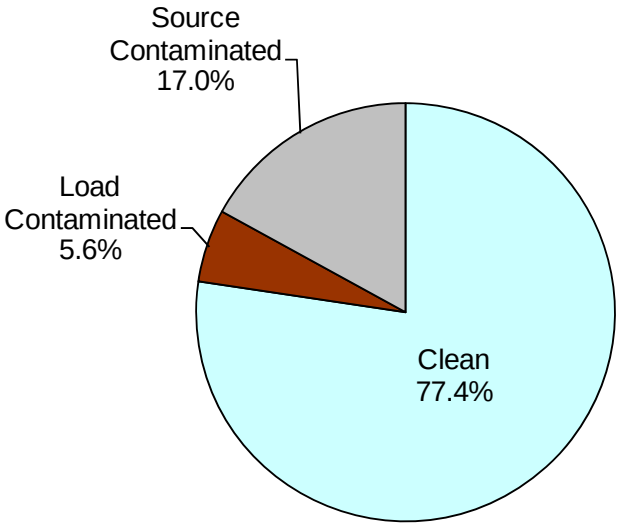
Figure 19 shows the source of contamination for materials in the **Paper** class in disposed commercial loads. Similarly, Figure 20 shows the source of contamination for materials in the other **Material Classes** in disposed commercial loads. **Paper** is less likely to be clean enough for diversion than the materials in the other **Material Classes**. Approximately one quarter of the disposed material in the **Paper** class is load-contaminated.

Figure 19: Contamination Source for the Paper Material Class in Commercial Disposed Waste



Contamination Class	Est. Percent
Clean	59.3%
Load Contaminated	24.6%
Source Contaminated	16.1%
Total	**100.0%**

Figure 20: Contamination Source for Other Material Classes in Commercial Disposed Waste



Contamination Class	Est. Percent
Clean	77.4%
Load Contaminated	5.6%
Source Contaminated	17.0%
Total	**100.0%**

Overall, nearly one quarter of the assessed materials in the commercial sector were clean enough for recovery when originally placed in a waste bin but were soiled while being transported to a disposal facility (load-contaminated). See Table 33 for the commercial disposed waste stream divertibility results.

Table 33: Detailed Assessment of Contamination Source in Commercial Disposed Waste

Material	Est. Percent	Est. Tons	Material	Est. Percent	Est. Tons
Clean Materials	**60.9%**	**2,633,062**	**Source Contaminated Materials**	**16.2%**	**699,167**
Uncoated Corrugated Cardboard	12.2%	526,924	Uncoated Corrugated Cardboard	0.0%	0
Paper Bags	1.6%	67,598	Paper Bags	0.0%	0
Newspaper	4.2%	182,291	Newspaper	0.0%	0
White Ledger Paper	4.7%	202,241	White Ledger Paper	0.0%	0
Other Office Paper	5.8%	249,289	Other Office Paper	0.0%	0
Other Miscellaneous Paper	12.7%	549,642	Other Miscellaneous Paper	0.1%	3,240
Remainder/Composite Paper	12.9%	559,789	Remainder/Composite Paper	14.6%	631,019
Tin/Steel Cans	2.0%	87,132	Tin/Steel Cans	0.6%	25,739
Aluminum Cans	0.4%	17,942	Aluminum Cans	0.0%	1,398
PETE Water Bottles	0.5%	22,188	PETE Water Bottles	0.0%	450
PETE Sealed Containers	0.2%	8,153	PETE Sealed Containers	0.0%	0
Other PETE Containers	1.1%	46,415	Other PETE Containers	0.2%	8,143
HDPE Containers	1.2%	52,382	HDPE Containers	0.2%	7,068
#3-#7 Sealed Containers	0.2%	8,529	#3-#7 Sealed Containers	0.0%	1,906
#3-#7 Other Containers	1.2%	52,548	#3-#7 Other Containers	0.5%	20,204
Load Contaminated Materials	**23.0%**	**992,730**	**Totals**	**100.0%**	**4,324,960**
Uncoated Corrugated Cardboard	20.7%	896,606	**Sample Count**	**75**	
Paper Bags	0.1%	4,143			
Newspaper	0.2%	7,945			
White Ledger Paper	0.0%	551			
Other Office Paper	0.0%	167			
Other Miscellaneous Paper	0.8%	34,355			
Remainder/Composite Paper	0.6%	27,463			
Tin/Steel Cans	0.0%	918			
Aluminum Cans	0.0%	828			
PETE Water Bottles	0.0%	1,915			
PETE Sealed Containers	0.0%	1			
Other PETE Containers	0.0%	1,914			
HDPE Containers	0.3%	14,811			
#3-#7 Sealed Containers	0.0%	687			
#3-#7 Other Containers	0.0%	427			

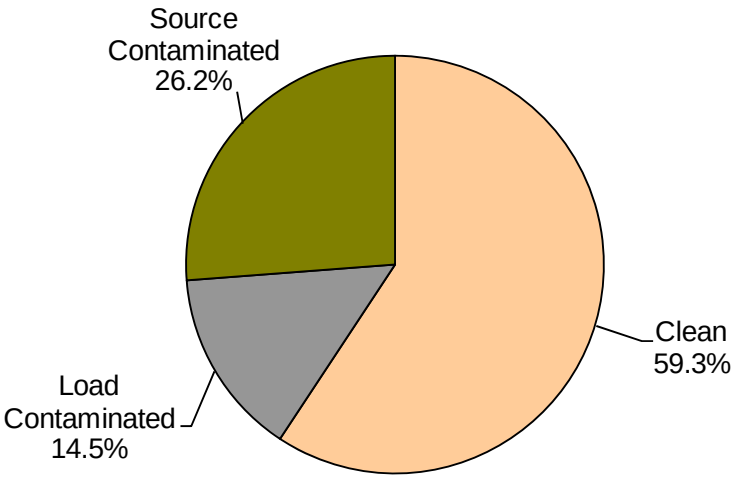
Confidence intervals calculated at the 90% confidence level. Percentages for material types may not total 100% due to rounding.

Overall Residential Disposed Waste Stream

This section characterizes the divertibility of certain materials found in the overall disposed residential solid waste stream.

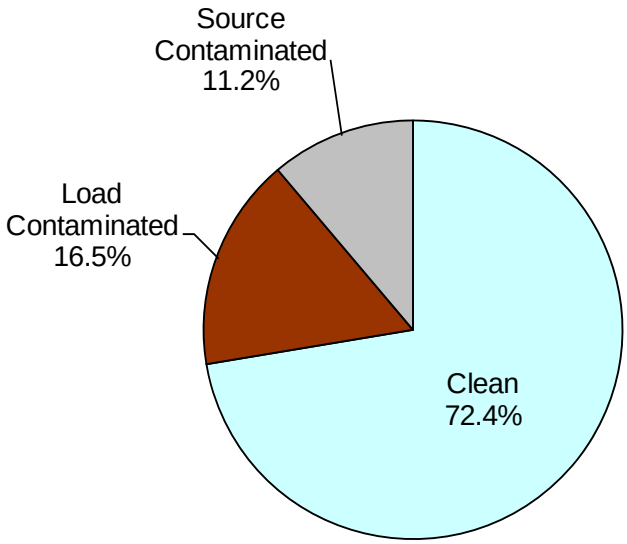
Figure 21 and Figure 22 show the source of contamination in disposed residential loads for materials in the **Paper** class and other **Material Classes**, respectively. Nearly 60 percent of the disposed material in the **Paper** class is clean enough for recovery.

Figure 21: Contamination Source for the Paper Material Class in Residential Disposed Waste



Contamination Class	Est. Percent
Clean	59.3%
Load Contaminated	14.5%
Source Contaminated	26.2%
Total	**100.0%**

Figure 22: Contamination Source for Other Material Classes in Residential Disposed Waste



Contamination Class	Est. Percent
Clean	72.4%
Load Contaminated	16.5%
Source Contaminated	11.2%
Total	**100.0%**

As shown in Table 34, source contaminated *remainder/composite paper* is the most common included *material type*, comprising more than 20 percent of all the materials assessed.

Table 34: Detailed Assessment of Contamination Source in Residential Disposed Waste

Material	Est. Percent	Est. Tons	Material	Est. Percent	Est. Tons
Clean Materials	**61.3%**	**1,577,363**	**Source Contaminated Materials**	**23.9%**	**613,828**
Uncoated Corrugated Cardboard	10.8%	277,360	Uncoated Corrugated Cardboard	0.8%	20,182
Paper Bags	1.6%	40,750	Paper Bags	0.0%	116
Newspaper	10.0%	257,025	Newspaper	0.1%	2,860
White Ledger Paper	1.5%	37,502	White Ledger Paper	0.0%	0
Other Office Paper	7.5%	193,220	Other Office Paper	0.0%	0
Other Miscellaneous Paper	12.5%	322,753	Other Miscellaneous Paper	0.0%	0
Remainder/Composite Paper	6.2%	158,879	Remainder/Composite Paper	21.2%	545,933
Tin/Steel Cans	3.3%	85,621	Tin/Steel Cans	0.2%	4,924
Aluminum Cans	0.9%	23,156	Aluminum Cans	0.0%	117
PETE Water Bottles	0.8%	21,835	PETE Water Bottles	0.1%	1,372
PETE Sealed Containers	0.1%	2,084	PETE Sealed Containers	0.0%	0
Other PETE Containers	2.1%	52,945	Other PETE Containers	0.3%	7,314
HDPE Containers	2.0%	52,579	HDPE Containers	0.6%	14,604
#3-#7 Sealed Containers	0.1%	3,812	#3-#7 Sealed Containers	0.1%	1,668
#3-#7 Other Containers	1.9%	47,842	#3-#7 Other Containers	0.6%	14,736
Load Contaminated Materials	**14.8%**	**381,257**	**Totals**	**100.0%**	**2,572,448**
Uncoated Corrugated Cardboard	1.0%	25,516	**Sample Count**	**72**	
Paper Bags	0.7%	18,838			
Newspaper	1.1%	28,311			
White Ledger Paper	0.2%	5,850			
Other Office Paper	0.4%	10,675			
Other Miscellaneous Paper	8.4%	216,236			
Remainder/Composite Paper	0.4%	9,904			
Tin/Steel Cans	1.0%	25,375			
Aluminum Cans	0.1%	2,899			
PETE Water Bottles	0.1%	2,560			
PETE Sealed Containers	0.3%	7,861			
Other PETE Containers	0.4%	9,199			
HDPE Containers	0.5%	11,662			
#3-#7 Sealed Containers	0.0%	1,005			
#3-#7 Other Containers	0.2%	5,365			

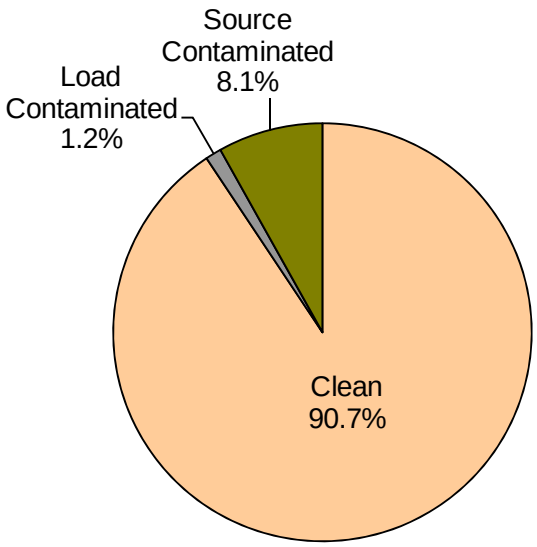
Confidence intervals calculated at the 90% confidence level. Percentages for material types may not total 100% due to rounding.

Overall Self-hauled Disposed Waste Stream

This section characterizes the divertibility of certain materials found in the overall self-hauled solid waste stream, combining the commercial self-hauled and residential self-hauled subsectors.

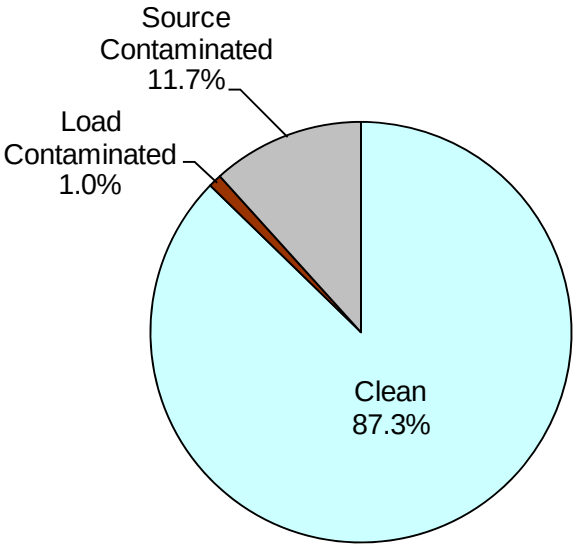
As shown in Figure 23 and Figure 24, source contamination is more common than load contamination in the self-hauled sector. Even so, about 90 percent of assessed materials are clean when they are unloaded at a disposal facility.

Figure 23: Contamination Source for the Paper Material Class in Self-hauled Disposed Waste



Contamination Class	Est. Percent
Clean	90.7%
Load Contaminated	1.2%
Source Contaminated	8.1%
Total	**100.0%**

Figure 24: Contamination Source for Other Material Classes in Self-hauled Disposed Waste



Contamination Class	Est. Percent
Clean	87.3%
Load Contaminated	1.0%
Source Contaminated	11.7%
Total	**100.0%**

Clean *uncoated corrugated cardboard* is the most prevalent of the assessed materials in the self-hauled sector, comprising more than one third of the materials. Overall, more than 90 percent of the assessed materials in the self-hauled sector are clean enough for recovery at the time they are unloaded at a disposal site. Table 35 presents the detailed divertibility results for the self-hauled disposed waste stream.

Table 35: Detailed Assessment of Contamination Source in Self-hauled Disposed Waste

Material	Est. Percent	Est. Tons	Material	Est. Percent	Est. Tons
Clean Materials	**90.5%**	**415,491**	**Source Contaminated Materials**	**8.3%**	**38,043**
Uncoated Corrugated Cardboard	34.1%	156,570	Uncoated Corrugated Cardboard	0.3%	1,561
Paper Bags	0.1%	684	Paper Bags	4.4%	20,349
Newspaper	4.6%	21,095	Newspaper	0.0%	0
White Ledger Paper	2.8%	13,008	White Ledger Paper	0.0%	0
Other Office Paper	4.1%	18,795	Other Office Paper	0.0%	0
Other Miscellaneous Paper	16.5%	75,938	Other Miscellaneous Paper	0.0%	0
Remainder/Composite Paper	23.9%	109,821	Remainder/Composite Paper	2.9%	13,508
Tin/Steel Cans	1.5%	6,677	Tin/Steel Cans	0.0%	15
Aluminum Cans	0.3%	1,471	Aluminum Cans	0.0%	18
PETE Water Bottles	0.3%	1,387	PETE Water Bottles	0.0%	0
PETE Sealed Containers	0.1%	378	PETE Sealed Containers	0.0%	0
Other PETE Containers	0.7%	3,044	Other PETE Containers	0.1%	416
HDPE Containers	1.0%	4,670	HDPE Containers	0.0%	0
#3-#7 Sealed Containers	0.1%	521	#3-#7 Sealed Containers	0.0%	0
#3-#7 Other Containers	0.3%	1,432	#3-#7 Other Containers	0.5%	2,175
Load Contaminated Materials	**1.2%**	**5,626**	**Totals**	**100.0%**	**459,160**
Uncoated Corrugated Cardboard	0.3%	1,177	**Sample Count**	**47**	
Paper Bags	0.7%	3,369			
Newspaper	0.1%	432			
White Ledger Paper	0.0%	0			
Other Office Paper	0.0%	0			
Other Miscellaneous Paper	0.0%	192			
Remainder/Composite Paper	0.1%	230			
Tin/Steel Cans	0.0%	3			
Aluminum Cans	0.0%	0			
PETE Water Bottles	0.0%	0			
PETE Sealed Containers	0.0%	0			
Other PETE Containers	0.0%	71			
HDPE Containers	0.0%	2			
#3-#7 Sealed Containers	0.0%	0			
#3-#7 Other Containers	0.0%	150			

Confidence intervals calculated at the 90% confidence level. Percentages for material types may not total 100% due to rounding.

Laboratory Analysis of Asbestos in Roofing Loads

Overview

The purpose of this analysis was to measure the incidence of asbestos-containing materials in disposed roofing. Samples of *asphalt composition shingles, roofing tar paper/felt, roofing mastic, built-up roofing*, and *other asphalt roofing material* were collected and tested for asbestos by an independent accredited laboratory using polarized light microscopy. These materials are traditionally believed to be the source of nearly all asbestos found in roofing waste, though the use of asbestos in roofing manufacturing was limited.

Figure 25: Two Shingle Types In the Same Load

A total of 191 material samples were collected and analyzed from 88 loads. Of the samples tested, a single sample of *roofing mastic* collected during the Autumn season tested positive for the presence of asbestos. Appendix A: Detailed Methodology contains a thorough description of the roofing materials collection and analysis process.

Table 36 shows the total number of loads in which roofing materials were sampled, while Table 37 shows the total number of samples submitted for asbestos testing. About two samples per load were submitted for asbestos testing. Self-hauled loads were sampled most frequently and provided the greatest variety of *material types* for sampling.

Table 36: Number of Roofing Loads Sampled, by Sector

Sector	Number of Sampled Loads
Commercial	9
Residential	5
Self-hauled	74
Total	**88**

Table 37: Number of Roofing Samples Tested, by Material Type and Sector

Sector	Composition Shingles	Tar Paper/ Felt	Roofing Mastic	Built Up Roofing	Other Asphalt Roofing	Total
Commercial	9	5	0	0	1	**15**
Residential	6	3	0	0	0	**9**
Self-hauled	82	68	5	9	3	**167**
Total	**97**	**76**	**5**	**9**	**4**	**191**

Plastic Bags

California's At-Store Recycling Program for plastic carryout bags requires large grocery stores and retailers with pharmacies to provide drop-off recycling service for grocery and merchandise bags. Part of the waste characterization study consisted of further sorting of *plastic grocery and other merchandise bags* into four subtypes:

- Bags from grocery stores;
- Bags from retailers with large pharmacies;
- Bags from retailers other than those listed above; and
- Bags whose source could not be determined

During field sampling, for 100 randomly chosen samples, materials sorted as *plastic grocery and other merchandise bags* were set aside for more detailed sorting. Fifty samples came from the residential sector and 50 from the commercial sector, with one of each taken every day during field work so that all facilities were represented. A total of 70 pounds of bags were sorted. The results are shown in Table 38.

Table 38: Results of Plastic Bag Sorting

Plastic Bag Type	Percent of plastic grocery and other merchandise bags by weight
Bags from grocery stores	44
Bags from retailers with large pharmacies	14
Bags from retailers other than those listed above	23
Bags whose source could not be determined	19
Total	**100**

C&D Survey

During the vehicle survey, additional information was collected from drivers to identify loads coming from C&D activities. The sector of origin and weight of load was also determined, as part of the regular vehicle survey procedure. Results showed that overall, 16 percent of the state's disposed waste comes from C&D activities. For single-family residential waste about nine percent is from C&D activities, and for the commercial sector the proportion is about 11 percent. In the self-hauled sector, 51 percent of commercial self-hauled waste and 12 percent of residential self-hauled waste come from C&D activities.

Appendix A: Detailed Methodology

Overview

This appendix describes the major elements of the study methodology, ranging from the initial selection of locations for sampling and surveying, to the sampling and surveying procedures, to the data analysis approach.

Planning and carrying out a waste characterization study is challenging. These studies seek to apply pure statistical methods within the real-world limitations imposed by budgetary considerations and the day-to-day operations of solid waste transfer and solid waste disposal sites. This study sought to find the proper balance: a statistically valid analysis that was cost-effective and a process for gathering data that was not disruptive to facility operators or their customers.

Definition of Regions, Waste Sectors and Subsectors

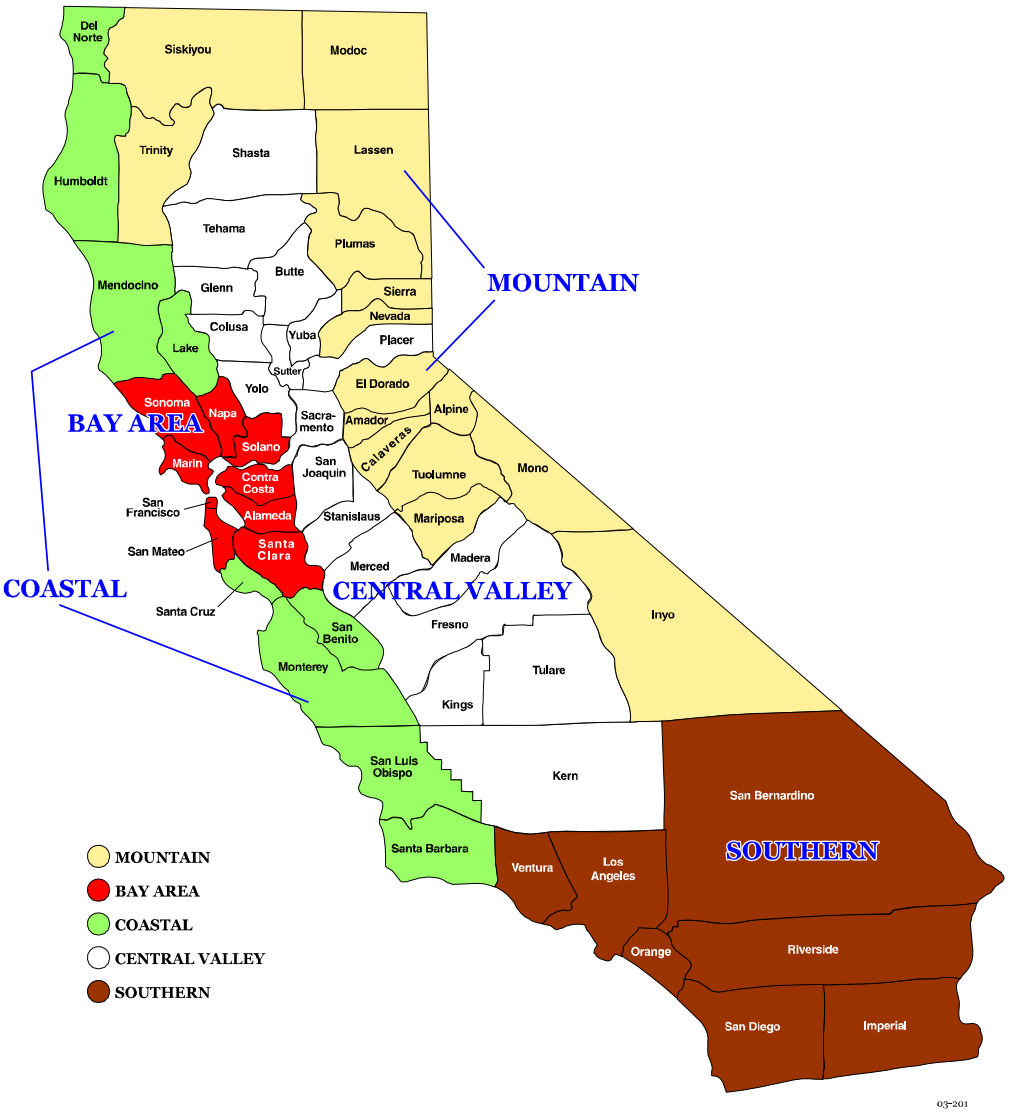
Description and definitions of the waste sectors and regions used to stratify data collection for the 2008 study are presented in the following sections.

Selection of Regions

This study divided California into five regions to account for any regional variations in waste composition. A random sampling methodology was used to select the facilities at which data were collected within each region. In addition, three extra large sites were selected in each region for gate surveys only (see below). The stratified sampling plan initially targeted an equal number of samples for each region in order to ensure that the information collected would be comparable statewide and that it would represent the breadth of communities within the state. The regions are shown graphically in Figure 26, and the counties within each region are cited in Table 39.

For more background on how the regions were defined, see Appendix A of the 1999 Statewide Waste Characterization Study (available at www.ciwmb.ca.gov/Publications/default.asp?pubid=824). Some of the regions in this study were modified slightly from the 1999 study, but they match the regions used in the 2004 study.

Figure 26: Regions Considered in the Study



The five regions shown above are defined as follows:

- **Bay Area**: Includes the counties in the San Francisco Bay Area, which are more metropolitan than other counties in other regions, and have strong industrial components in the economy.
- **Coastal**: Includes the counties on the coast that are not in either the Bay Area or Southern regions. The coastal region is more populated than the rural mountain region and has a large agricultural component similar to the Central Valley.
- **Mountain**: Includes counties mainly in the eastern part of the state that are primarily rural, with strong agricultural economies, low population density, and a low industrial base.

- **Southern**: Includes counties in the southern part of the state that are strongly industrial with large populations and some agricultural influences.
- **Central Valley**: Includes counties between the Sierra Nevada Mountains and the Coast Range that have a major agricultural base with important population centers and some manufacturing.

Table 39: Counties in the Five Sampling Regions

Bay Area	Coastal	Mountain	Southern	Central Valley
Alameda	Del Norte	Alpine	Imperial	Butte
Contra Costa	Humboldt	Amador	Los Angeles	Colusa
Marin	Lake	Calaveras	Orange	Fresno
Napa	Mendocino	El Dorado	Riverside	Glenn
San Francisco	Monterey	Inyo	San Bernardino	Kern
San Mateo	San Benito	Lassen	San Diego	Kings
Santa Clara	San Luis Obispo	Mariposa	Ventura	Madera
Solano	Santa Barbara	Modoc		Merced
Sonoma	Santa Cruz	Mono		Placer
		Nevada		Sacramento
		Plumas		San Joaquin
		Sierra		Shasta
		Siskiyou		Stanislaus
		Trinity		Sutter
		Tuolumne		Tehama
				Tulare
				Yolo
				Yuba

Waste Sectors

In each of the five regions, waste was characterized for the three sectors, four subsectors, and four activities, as shown in Figure 27 below.

Figure 27: Overview of Waste Disposal Sectors and Subsectors

Sector Subsector *Activity*	**Description**
Commercial waste	**Waste disposed by businesses, industries (e.g., factories, farms), institutions, and governments (e.g., schools, highways, parks) that is collected and transported by contracted and franchised haulers**
Residential Waste	**Waste disposed by households that is collected and transported by contracted and franchised haulers**
Single-family residential waste	Waste that is collected from either single-family residences or buildings that include no more than four living units
Multifamily residential waste	Waste that is collected from multi-unit buildings with greater than four living units
Self-hauled waste	**Waste hauled by individuals, businesses, or government agencies that haul their own garbage; includes waste delivered by anyone other than a contracted or franchised hauler**
Commercial self-hauled waste	Waste that is hauled to a disposal site by a commercial enterprise (e.g., landscaper, contractor) even if waste is from residential dwellings
Construction, demolition and remodeling waste	*Waste generated during the construction, demolition, or remodeling of buildings by construction professionals*
Roofing waste	*Waste generated during the installation or replacement of roofs, including tear-off, by roofing professionals*
Landscaping waste	*Waste generated as part of landscaping and other yard care activities by landscaping professionals*
Other commercial and industrial self-hauled waste	*All waste generated at businesses or institutions and hauled by these businesses that is not construction, demolition, or remodeling; landscaping; or roofing waste*
Self-hauled residential waste	Waste that is hauled to a disposal site by a resident from his or her home

Selection of and Scheduling and Logistics at Solid Waste Facilities and Multifamily Sites

A stratified random sampling methodology was used to sample waste from numerous subgroups (strata such as geographical region and waste sector) to develop a waste composition profile for each stratum. The strata were "added together" in a way that reflects each stratum's relative contribution to the overall waste stream, thus producing overall waste composition information.

Strata considered in this study included the geographical region, the waste sector (residential, commercial, or self-hauled), and the waste subsector (single-family residential, multifamily residential, residential self-hauled, and commercial self-hauled). Waste from the multifamily subsector was sampled at the point of generation (i.e., at multifamily buildings with more than four units). Waste from the other sectors and subsectors was sampled at solid waste facilities.

Waste sampling and the quantification of waste through vehicle surveys occurred during four seasons to account for any seasonal variations in waste disposal patterns. Twelve or 13 sampling and sorting days were scheduled for each season. The sampling/sorting dates were:

- Winter: Jan. 14-29, 2008;
- Spring: April 8-24, 2008;
- Summer: July 16-31, 2008;
- Autumn: Nov. 6-21, 2008.

Selection and Recruitment of Sites

Solid waste facilities (landfills and transfer stations) for the study were randomly selected from a comprehensive list of facilities in the state. The goal was to recruit five facilities in each region, with the expectation that each facility would be visited twice during periods approximately six months apart. Within each region, potential sorting sites were screened for eligibility based on the following minimum criteria:

- The site handled waste destined for final disposal (waste was not subject to any further processing or sorting);
- It was possible to obtain credible tonnage data from all three waste sectors (commercial, residential, and self-hauled) at the site; and
- It was possible to perform waste sampling and sorting at the site.

Solid waste facilities were selected using the steps described below.

- Board staff assembled a complete list of solid waste facilities in the state that were believed to handle 100 tons or more of waste per day (considering only waste that had not already passed through a waste transfer station). Facilities on the list were grouped according to sampling region.
- A random number generator was used to randomize the list of facilities within each region. The first 10 candidate facilities were selected from each region's random-ordered list, for a total of 50 candidate facilities, from which five facilities in each region were to be selected.

- The facilities were then contacted by telephone in the order they appeared on the list. Facility staff were invited to participate in the study and were asked a series of questions as an eligibility screen. Screening criteria were as follows: (1) the facility had to receive an average of at least 100 tons of directly-hauled waste per operating day, [2] (2) an adequate number of vehicles from all waste streams had to be available daily to be sampled, and (3) management had to be willing to accommodate the expected waste sampling and sorting activities.
- Eligible facilities which were interested in participating were assigned alternately to either a spring-autumn or a summer-winter sampling schedule, depending on their position on the randomized list.
- If a recruited facility was later rejected (see below), the next facility in the randomly sorted list for that region was contacted.

A number of facilities initially contacted were determined to be ineligible because they received a significant amount of material being processed for recovery. Many of these facilities were not officially named as materials recovery facilities (MRFs). Many rural mountain region facilities contacted were fairly small and did not receive many loads from one or more of the desired sectors on any given day. In some cases special arrangements had to be made to collect samples from all sectors.

Samples were collected and sorted at 27 facilities (two of the original facilities were replaced due to logistical difficulties). Table 40 lists all participating facilities.

[2] This requirement was waived for the mountain region as few, if any, of the facilities in that region average 100 tons per day.

Table 40: Participating Sampling Facilities

Region	County	Facility	City	Seasons	2008 Dates
Bay Area	Solano	Potrero Hills Landfill	Suisun City	Winter/Summer	1/18 and 7/21
	Sonoma	Healdsburg Transfer	Healdsburg	Winter/Summer	1/21 and 7/16
	Santa Clara	Guadalupe Sanitary Landfill	San Jose	Spring/Autumn	4/16 and 11/13
	Contra Costa	Golden Bear Transfer	Pittsburg	Spring/Autumn	4/17 and 11/14
	Marin	Redwood Sanitary Landfill	Novato	Spring/Autumn	4/24 and 11/17
Coastal	Santa Cruz	City Of Santa Cruz Sanitary Landfill	Santa Cruz	Winter/Summer	1/22 and 7/22
	Monterey	Johnson Canyon Sanitary Landfill	Gonzales	Winter/Summer	1/23 and 7/23
	San Luis Obispo	Chicago Grade Sanitary Landfill	Templeton	Spring/Autumn	4/14 and 11/11
	Monterey	Jolon Road Sanitary Landfill	King City	Spring/Autumn	4/15 and 11/12
	Mendocino	Willits Solid Waste Transfer	Willits	Spring/Autumn	4/23 and 11/18
Mountain	Lassen	Bass Hill Sanitary Landfill	Johnstonville	Winter/Spring	1/14 and 4/21
	Nevada	McCourtney Road Transfer	Grass Valley	Winter/Summer	1/16 and 7/18
	Mariposa	Mariposa County Sanitary Landfill	Mariposa	Winter/Summer	1/24 and 7/24
	Calaveras	Rock Creek Sanitary Landfill	Milton	Spring/Autumn	4/18 and 11/20
	Mono	Benton Crossing Sanitary Landfill	Whitmore Hot Springs	Summer	7/24
	Amador	Western Amador Transfer (WARF)	Ione	Autumn	11/21
Southern	Riverside	Edom Hill Transfer	Cathedral City	Winter/Summer	1/26 and 7/29
	Los Angeles	Chiquita Canyon Sanitary Landfill	Valencia	Winter/Summer	1/28 and 7/30
	Los Angeles	Falcon Transfer	Wilmington	Winter/Summer	1/29 and 7/31
	San Diego	Sycamore Sanitary Landfill	San Diego	Spring/Autumn	4/8 and 11/6
	Riverside	Lamb Canyon Sanitary Landfill	Beaumont	Spring/Autumn	4/9 and 11/7
Valley	Yolo	Yolo County Central Sanitary Landfill	Davis	Winter/Summer	1/17 and 7/17
	Tulare	Woodville Sanitary Landfill	Tulare	Winter	1/24
	Kern	Taft Sanitary Landfill	Taft	Spring/Autumn	4/10 and 11/8
	Kern	Shafter-Wasco Sanitary Landfill	Shafter	Spring/Autumn	4/11 and 11/10
	Butte	Oroville Transfer	Oroville	Spring/Autumn	4/22 and 11/19
	Fresno	Jefferson Avenue Transfer	Fresno	Summer	7/28

Site Scheduling and Logistics

A telephone interview was conducted with personnel at each selected solid waste facility (see questionnaire in Appendix C: Forms Used in the Study). The following information was obtained through this interview:

- Written directions to the facility;
- The facility's days and hours of operation, and whether vehicles were accepted outside of those hours;
- Contact information for the owner of the facility, an employee with the authority to provide permission to use the site, staff to assist in making arrangements for data collection, an on-

site contact for logistics information, and a person to be the point of contact on the day of sampling;

- A plan or agreement about the exact location of sampling and sorting operations at the facility;
- Confirmation of the facility's willingness to make a loader available for sample collection;
- A plan for the use of scales and the cooperation of gatehouse personnel to obtain vehicle net weights;
- The number of scalehouses at the facility and the process by which vehicles are directed to the scalehouses (e.g., whether commercial haulers use a separate gate than do self-haul or cash customers);
- Approximate daily and weekly load counts and tonnage by waste sector, subsector, and total for the facility;
- Estimated vehicle traffic expected for each sector on each day of the week and the estimated peak time of day for each type of load;
- Specific information about numbers and types of vehicles arriving on weekend days;
- Any rules used for recording the net weight of vehicles and for recording alternate minimum weights for small vehicles;
- Information about existing recycling or recovery operations at the facility, and how the study team may obtain samples of waste after any recycling or recovery operations have already been applied to the waste; and
- Tips about any unusual conditions (e.g., weather, anomalies in traffic patterns) that might affect data collection.

During these conversations, the study team also explained the data collection crew's need for sorting space, assistance from a loader and operator, and access to restrooms and shelter at the facility.

Selecting Multifamily Sites

Prior to each sampling season, the study team identified apartment buildings and complexes for inclusion in the study and contacted the management of those buildings to gather information and confirm the suitability of the sites. Selected multifamily sites generally were within 15 miles of the corresponding solid waste facility where waste sampling and sorting took place. A multifamily site is defined as a building consisting of five or more dwelling units. Two multifamily sites—one primary and one backup—were identified for each sampling day. For each day, sampling arrangements were made with both the primary and backup site, although only one site ultimately was chosen to provide the day's sample of multifamily waste.

The study team contacted the management at each multifamily site to determine the exact location of each waste container that was to be included in sampling and waste generation measurements. The study team confirmed that access to each waste container was possible early on the morning of sampling or, in some cases, the night before the scheduled sampling day. A specific procedure for accessing the waste was developed for each site.

For sites where the waste containers are not normally accessible during early morning hours (for example, in a locked area), the study team made arrangements to ensure that the sampling crew would be granted access without delay. If a multifamily site could not provide the required information and guarantee that the waste containers would be accessible to the data collection crew at the time indicated, then the site was dropped from inclusion in the study. The study team also obtained the number of existing and occupied dwelling units at each selected site.

Numbers of Samples

The State of California's *Uniform Waste Characterization Method* guides the determination of the number of samples to sort from each waste sector in each region of the state. A total of 750 samples were planned to be collected over the course of the study (250 residential samples, 250 commercial samples, and 250 self-hauled samples). The number of samples in each sector was divided evenly among the five regions. The actual number of samples collected was very similar to the plan, as shown in Table 41.

Table 41: Planned vs. Actual Numbers of Waste Samples

Sector	Planned Number of Samples	Actual Number of Samples
Commercial	250	250
Residential	250	251
Single-family residential	*200*	*201*
Multifamily residential	*50*	*50*
Self-hauled	250	250
Total	**750**	**751**

Table 42 presents a detailed account of the waste samples that were characterized at each facility, in each region, and in each season.

Table 42: Waste Samples Characterized During the Study

	Season	Winter - Actual				Spring - Actual				Summer-Actual				Fall - Actual				
	Sector	SF	MF	Com	SH	SF	MF	Com	SH	SF	MF	Com	SH	SF	MF	Com	SH	Totals
Bay Area	Potrero Hills Landfill	4	1	5	5					4	1	5	5					30
	Healdsburg Transfer	4	1	5	5					4	1	7	3					30
	Guadalupe Sanitary Landfill					4	1	5	5					4	1	4	6	30
	Golden Bear Transfer					4	1	5	6					4	1	4	5	30
	Redwood Sanitary Landfill					4	1	6	5					4	1	4	5	30
Coastal	City Of Santa Cruz Sanitary Landfill	4	0	5	5					4	2	5	5					30
	Johnson Canyon Sanitary Landfill	5	2	6	3					4	0	5	6					31
	Chicago Grade Sanitary Landfill					4	1	4	6					4	1	7	3	30
	Jolon Road Sanitary Landfill					4	1	4	6					4	1	5	5	30
	Willits Solid Waste Transfer					4	1	5	5					4	1	4	6	30
Mountain	Bass Hill Sanitary Landfill	4	1	6	4	4	1	6	4									30
	McCourtney Road Transfer	4	1	5	5					4	1	5	5					30
	Mariposa County Sanitary Landfill	3	1	5	6					6	1	4	4					30
	Rock Creek Sanitary Landfill					4	1	4	6					3	1	5	6	30
	Benton Crossing Sanitary Landfill									5	1	4	5					15
	Western Amador Transfer (WARF)													3	1	6	5	15
Southern	Edom Hill Transfer	1	1	7	6					7	1	2	5					30
	Chiquita Canyon Sanitary Landfill	7	1	2	5					2	1	8	4					30
	Falcon Transfer	5	1	4	5					3	1	5	6					30
	Sycamore Sanitary Landfill					2	1	6	8					5	1	5	2	30
	Lamb Canyon Sanitary Landfill					3	1	7	3					5	1	4	6	30
Valley	Yolo County Central Sanitary Landfill	4	1	5	5					4	1	5	5					30
	Woodville Sanitary Landfill	5	1	5	4													15
	Taft Sanitary Landfill					4	1	5	5					3	1	4	7	30
	Shafter-Wasco Sanitary Landfill					4	1	5	5					4	1	5	5	30
	Oroville Transfer					4	1	6	4					4	1	4	6	30
	Jefferson Avenue Transfer									4	1	6	4					15
Totals		50	12	60	58	49	13	68	68	51	12	61	57	51	13	61	67	**751**

In addition to the traditional characterization, approximately one in four samples in each waste sector was assessed to determine the extent and point of contamination of commonly recoverable materials in the sample. The numbers of divertibility samples are presented in Table 43, below.

Table 43: Numbers of Samples Assessed for Contamination, by Sector and Subsector

Sector	Number of Samples
Commercial	75
Residential	72
Single-family residential	*57*
Multifamily residential	*15*
Self-hauled	47
Commercial self-hauled	*19*
Residential self-hauled	*28*
Total	194

Obtaining and Sorting Waste Samples

Sampling at Solid Waste Facilities

Upon arriving at each solid waste site, the team reviewed the sampling plan and sorting requirements with the site's operational staff. They verified the information collected during the telephone interview, including the most suitable area for sorting and the availability of equipment for selecting samples and transporting them to the sorting area.

DIVERTING SELECTED LOADS

A systematic selection procedure was used to identify the vehicles that provided waste samples at municipal solid waste facilities. A sampling interval for each waste sector was established to calculate vehicle sampling frequency. Sampling intervals were determined by dividing the total number of loads for each sector arriving at the facility each day—estimated from solid waste site interviews—by the number of samples needed each day. The resulting number was the sampling frequency, used to determine whether, for example, every third vehicle, every sixth vehicle, or every 20th vehicle is selected for sampling. This strategy is termed "selecting every n^{th} vehicle" within a waste sector. See Appendix C: Forms Used in the Study for an example of a *vehicle selection form* that specifies the intervals chosen for a particular day of sampling.

Every time one of the designated n^{th} vehicles in each waste sector arrived, the gate surveyor placed a *sample placard* on the vehicle's windshield or dashboard to identify it as a vehicle intended for sampling and directed the driver to the sampling area. See Appendix C: Forms Used in the Study for an example of a *sample placard*.

When the sampling crew intercepted the vehicle, the field crew supervisor recorded the information from the sample placard onto the *sample sorting and characterization form* (see Appendix C: Forms Used in the Study). The field crew supervisor also noted any unusual circumstances associated with the load or the sample.

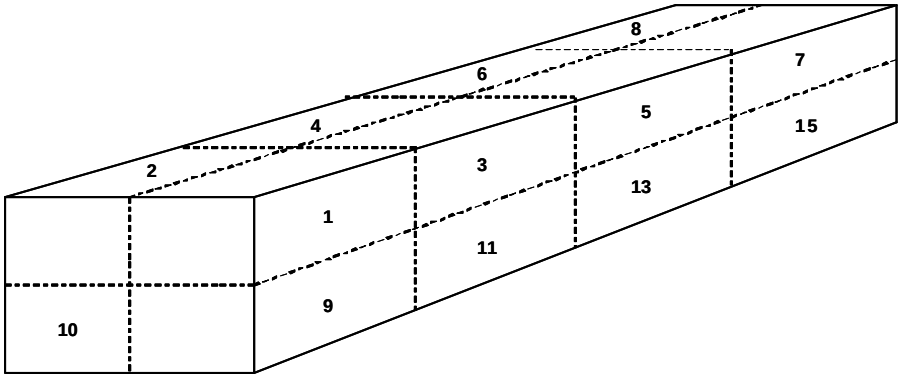
OBTAINING WASTE SAMPLES; ADEQUATE SAMPLE WEIGHTS

Each load selected for sampling was tipped into an elongated pile on the ground or the floor of the solid waste facility. The field crew supervisor then oversaw the following steps to obtain the sample:

1. **Visually divide each sample load into 16 cells.** An imaginary 16-cell grid was superimposed on the tipped load, as depicted in Figure 28 below. [3]
2. **Instruct the loader operator to capture waste from a randomly selected cell in the grid.** The desired cell number corresponding to each sample was pre-selected at random and recorded on the *sample placards* that were provided to the sampling crew. (See Appendix C: Forms Used in the Study for an example of a *sample placard*.) The field crew supervisor directed the loader operator to the randomly selected cell in the grid to obtain the waste sample.
3. **Select a sample estimated to weigh at least 200 pounds from the pile.** Material from the identified cell was placed onto a tarpaulin for sorting. In most cases, a loader was available to transport the material, but at some facilities samples were removed from the pile by hand. Prior to sorting each sample, a crew member took a digital photograph of the sample with the sample placard and identification number visible in the picture. These pictures were later incorporated into the sampling results database.

The specifications for selecting self-hauled samples were slightly different, because self-hauled loads vary greatly in size. A sample of at least 200 pounds was taken only if the entire load weighed at least 250 pounds. For loads weighing between 175 and 250 pounds, the entire load was sorted as a sample. In cases when a load weighed less than 175 pounds, additional loads from the same waste subsector (commercial self-hauled or residential self-hauled) were collected until the total weight exceeded 200 pounds. The combined loads were then sorted as one sample.

Figure 28: The 16-Cell Grid as Applied to a Tipped Load



[3] The number of cells in this grid was adjusted downward for small loads. For example, a small load could be divided into 8 cells instead of 16 to ensure that a sufficient amount of waste (at least 200 pounds per cell) was captured for sampling.

Sampling at Multifamily Sites

OBTAINING WASTE SAMPLES AT MULTIFAMILY SITES

The volume of waste in each waste container was measured using a tape measure along each dimension, and the dimensions were recorded on a *multifamily site visit form* created specifically for that multifamily site. (See Appendix C: Forms Used in the Study for an example of a *multifamily site visit form*.) Later, the waste disposal rate for each multifamily site was calculated based on the total volume of accumulated waste that was measured, divided by the time elapsed since the most recent waste pickup.

All the waste disposal bins at the site were inspected to determine whether any substantial and obvious differences existed among waste in the bins. In most cases, the waste sample was obtained from a single bin, chosen at random from among those present at the site. If clear differences were apparent in the waste from bin to bin, then subsamples from two bins were taken to ensure a representative sample. However, the waste in *all* waste containers associated with the building was measured in order to calculate a waste disposal rate for the entire site.

Each waste sample was extracted from the bin by pulling out a vertical cross-section of waste estimated to weigh at least 200 pounds. The sample was loaded into the back of a van, transported to the solid waste site scheduled for that day, and sorted according to the same protocol that was used for samples of waste from other sectors.

Sorting Samples and Recording Data

Figure 29. Tarped Sample Waiting to be Sorted

After a sample was collected and placed on a tarp, the material was sorted by hand into the prescribed component types. The *material types* are defined in Appendix B: List and Definitions of Material Types. Plastic laundry baskets were used to contain the separated components. Three crew members sorted the contents of each sample and placed each material type in the appropriate basket, while the field crew supervisor monitored the consistency and accuracy of each crew member's work. Crew members typically specialize in groups of *material types*, such as papers or plastics. In addition to manually sorting loads, the sorting crew estimated the percentage of leaves and the percentage of grass, by weight, in the *leaves and grass* material category, and counted the number of *sharps* found in the load.

The field crew supervisor monitored the homogeneity of the material that the sorting crew placed into the assigned component baskets, and directed the re-sorting of *material types* if they were

improperly classified. Open laundry baskets allowed the supervisor to see the material at all times.

The supervisor also verified the purity of each component as it was weighed, before recording the weight into the *sample sorting and characterization form*. See Appendix C: Forms Used in the Study for an example of a *sample sorting and characterization form*. The *material types* were sorted to the greatest reasonable level of detail by hand, until no more than a small amount of homogeneous fine material (*mixed residue*) remained.

The baskets holding each material category were weighed (accounting for each basket's empty weight) on a set of scales that was calibrated to accuracy within one-tenth of a pound. The field crew supervisor recorded composition weights and the information obtained from the driver on the *sample sorting and characterization form.*

The data from each season's waste sorts were then entered into a database, which was developed using Microsoft Access® prior to the start of sampling. The database permitted entry of the characteristics of the waste load associated with each sample, as well as the weights of the material components in each sample. Material component weights were entered twice, independently, for each sample, and the entered weights were compared to verify that the first entry matched the second entry.

Divertibility Analysis

The field crew assessed the extent and point of contamination for commonly recoverable materials on a portion of the samples sorted. Approximately one in four of the residential, commercial, residential self-hauled, and commercial self-hauled samples that were collected were randomly selected for the divertibility assessment. Samples from the construction, demolition, and remodeling; roofing; and landscaping activity types were excluded from the divertibility analysis. Samples included in the divertibility analysis were sorted just like other samples except that the 15 targeted materials were subsorted into three categories: (a) clean, (b) contaminated during collection (load-contaminated), and (c) contaminated prior to collection (source-contaminated).

Figure 30. Clean vs. Load Contaminated Paper

The materials included in the divertibility assessments are shown in Table 44. Their definitions can be found in Appendix B: List and Definitions of Material Types.

The contamination categories were defined as follows:

Figure 31. Clean Materials

1. **Clean**. Material did not become soiled or contaminated during hauling and could reasonably be expected to be recycled in recycling programs targeting the material without special processing, cleaning, and/or repair. For example, a clean plastic soda bottle, dry office paper, a glass wine bottle still intact without any residue on the outside, or a clean, dry, and still folded newspaper.

Figure 32. Load Contaminated Materials

2. **Load-Contaminated**. Material appears to have been contaminated after disposal (in individual can or dumpster) or during waste collection. Typically materials are contaminated with moisture or food, such as a newspaper wet from a leaked beverage, a plastic soda bottle covered with food on the outside, or a bottle or can covered in grass clippings.

Figure 33. Source Contaminated Materials

3. **Source-Contaminated**. Material appears to have been contaminated through use or prior to collection. For example, cardboard with a lot of tape, newspaper covered with paint used for masking, newspaper used to wrap fish, paper plates with food residue, or peanut butter jars with residue.

Table 44: Materials Included in the Divertibility Assessments

Material Type	
Uncoated Corrugated Cardboard	Aluminum Cans
Paper Bags	PETE Water Bottles
Newspaper	PETE Sealed Containers
White Ledger	Other PETE Containers
Other Office Paper	HDPE Containers
Other Miscellaneous Paper	#3-#7 Sealed Containers
Remainder/Composite Paper	#3-#7 Other Containers
Tin/Steel Cans	

Asbestos Testing in Roofing Loads

This study tested for the presence of asbestos in roofing waste, targeting five *material types*:

1. *Asphalt composition shingles;*
2. *Roofing tar paper/felt;*
3. *Roofing mastic;*
4. *Built-up roofing; and*
5. *Other asphalt roofing material.*

The asbestos sampling process was carried out in five steps:

1. Selecting loads;
2. Collecting samples;
3. Labeling samples;
4. Maintaining sample chain of custody; and
5. Testing samples for asbestos and analyzing results.

Selecting Loads

All vehicles entering the sampling facility were interviewed by a member of the study team (the "gatekeeper"). Every facility had a quota for roofing loads to be sampled for asbestos (generally two to three loads per facility, per season), as well as a quota for roofing loads to be sorted, or characterized (generally one per day, per season). All roofing loads being sorted were sampled for asbestos testing, though not all loads selected for sampling were sorted. Roofing loads were to be randomly selected for sampling until the daily quota had been achieved. In the first two seasons of sampling, the study team encountered very few roofing loads, potentially due to poor weather and a general slowdown in the construction industry. This meant that virtually every roofing load surveyed was selected for sampling and approximately every other roofing load was sorted, some days in excess of the daily quota to guard against days in which no roofing loads were available.

When the gatekeeper determined that a vehicle contained roofing material, the vehicle was marked with a *sample placard*. The *sample placard* indicated to the sorting crew that a roofing sample was to be collected from the selected vehicle.

Collecting Samples

When a selected vehicle arrived at the tipping area, a member of the field crew collected the sample placard and prepared to collect a roofing sample. If the load was to be sorted, a 200-pound cell of material was selected and set aside for sorting and the roofing sample for asbestos testing was collected from the material remaining in the load. Figure 34 shows a sample of asphalt composition shingles, with the sample placard visible on top of the pile, waiting to be sorted. The same procedure for collecting the sample was used whether or not a portion of material was removed for hand sorting. The asbestos sampling procedure included three steps:

Figure 34. Sample of Shingles to be Hand Sorted

1. Where space and site conditions permitted, the member of the field crew collecting the sample walked around the entire load and noted which roofing materials were present;
2. The collector cut a four-square-inch sample of each roofing material type noted. When there appeared to be more than one roof in the load (either the roofs came from multiple houses or a single house had newer roofing over an older roof) material was collected from each of the identified roofs; and
3. Samples were placed in individual, labeled, re-sealable plastic bags. Each material from each layer was placed in a separate bag to prevent cross-contamination of the samples and each carried a unique sample identification label. All sample baggies from a single load were then placed in a one-gallon plastic bag for storage.

Labeling Samples

Every bagged item was labeled with a unique identifier consisting of four parts. Figure 35 presents an example of a sample ID for a load that was only sampled, not sorted. As detailed in the figure, there are four components of the sample ID:

- The first two parts allow a roofing sample to be cross referenced with the vehicle survey;
- The third part is a short letter code to designate the material type (e.g., CS for composition shingles, TP for tar paper); and
- The final part of the identifier is a number used to identify multiple samples of the same material from an individual load. If two samples of composition shingles are collected from a single load, one composition shingle sample will have a "1" in the fourth part of the identifier, the next will be designated with a "2" and so on for each sample of composition shingles in that load.

Figure 35: Roofing Subsample RF-6-CS-2

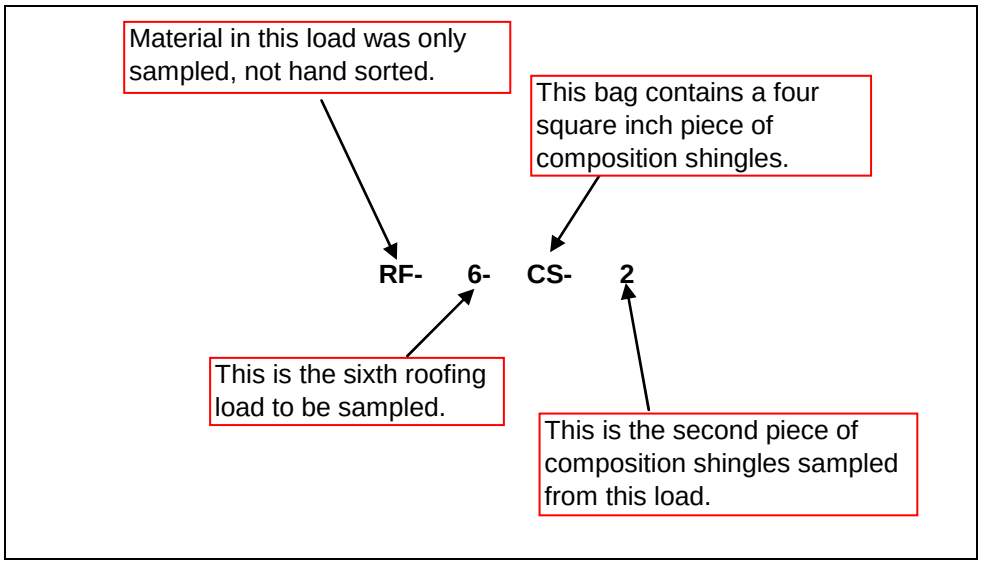
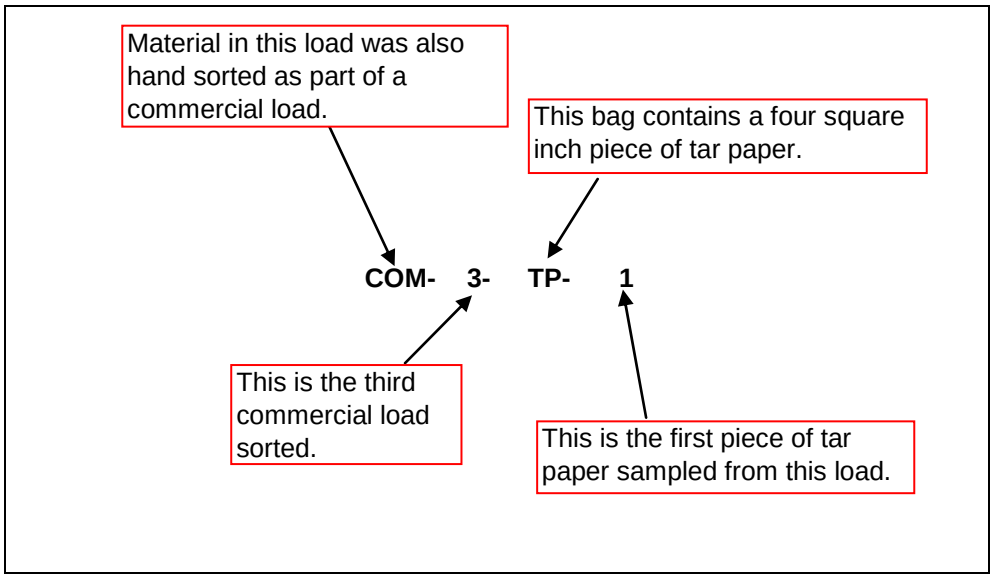


Figure 36 presents a potential sample ID for a load that was also sorted. In this case, the sorting ID is used for the first two parts of the sample ID.

Figure 36: Roofing Subsample COM-3-TP-1



Maintaining Sample Chain of Custody

After all samples from a load were bagged and labeled, the collector recorded the data from the sample label plus the name of the facility and the date on a sample log. An example of the roofing sample log is shown in Figure 37. At the end of the field season this log accompanied the samples to the testing facility. The testing facility acknowledged receipt of the samples and verified the samples listed on the log against the samples received. Any discrepancies were rectified before the analysis began.

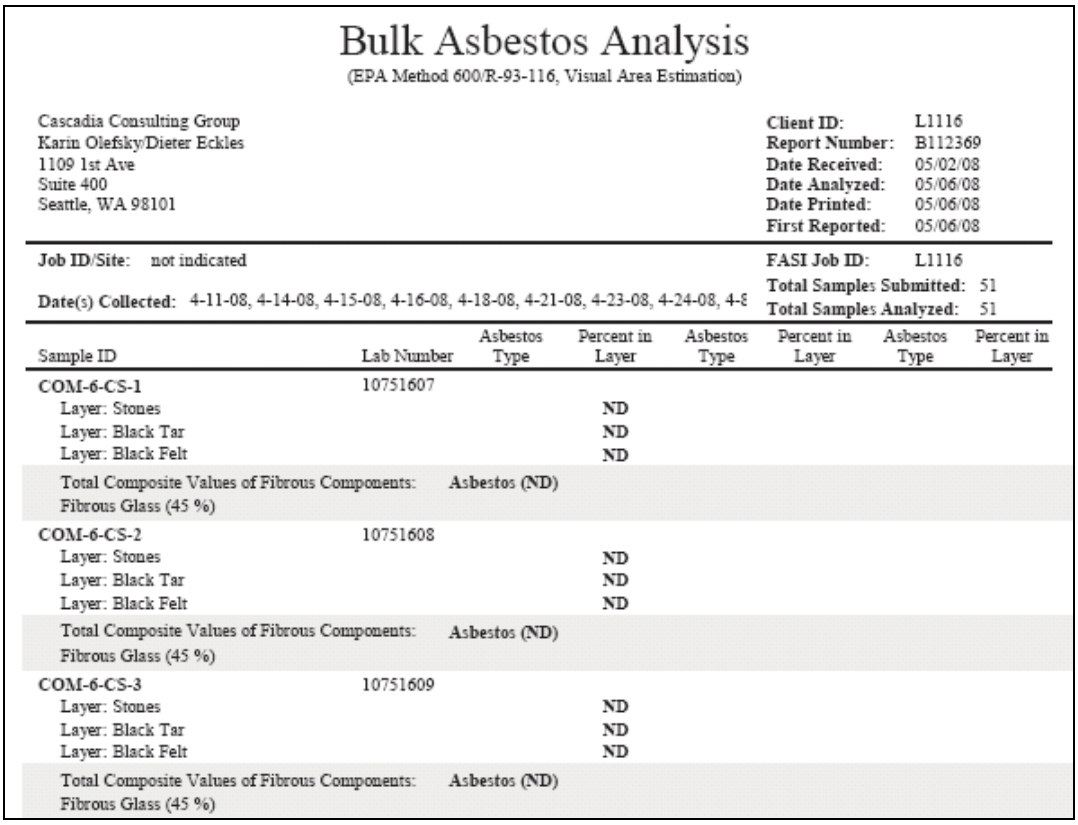
Figure 37: Chain of Custody Form

Sample ID	Date	Facility	Sector	Material Type
				CS = Asphalt Roofing Compsition Shingles Tar = Roofing Tar Paper/Felt RM = Roofing Mastic BR = Built-up Roofing O = Other Asphalt Roofing Material
ex. SH1 -CS	15-Jan	Bass	COM RES (SH)	CS
SH1-Tar	15-Jan	Bass	COM RES (SH)	Tar
COM-6-CS-1	April 8	Sycamore	(COM) RES SH	CS
COM-6-CS-2	4/8	Sycamore	(COM) RES SH	CS
COM-6-CS-3	4/8	Sycamore	(COM) RES SH	CS
RF-2-RM-1	4/9	Taft	COM RES (SH)	RM
RF-2-Tar-1	4/9	Taft	COM RES (SH)	Tar
RF-2-CS-1	4/9	Taft	COM RES (SH)	CS
SH-3-TP-1	4/8/08	Sycamore	COM RES (SH)	TP
SH-3-CS-1	4/8/08	Sycamore	COM RES (SH)	CS
RF-3-CS-1	4/9	Taft	COM RES (SH)	CS
RF-3-TP-1	4/9	Taft	COM RES (SH)	TP
RF-3-TP-2	4/9	Taft	COM RES (SH)	TP
RF-3-RM-1	4/9	Taft	COM RES (SH)	RM
RF-4-CS-1	4/9	Taft	COM RES (SH)	CS
RF-4-CS-2	4/9	Taft	COM RES (SH)	CS
RF-4-TP-1	4/9	Taft	COM RES (SH)	TP
RF-5-TP-1	4/11	Shafter	COM RES (SH)	TP
RF-5-CS-1	4/11	Shafter	COM RES (SH)	CS
RF-6-TP-1	4/11	Shafter	(COM) RES SH	TP
RF-7-CS-1	4/11	Shafter	COM RES (SH)	CS
RF-7-CS-2	4/11	Shafter	COM RES (SH)	CS
RF-7-TP-1	4/11	Shafter	COM RES (SH)	TP
RF-8-TP-1	4/11	Shafter	(COM) RES SH	TP
RF-8-CS-1	4/11	Shafter	(COM) RES SH	CS
~~RF-9-TP-1~~	~~4/14~~	~~Solon~~	~~COM RES (SH)~~	~~TP~~
~~RF-9-CS-1~~	~~4/14~~	~~Solon~~	~~COM RES (SH)~~	~~CS~~
SH-1-TP-1	4/14	Solon	COM RES (SH)	TP
SH-1-CS-1	4/14	Solon	COM RES (SH)	CS
RF-9-O-1	4/14	Solon	(COM) RES SH	O
RF-9-TP-1	4/14	Solon	(COM) RES SH	TP
RF-10-TP-1	4/15	Solon	COM RES (SH)	TP
RF10-CS-1	4/15	Solon	COM RES (SH)	CS
RF-10-CS-2	4/15	Solon	COM RES (SH)	CS
SHR-5-TP-1	4/15	Solon	COM RES (SH)	TP
SHR-5-CS-1	4/15	Solon	COM RES (SH)	CS
SH-3-TP-1	4/16	Guadalupe	COM RES (SH)	TP
			COM RES (SH)	CS

Testing Samples for Asbestos and Analyzing Results

The asbestos testing was performed by an independent asbestos testing lab using EPA Method 600/R-93-116. The lab analyzed the material in each bag separately; when that material was composed of multiple layers (as with composition shingles which contain tar paper, felt, and stone layers), each layer was analyzed separately. Results were provided electronically and indicate the presence or absence of asbestos as well as the composition of the various fiber types found for each sample. An example lab results page is included as Figure 38.

Figure 38: Asbestos Testing Results



Bulk Asbestos Analysis

(EPA Method 600/R-93-116, Visual Area Estimation)

Cascadia Consulting Group
Karin Olefsky/Dieter Eckles
1109 1st Ave
Suite 400
Seattle, WA 98101

Client ID: L1116
Report Number: B112369
Date Received: 05/02/08
Date Analyzed: 05/06/08
Date Printed: 05/06/08
First Reported: 05/06/08

Job ID/Site: not indicated

Date(s) Collected: 4-11-08, 4-14-08, 4-15-08, 4-16-08, 4-18-08, 4-21-08, 4-23-08, 4-24-08, 4-8

FASI Job ID: L1116
Total Samples Submitted: 51
Total Samples Analyzed: 51

Sample ID	Lab Number	Asbestos Type	Percent in Layer	Asbestos Type	Percent in Layer	Asbestos Type	Percent in Layer
COM-6-CS-1	10751607						
Layer: Stones			**ND**				
Layer: Black Tar			**ND**				
Layer: Black Felt			**ND**				
Total Composite Values of Fibrous Components:		**Asbestos (ND)**					
Fibrous Glass (45 %)							
COM-6-CS-2	10751608						
Layer: Stones			**ND**				
Layer: Black Tar			**ND**				
Layer: Black Felt			**ND**				
Total Composite Values of Fibrous Components:		**Asbestos (ND)**					
Fibrous Glass (45 %)							
COM-6-CS-3	10751609						
Layer: Stones			**ND**				
Layer: Black Tar			**ND**				
Layer: Black Felt			**ND**				
Total Composite Values of Fibrous Components:		**Asbestos (ND)**					
Fibrous Glass (45 %)							

Vehicle Surveys

In order to quantify the waste associated with each sector and subsector, surveys were conducted at the entrance of all 27 participating sampling facilities as well as at an additional 15 survey-only facilities, shown below in Table 45. These 15 sites were not randomly selected, but chosen from the largest sites in each region. This was done to ensure that some large sites were included in the vehicle survey analysis, since random sampling may not always select large sites.

Table 45: Additional 15 Survey-Only Facilities

Region	County	Facility	City	Seasons	2008 Dates
Bay Area	Alameda	Davis Street Transfer	San Leandro	Winter	2/1
	San Francisco	San Francisco Transfer	San Francisco	Spring	4/25
	Sonoma	Central Transfer	Petaluma	Autumn	12/3
Coastal	Monterey	Crazy Horse Sanitary Landfill	Salinas	Winter	1/22
	Santa Cruz	Buena Vista Landfill	Watsonville	Summer	7/15
	San Luis Obispo	Cold Canyon Sanitary Landfill	San Luis Obispo	Autumn	12/1
Mountain	Amador	Western Amador Transfer (WARF)	Ione	Spring	4/18
	Inyo	Bishop Sunland Sanitary Landfill	Bishop	Summer	7/25
	Siskiyou	Yreka Transfer	Yreka	Autumn	12/4
Southern	Los Angeles	Carson Transfer	Carson	Spring	4/7
	Los Angeles	Puente Hills Sanitary Landfill	Industry	Summer	7/11
	Orange	Olinda Alpha Sanitary Landfill	Brea	Summer	7/12
Valley	Fresno	Jefferson Avenue Transfer	Fresno	Winter	1/31
	Kern	Bena Sanitary Landfill	Caliente	Summer	7/14
	Madera	Fairmead Sanitary Landfill	Chowchilla	Autumn	12/2

The surveys were administered to the drivers of each vehicle entering the facility through the gate at which the surveyor was posted. If the facility had multiple gates, then the surveyor rotated among the gates at regular intervals of approximately one hour. Additional information on weekend disposal patterns was gathered from the facility to supplement survey data for weekdays and adjust data to better reflect overall disposal at the facility.

The ultimate product of the survey data and weekend data was an estimate of the fraction of the overall waste stream contributed by each of the waste sectors, subsectors, and activities at each participating facility. The Quantifying Disposed Waste section of Appendix A: Detailed Methodology describes how this information was then used to estimate the relative magnitude of each part of the disposed waste stream on a regional basis and statewide.

On survey days, the surveyor arrived at the site at the scheduled start time, which was scheduled to permit full coverage throughout the day and at times of greatest traffic at the facility. The surveyor introduced himself or herself to the scalehouse staff and verified the procedure for administering the survey that day by confirming several key details:

- The procedure for obtaining vehicle net weights;
- Any rules the facility used for assigning a minimum net weight to certain types of vehicles, such as those carrying residential self-hauled loads; and
- Any rules governing the assignment of *net volume* estimates instead of net weights.

The surveyor positioned himself or herself at the designated entrance to the facility and interviewed the driver of each passing vehicle. The information gathered through the interview included the following:

- The jurisdiction from which the trash originated;
- The waste sector (residential, commercial, or self-hauled) and subsector (single-family residential, multifamily residential, residential self-hauled, or commercial self-hauled);
- Whether the load consisted of residuals from a materials recovery facility, and if so, the name of the facility;
- In cases where loads were comprised of waste from multiple sectors, the estimated proportions of the sectors represented in the load;
- The activity that generated the waste; and
- Vehicle type.

An example *vehicle survey form* that was used to collect the data is included in Appendix C: Forms Used in the Study.

At most of the facilities, it was possible for the surveyor to obtain net weights for vehicles by observing the weighing process at the scalehouse and recording the weight at the same moment the vehicle drove across the scales. In some cases, the surveyor coordinated with scalehouse personnel periodically throughout the day to obtain weight tickets (transaction receipts) corresponding to every load of waste brought to the facility.

In all cases, the surveyor recorded the type of waste and net weight, net volume, or default assigned weight for every vehicle encountered that was carrying disposed waste that did not come from another solid waste facility. The survey did not record loads of non-disposed waste, material to be recycled or recovered, alternative daily cover, or material brought from transfer stations or other solid waste or recovery facilities.

Data taken on the survey forms was checked for accuracy in the field. The surveyor checked the forms to ensure that all appropriate information had been gathered. The survey supervisor checked the surveys after they were returned to the office to confirm that all the required data was properly entered. Survey entries with errors or that were incomplete were not used.

At the end of each data collection season, the data on the survey forms was entered into a Microsoft Access® database. Following data entry, the entries were compared in two separate checks with the written field records. First, the field survey data were entered twice into a customized database that compared the two sets of entries and flagged any that did not match. Second, each database record was reviewed and compared against the original field form. Any data entry errors were addressed. In cases where data entry errors or omissions could not be resolved, the entry was deleted.

Description of Calculations and Statistical Procedures Used

Data from vehicle surveys, facility tonnage reports, and the sorting of waste samples were analyzed to yield estimates of percentages and tonnages of *material types* in California's waste stream. This section describes the methodology used to obtain each estimate and its associated confidence interval (error range).

The general calculation strategy involved two common themes: (1) the use of ratio estimators to determine the composition percentages of the waste stream; and (2) aggregation of sample data from the regional level to the statewide level. A ratio estimator involves the ratio of two quantities, both of which are random variables. For most of the steps in the analysis, the basic ratio estimator was derived as the ratio of the weight of material in a given sample over the total weight of the sample. The general procedure involved creating a new ratio estimator by weighting across ratios from a lower level. For example, statewide ratio estimators were created by weighting of the region-level ratio estimators.

Quantifying Disposed Waste

Disposed waste from each sector was quantified through the use of vehicle surveys and tonnage reports at the facilities participating in the study. The calculation method is described below.

Step 1: Aggregating Survey Records to Produce Findings at the Facility Level. For a given facility on a given day, each vehicle that was included in the gatehouse survey had its net weight of waste assigned to one or more of the established waste sectors, according to the response of the driver. Thus, the tonnage from each vehicle was assigned or apportioned to one or more of the commercial, single-family residential, multifamily residential, commercial self-hauled, or residential self-hauled sectors. Where possible, self-hauled tonnages were also assigned to activity categories: construction and demolition, roofing, landscaping, or other/unknown. The tonnages identified through the survey were used to calculate the relative proportions of the waste stream associated with each sector, subsector, and activity.

Transaction records from facilities supplemented survey data with additional information on the quantities of commercially-collected compared to self-hauled tonnages. Most survey days were scheduled for weekdays, so transaction records for both weekdays and weekend days were requested from all facilities. The study team determined the tonnages on those additional days brought by franchised haulers and by self-hauled vehicles. These estimates were used to improve the overall breakdown between franchised and self-hauled vehicles over the whole week, including weekends. Within the broad categories of franchised and self-hauled loads, survey data were applied to designate tonnage from transaction records to the sectors, subsectors, and activity types. For example, the transaction record tonnage for franchised haulers was assigned to the residential and commercial sectors in the same proportion as had been found on survey days. Because for several sites only weekday survey data were available, weekend tonnage from transaction records within a category (franchised or self-hauled) were designated to a sector or subsector (i.e. commercial, single-family, and multifamily) using the weekday proportions. The weekend information improves the overall proportion estimates by providing a more accurate picture of the breakdown between franchised and self-haulers on weekends. While most tonnage is brought by franchised haulers on weekdays, tonnage from self-hauled vehicles is typically higher on weekend days. The method is described below:

1. Using survey data from all days (weekday and weekend), the relative proportion of waste brought by franchised haulers assigned to each relevant sector and subsector and the relative proportion of waste brought by self-hauled vehicles assigned to each relevant subsector (commercial self-hauled, residential self-hauled) were estimated.
2. These proportions were applied to the franchised and self-hauled tonnages from transaction records for weekdays and weekend days separately to derive additional “days” of data with an actual category tonnage (from transaction records) and estimated sector and subsector tonnages.

3. The tonnages from survey days and additional days were summed for each facility, by weekday and weekend day, and then divided by the total number of "days" of data to derive an average weekday and average weekend day for each facility.

The projection of waste tonnage for an average weekday, based on the vehicle survey and supplementary information, was scaled up by the number of weekdays per week a given facility is open (typically five) to produce an estimate of tonnages for each type of waste for all weekdays during a given week.

Similarly, the projection of waste tonnage for an average weekend day, based on the vehicle survey and supplementary information, was scaled up by the number of weekend days a given facility is open to produce an estimate of tonnages for each type of waste for all weekend days a waste facility was open during a given week.

The weekday and weekend day tonnages were summed to produce a composite set of estimates of the amount of waste from each sector, subsector, and activity arriving at the solid waste facility over a representative week. These tonnages were converted to relative proportions (percentages).

Each facility's reported tonnage figures for disposed waste were obtained for the calendar year 2007. The relative proportions described above were applied to these reported figures to produce estimates of the tons of disposed waste associated with each sector, subsector, and activity at the facility in question.

Example of Estimating Sector Proportions at the Facility Level

For example, imagine that Facility A was visited on two weekdays. Suppose that Facility A also provided transaction records for one weekday and one weekend day. The following scenario describes how the percentages of waste for each sector and subsector were calculated for this facility.

First, survey data from the facility for the two weekdays the study crew was present were examined to determine the tons associated with the studied sectors and subsectors. A hypothetical accounting of tonnages from two daily transaction reports is shown below. Example numbers are rounded and decimals are not carried through calculations.

	Franchised			**Self-hauled**		**Total**
Facility A	Commercial	Single-family Residential	Multifamily Residential	Commercial Self-hauled	Residential Self-hauled	
Tonnage from survey weekday 1	20	20	20	15	15	**90**
Tonnage from survey weekday 2	30	15	25	20	10	**100**
Tonnage for two weekdays	**50**	**35**	**45**	**35**	**25**	**190**

Next, the tonnages were converted into percentages within the franchised and self-hauled categories, as shown below.

	Franchised				Self-hauled		
Facility A	Commercial	Single-family Residential	Multifamily Residential	**Total Franchised**	Commercial Self-hauled	Residential Self-hauled	**Total Self-hauled**
Tonnage for two weekdays	50	35	45	**130**	35	25	**60**
Percentages	38%	27%	35%	**100%**	58%	42%	**100%**

These percentages were then applied to the franchised and self-hauled tonnages from transaction records supplied by the facility.

	Franchised			Self-hauled	
Facility A	Commercial	Single-family Residential	Multifamily Residential	Commercial Self-hauled	Residential Self-hauled
Tonnage from weekday records	75			20	
	29	**20**	**26**	**12**	**8**
Tonnage from weekend day records	30			100	
	11	**8**	**11**	**58**	**42**

The calculated daily tonnages were averaged to create typical weekdays and weekend days. An average week was then constructed by the days each facility is open. For this example, suppose that Facility A operates from Monday through Saturday, or five weekdays and one weekend day.

	Franchised			Self-hauled	
Facility A	Commercial	Single-family Residential	Multifamily Residential	Commercial Self-hauled	Residential Self-hauled
Average weekday tonnage	(50+29)/3=	(35+20)/3=	(45+26)/3=	(35+12)/3=	(25+8)/3=
	26	**18**	**24**	**16**	**11**
Average weekend day tonnage	(11)/1=	(8)/1=	(11)/1=	(58)/1=	(42)/1=
	11	**8**	**11**	**58**	**42**
Average weekly tonnage	(26*5)+11	(18*5)+8	(24*5)+11	(16*5)+58	(11*5)+42
	141	**98**	**131**	**138**	**97**

The average weekly tonnage for each facility was converted to percentages for each sector, subsector, and activity and then multiplied by the total tons of waste disposed by that facility in 2007, according to the Board's Disposal Reporting System. Suppose that Facility A accepted 500,000 tons of waste in 2007. The amounts that would be assigned to each sector and subsector are shown in the table below.

	Franchised			Self-hauled	
Facility A	Commercial	Single-family Residential	Multifamily Residential	Commercial Self-hauled	Residential Self-hauled
Average weekly tonnage	141	98	131	138	97
Percentage of Facility tonnage	23%	16%	22%	23%	16%
Annual tonnage	**115,000**	**80,000**	**110,000**	**115,000**	**80,000**

Step 2: Aggregating Tonnage from Facilities to Produce Findings at the Regional Level. Tonnage estimates for each type of waste were combined for participating facilities within each region, using a weighted averaging method. The tonnage estimates for each type of waste at all participating facilities within a region were aggregated, and relative proportions were calculated for each sector, subsector, and activity. The aggregated proportions for each sector, subsector, and activity were then applied to the total 2007 disposal figure for the region, as drawn from the Disposal Reporting System.

For example, hypothetical annual tonnages by subsector for two facilities visited in a region are shown in the table below.

	Commercial	Single-family Residential	Multifamily Residential	Commercial Self-hauled	Residential Self-hauled	Total
Facility A	115,000	80,000	110,000	115,00	80,000	500,000
Facility B	150,000	80,000	10,000	30,000	5,000	275,000
Total (tons)	265,000	160,000	120,000	145,000	85,000	775,000
% of Total	34%	21%	15%	19%	11%	100%

Self-hauled commercial waste was further subdivided into construction and demolition, landscaping, roofing, and other activities, using survey data as in the table below.

	Construction & Demolition	Roofing	Landscaping	Other Commercial	Total Commercial Self-hauled
Facility A (tons)	34,000	35,000	6,500	39,500	115,000
Facility B (tons)	12,000	10,500	3,000	4,500	30,000
Totals of both facilities	46,000	45,500	9,500	44,000	145,000
% of total	32%	31%	7%	30%	100%

Using an annual tonnage for this region of 2 million tons, we can assign tonnages to sectors, subsectors, and activities according to the percentages from the survey data.

Region 1	Commercial	Single-family Residential	Multifamily Residential	Commercial Self-hauled	Residential Self-hauled	Total
Percents	34%	21%	15%	19%	11%	100%
Tons	680,000	420,000	300,000	380,000	220,000	2,000,000

	Construction & Demolition	Roofing	Landscaping	Other Commercial
Percents	32%	31%	7%	30%
Tons	121,600	117,800	26,600	114,000

Step 3: Aggregating Regional Findings to Produce Sector Tonnage Estimates Statewide. The relative proportions of disposed waste corresponding to each sector were combined among regions using a weighted aggregation method. The weightings associated with each region were proportional to the total disposed tonnage for the region for calendar year 2007. This step resulted in a final set of proportions reflecting the relative disposal of waste corresponding to each waste sector statewide. The proportions were then multiplied by the total 2007 statewide disposal figure to produce the statewide tonnage estimate associated with each sector.

The 2007 figures for disposed tonnage associated with each region, as drawn from the Disposal Reporting System, are shown in Table 46.

Table 46: Total Waste Disposal (Tons) in Each County and Region, 2007

Bay Area		Coastal		Mountain		Southern		Central Valley	
Alameda	2,071,934	Del Norte	0	Alpine	0	Imperial	259,585	Butte	174,815
Contra Costa	814,846	Humboldt	0	Amador	0	Los Angeles	9,766,692	Colusa	557
Marin	352,659	Lake	51,940	Calaveras	47,384	Orange	4,507,852	Fresno	870,815
Napa	39,546	Mendocino	0	El Dorado	1,328	Riverside	3,450,571	Glenn	20,356
San Francisco	0	Monterey	524,644	Inyo	18,435	San Bernardino	1,723,496	Kern	865,688
San Mateo	695,684	San Benito	90,133	Lassen	21,398	San Diego	3,693,881	Kings	643,048
Santa Clara	1,115,949	San Luis Obispo	278,089	Mariposa	13,855	Ventura	1,152,330	Madera	130,141
Solano	1,175,378	Santa Barbara	376,712	Modoc	0			Merced	248,460
Sonoma	0	Santa Cruz	179,456	Mono	33,901			Placer	252,393
				Nevada	0			Sacramento	905,970
				Plumas	0			San Joaquin	1,647,923
				Sierra	3,925			Shasta	301,107
				Siskiyou	8,752			Stanislaus	439,609
				Trinity	0			Sutter	0
				Tuolumne	0			Tehama	48,581
								Tulare	249,897
								Yolo	186,929
								Yuba	266,175
Totals:	**6,265,996**		**1,500,973**		**148,979**		**24,554,405**		**7,252,464**
	15.8%		**3.8%**		**0.4%**		**61.8%**		**18.3%**
						Total Statewide: 39,722,818 tons			

Source: Board's Disposal Reporting System. Counties showing 0 tons disposed do not have local solid waste facilities and send waste to other counties.

Estimating Waste Composition

Waste composition estimates were calculated using a method that gave equal weighting or "importance" to each sample within a given stratum. Confidence intervals (error ranges) were calculated based on assumptions of normality in the composition estimates. The divertibility analysis composition data was calculated using the same method only with a reduced material list to reflect the reduced number of materials actually subsorted as part of the divertibility analysis. For the commercial sector and overall composition estimates the commercial sector was subdivided into large and small vehicle subsectors. Packer trucks were considered large vehicles and roll-off boxes were considered small vehicles. Typically roll-off boxes are lighter than packer trucks but they dump in approximately equal numbers. The commercial sector was divided to correct for this disparity between the number of roll-off boxes and their tonnage contribution to the waste stream.

In the descriptions of calculation methods, the following variables are used frequently:

- *i* denotes an individual sample;
- *j* denotes the material type;
- c_j is the weight of the material type *j* in a sample;
- *w* is the weight of an entire sample;
- r_j is the composition estimate for material *j* (*r* stands for *ratio*);
- *a* denotes a region of the state (*a* stands for *area*);
- *s* denotes a particular sector or subsector of the waste stream; and
- *n* denotes the number of samples in the particular group that is being analyzed at that step.

ESTIMATING THE COMPOSITION

The following method was used to estimate the composition of waste belonging to the single-family residential, multifamily residential, commercial, commercial self-hauled, and residential self-hauled sectors.

For a given stratum (that is, for the samples belonging to the same waste sector within the same region), the composition estimate denoted by r_j represents the ratio of the component's weight to the total weight of all the samples in the stratum. This estimate was derived by summing each component's weight across all of the selected samples belonging to a given stratum and dividing by the sum of the total weight of waste for all of the samples in that stratum, as shown in the following equation:

$$r_j = \frac{\sum_i c_{ij}}{\sum_i w_i} \qquad (1)$$

where:

- c = weight of particular component;
- w = sum of all component weights;
- for i = 1 to n, where n = number of selected samples; and
- for j = 1 to m, where m = number of components.

For example, the following simplified scenario involves three samples. For the purposes of this example, only the weights of the component *carpet* are shown.

	Sample 1	**Sample 2**	**Sample 3**
Weight (c) of carpet	5	3	4
Total Sample Weight (w)	80	70	90

$$r_{Carpet} = \sum \frac{5+3+4}{80+70+90} = 0.05$$

To find the composition estimate for the component *carpet*, the weights for that material are added for all selected samples and divided by the total sample weights of those samples. The resulting composition is 0.05, or 5 percent. In other words, 5 percent of the sampled material, by weight, is *carpet*. This finding is then projected onto the stratum being examined in this step of the analysis.

The confidence interval for this estimate was derived in two steps. First, the variance around the estimate was calculated, accounting for the fact that the ratio included two random variables (the component and total sample weights). The variance of the ratio estimator equation follows:

$$\mathrm{Var}(r_j) \approx \left(\frac{1}{n}\right)\left(\frac{1}{\overline{w}^2}\right)\left(\frac{\sum_i \left(c_{ij} - r_j w_i\right)^2}{n-1}\right) \qquad (2)$$

where:

$$\overline{w} = \frac{\sum_i w_i}{n} \qquad (3)$$

(For more information regarding Equation 2, refer to *Sampling Techniques, 3rd Edition* by William G. Cochran [John Wiley & Sons, Inc., 1977].)

Second, precision levels at the 90 percent confidence level were calculated for a component's mean as follows:

$$r_j \pm \left(z\sqrt{\mathrm{Var}(r_j)}\right) \quad (4)$$

where z = the value of the z-statistic (1.645) corresponding to a 90 percent confidence level.

Composition results for strata were then combined, using a weighted averaging method, to estimate the composition of larger portions of the waste stream. The relative tonnages associated with each stratum served as the weighting factors. The calculation was performed as follows:

$$O_j = \left(p_1 * r_{j1}\right) + (p_2 * r_{j2}) + (p_3 * r_{j3}) + \ldots \quad (5)$$

where:

- p = the proportion of tonnage contributed by the noted waste stratum (the weighting factor);
- r = ratio of component weight to total waste weight in the noted waste stratum (the composition percent for the given material component); and
- for j = 1 to m, where m = number of material components.

For example, the above equation is illustrated here using three waste strata.

	Stratum 1	Stratum 2	Stratum 3
Ratio (r) of carpet	5%	10%	10%
Tonnage	25,000	100,000	50,000
Proportion of tonnage (p)	14.3%	57.1%	28.6%

To estimate the portion of larger portions of the waste stream, the composition results for the three strata are combined as follows.

$$O_{Carpet} = (0.143 * 0.05) + (0.571 * 0.10) + (0.286 * 0.10) = 0.093 = 9.3\%$$

The variance of the weighted average was calculated as follows:

$$\mathrm{Var}(O_j) = \left(p_1^2\ \mathrm{Var}(r_{j1})\right) + \left(p_2^2\ \mathrm{Var}(r_{j2})\right) + \left(p_3^2\ \mathrm{Var}(r_{j3})\right) + \ldots \quad (6)$$

ESTIMATING COMPOSITION OF ENTIRE STATEWIDE DISPOSED WASTE STREAM

Composition results for all waste sectors were combined, using a weighted averaging method, to estimate the composition of the entire statewide disposed waste stream. The relative tonnages associated with each sector served as the weighting factors. The calculation was performed as follows:

$$O_j = \left(p_1 * r_{j1}\right) + (p_2 * r_{j2}) + (p_3 * r_{j3}) + \ldots \quad (7)$$

where:

- p = the proportion of tonnage contributed by the noted waste sector (the weighting factor);
- r = ratio of component weight to total waste weight in the noted waste sector (the composition percent for the given material component); and
- for j = 1 to m, where m = number of material components.

The following scenario illustrates the above equation. This example involves the component *carpet* in three waste sectors.

	Waste Sector 1	Waste Sector 2	Waste Sector 3
Ratio of carpet (r)	0.05	0.10	0.15
Proportion of Tonnage (p)	0.50	0.25	0.25

$$O_{Carpet} = (0.50 * 0.05) + (0.25 * 0.10) + (0.25 * 0.15) = 0.0875$$

So, it is estimated that 0.0875 or 8.75% of the entire waste stream is composed of *carpet*.

The variance of the weighted average was calculated as follows:

$$\mathrm{Var}(O_j) = \left(p_1^2\ \mathrm{Var}(r_{j1})\right) + \left(p_2^2\ \mathrm{Var}(r_{j2})\right) + \left(p_3^2\ \mathrm{Var}(r_{j3})\right) + \ldots \quad (8)$$

Disposal Rates Applied to Population Estimates

Population and housing unit data from 2007 was used and was collected from the California Department of Finance Financial & Economic Data estimates as of January 2009.

Disposal Rate per Capita

Residential disposal was the combined tonnage of both single-family and multifamily subsectors. The residential disposal rate was calculated by dividing the residential sector disposal estimate by the statewide population.

The statewide overall disposal rate estimate was calculated by dividing the total disposed tonnage in the state by the total population.

Disposal Rate per Multifamily Unit

Complexes with five or more units were considered multifamily for the purposes of this study. A percent of vacancies was subtracted from the total number to obtain an occupancy rate. Also included in the number of multifamily units is the number of mobile home units. Disposal rate per multifamily unit was calculated by dividing the statewide disposed tonnage estimate for the multifamily subsector by the number of occupied multifamily units.

Appendix B: List and Definitions of Material Types

Introduction

The list and definitions of the Standard Material Types were drawn from the California Integrated Waste Management Board's Uniform Waste Disposal Characterization Method. Currently, the Standard list consists of 62 *material types*, down from a list of 67 in 2004. Detailed composition tables in the main body of the report are presented using this standard list. However, samples were sorted and characterized based on an expanded list of 85 *material types* in 2008, down from an expanded list of 98 in 2004. Both the standard list and the expanded list have changed over time as some materials become less prevalent in the waste stream and others become of more interest, but enough consistency has been maintained to allow comparison of data over time. The expanded list of *material types* is designed to be "folded up" into the standard list of 62 used for presenting results in this study and provides additional detail on materials of interest to the Board. Appendix D: Expanded Statewide Waste Characterization Tables presents detailed composition tables using the expanded material list.

Table 47 compares the 2008 Standard Material List and the 2004 Standard Material List. Table 48 shows how the 85 materials, those which are used to sort and characterize the waste stream, are "folded up" into the standard list used in the main report.

Changes in the standard list between 2004 and 2008 include:

- Combining the 2004 *colored ledger*, *computer paper*, and *other office paper* into the 2008 *other office paper;*
- Renaming the 2004 *televisions and other items with CRT's* to *video display devices* in 2008 and changing the definition;
- Combining the 2004 *agricultural crop residues* and *remainder/composite organics* into the 2008 *remainder/composite organics*; and
- Combining the 2004 *sewage solids*, *industrial sludge*, and *remainder/composite special waste* into the 2008 *remainder/composite special waste.*

Following the materials table, this appendix also contains the section Definitions of Material Types (Expanded List).

Expanded and Standard List of Material Types

Table 47: Comparison Between the 2008 Standard List and 2004 Standard List

Category	2008 Standard Material List	2004 Standard Material List
Paper	Uncoated Corrugated Cardboard	Uncoated Corrugated Cardboard
	Paper Bags	Paper Bags
	Newspaper	Newspaper
	White Ledger Paper	White Ledger
	Other Office Paper	Colored Ledger
		Computer Paper
		Other Office Paper
	Magazines and Catalogs	Magazines and Catalogs
	Phone Books and Directories	Phone Books and Directories
	Other Miscellaneous Paper	Other Miscellaneous Paper
	Remainder/Composite Paper	Remainder/Composite Paper
Glass	Clear Glass Bottles and Containers	Clear Glass Bottles and Containers
	Green Glass Bottles and Containers	Green Glass Bottles and Containers
	Brown Glass Bottles and Containers	Brown Glass Bottles and Containers
	Other Colored Glass Bottles and Containers	Other Colored Glass Bottles and Containers
	Flat Glass	Flat Glass
	Remainder/Composite Glass	Remainder/Composite Glass
Metal	Tin/Steel Cans	Tin/Steel Cans
	Major Appliances	Major Appliances
	Used Oil Filters	Used Oil Filters
	Other Ferrous	Other Ferrous
	Aluminum Cans	Aluminum Cans
	Other Non-Ferrous	Other Non-Ferrous
	Remainder/Composite Metal	Remainder/Composite Metal
Electronics	Brown Goods	Brown Goods
	Computer-related Electronics	Computer-related Electronics
	Other Small Consumer Electronics	Other Small Consumer Electronics
	Video Display Devices	Television and Other Items with CRTs
Plastic	PETE Containers	PETE Containers
	HDPE Containers	HDPE Containers
	Miscellaneous Plastic Containers	Miscellaneous Plastic Containers
	Plastic Trash Bags	Plastic Trash Bags
	Plastic Grocery and Other Merchandise Bags	Plastic Grocery and Other Merchandise Bags
	Non-Bag Commercial and Industrial Packaging Film	Non-Bag Commercial and Industrial Packaging Film
	Film Products	Film Products
	Other Film	Other Film
	Durable Plastic Items	Durable Plastic Items
	Remainder/Composite Plastic	Remainder/Composite Plastic

Table 47 (cont.)

Category	2008 Standard Material List	2004 Standard Material List
Other Organic	Food	Food
	Leaves and Grass	Leaves and Grass
	Prunings and Trimmings	Prunings and Trimmings
	Branches and Stumps	Branches and Stumps
	Manures	Manures
	Textiles	Textiles
	Carpet	Carpet
	Remainder/Composite Organic	Agricultural Crop Residues
		Remainder/Composite Organics
Inerts and Other	Concrete	Concrete
	Asphalt Paving	Asphalt Paving
	Asphalt Roofing	Asphalt Roofing
	Lumber	Lumber
	Gypsum Board	Gypsum Board
	Rock, Soil and Fines	Rock, Soil, and Fines
	Remainder/Composite Inerts and Other	Remainder/Composite Construction and Demolition
Household Hazardous	Paint	Paint
	Vehicle & Equipment Fluids	Vehicle and Equipment Fluids
	Used Oil	Used Oil
	Batteries	Batteries
	Remainder/Composite Household Hazardous	Remainder/Composite Household Hazardous
Special Waste	Ash	Ash
	Treated Medical Waste	Treated Medical Waste
	Bulky Items	Bulky Items
	Tires	Tires
	Remainder/Composite Special Waste	Sewage Solids
		Industrial Sludge
		Remainder/Composite Special Waste
Mixed Residue	Mixed Residue	Mixed Residue

Table 48: Comparison between the 2008 Standard List and 2008 Expanded List

Category	2008 Standard Material List	2008 Expanded Material List
Paper	Uncoated Corrugated Cardboard	Uncoated Corrugated Cardboard
	Paper Bags	Paper Bags
	Newspaper	Newspaper
	White Ledger Paper	White Ledger Paper
	Other Office Paper	Other Office Paper
	Magazines and Catalogs	Magazines and Catalogs
	Phone Books and Directories	Phone Books and Directories
	Other Miscellaneous Paper	Other Miscellaneous Paper - Non-food Packaging
		All Other Miscellaneous Paper
	Remainder/Composite Paper	Remainder/Composite Paper - Non-food Packaging
		All Other Remainder/Composite Paper
Glass	Clear Glass Bottles and Containers	Clear Glass Bottles and Containers
	Green Glass Bottles and Containers	Green Glass Bottles and Containers
	Brown Glass Bottles and Containers	Brown Glass Bottles and Containers
	Other Colored Glass Bottles and Containers	Other Colored Glass Bottles and Containers
	Flat Glass	Flat Glass
	Remainder/Composite Glass	Remainder/Composite Glass
Metal	Tin/Steel Cans	Tin/Steel Cans
	Major Appliances	Major Appliances
	Used Oil Filters	Used Oil Filters
	Other Ferrous	Other Ferrous
	Aluminum Cans	Aluminum Cans
	Other Non-Ferrous	Other Non-Ferrous
	Remainder/Composite Metal	Remainder/Composite Metal
Electronics	Brown Goods	Brown Goods
	Computer-related Electronics	Computer-related Electronics - Large
		Computer-related Electronics - Small
	Other Small Consumer Electronics	Other Small Consumer Electronics
	Video Display Devices	Video Display Devices

Table 48 (cont.)

Category	2008 Standard Material List	2008 Expanded Material List
Plastic	PETE Containers	PETE Water Bottles
		PETE Sealed Containers
		Other PETE Containers
	HDPE Containers	HDPE Containers
	Miscellaneous Plastic Containers	PLA Water Bottles
		#3-#7 Sealed Containers
		#3-#7 Other Containers
	Plastic Trash Bags	Plastic Trash Bags
	Plastic Grocery and Other Merchandise Bags	Plastic Grocery and Other Merchandise Bags
	Non-Bag Commercial and Industrial Packaging Film	Non-Bag Commercial and Industrial Packaging Film
	Film Products	Film Products
	Other Film	Food Contact Film Packaging
		Other Film
	Durable Plastic Items	HDPE Buckets
		#3-#7 Buckets
		Durable Plastic Items
	Remainder/Composite Plastic	Remainder/Composite Plastic
Other Organic	Food	Food
	Leaves and Grass	Leaves and Grass
	Prunings and Trimmings	Prunings and Trimmings
	Branches and Stumps	Branches and Stumps
	Manures	Manures
	Textiles	Textiles
	Carpet	Carpet
	Remainder/Composite Organic	Remainder/Composite Organic
Inerts and Other	Concrete	Concrete
	Asphalt Paving	Asphalt Paving
	Asphalt Roofing	Asphalt Composition Shingles
		Roofing Tar Paper/Felt
		Roofing Mastic
		Built-up Roofing
		Other Asphalt Roofing Material
	Lumber	Clean Dimensional Lumber
		Clean Engineered Wood
		Clean Pallets and Crates
		Other Wood Waste
	Gypsum Board	Clean Gypsum Board
		Painted/Demolition Gypsum Board
	Rock, Soil and Fines	Rock, Soil and Fines
	Remainder/Composite Inerts and Other	Remainder/Composite Inerts and Other

Table 48 (cont.)

Category	2008 Standard Material List	2008 Expanded Material List
Household Hazardous	Paint	Paint
	Vehicle & Equipment Fluids	Vehicle & Equipment Fluids
	Used Oil	Used Oil
	Batteries	Lead-acid (automotive) Batteries
		Other Batteries
	Remainder/Composite Household Hazardous	Sharps
		Pharmaceuticals
		Fluorescent Lights/Other Mercury-containing Items
		Remainder/Composite Household Hazardous
Special Waste	Ash	Ash
	Treated Medical Waste	Treated Medical Waste
	Bulky Items	Bulky Items
	Tires	Vehicle and Truck Tires
		Other Tires
	Remainder/Composite Special Waste	Remainder/Composite Special Waste
Mixed Residue	Mixed Residue	Mixed Residue

Definitions of Material Types (Expanded List)

Paper

1. **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 boxes such as cereal and tissue boxes.

2. **Paper Bags** means bags and sheets made from kraft paper. The paper may be brown (unbleached) or white (bleached). Examples include paper grocery bags, fast food bags, department store bags, and heavyweight sheets of kraft packing paper.

3. **Newspaper** means paper used in newspapers. Examples include newspaper and glossy inserts found in newspapers, and all items made from newsprint, such as free advertising guides, election guides, and tax instruction booklets.

4. **White Ledger Paper** means bleached, uncolored bond, rag, or stationery grade paper, without ground wood fibers. It may have colored ink on it. When the paper is torn, the fibers are white. Examples include white paper used in photocopiers and laser printers, and letter paper.

5. **Other Office Paper** means paper used in offices other than white ledger paper. Examples include colored ledger, computer paper, manila folders, manila envelopes, index cards, white envelopes, white window envelopes, notebook paper, ground wood computer paper, junk mail, and carbonless forms.

6. **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.

7. **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.

8. **Other Miscellaneous Paper – Non-food Packaging** means items made mostly of paper that are used for packaging things other than food, and that do not fit into any of the other paper types. Paper may be combined with minor amounts of other materials such as wax or glues. Examples include chipboard packaging like tissue boxes, paperboard boxes for software, paper sleeves for CD or DVD cases, paper packaging for over-the-counter medications, boxes for games, containers for printer ink or toner cartridges, and non-corrugated consumer electronics packaging.

9. **All Other Miscellaneous Paper** means items made mostly of paper that do not fit into any of the other paper types that are also not packaging for items other than food. Paper may be combined with minor amounts of other materials such as wax or glues. This type includes items made of chipboard, ground wood 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, pulp paper egg cartons, unused pulp paper plant pots, and hard cover and soft cover books.

10. **Remainder/Composite Paper – Non-food Packaging** means items used for packaging things other than food that are made mostly of paper but combined with large amounts of other materials such as wax, plastic, glues, foil, food, and moisture. Examples include packages laminated with Mylar, boxes with large plastic windows (common for children's toys), and packages with foam or plastic cushions integrated into the package, paper-coated polystyrene containers.

11. **All Other 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, that also are not packaging for items other than food. Examples include some waxed or plastic-impregnated corrugated cardboard (common for packaging produce or seafood), aseptic packages, plastic-coated paper milk cartons, waxed paper, tissue, paper towels, blueprints, sepia, onion skin, fast food wrappers, carbon paper, self adhesive notes, and photographs.

Glass

12. **Clear Glass Bottles and Containers** means clear glass containers with or without a California Redemption Value (CRV) label. Examples include whole or broken clear soda and beer bottles, fruit juice bottles, peanut butter jars, and mayonnaise jars.

13. **Green Glass Bottles and Containers** means green-colored glass containers with or without a CRV label. Examples include whole or broken green soda and beer bottles, and whole or broken green wine bottles.

14. **Brown Glass Bottles and Containers** means brown-colored glass containers with or without a CRV label. Examples include whole or broken brown soda and beer bottles, and whole or broken brown wine bottles.

15. **Other Colored Glass Bottles and Containers** means colored glass containers and bottles other than green or brown with or without a CRV label. Examples include whole or broken blue or other colored bottles and containers.

16. **Flat Glass** means clear or tinted glass that is flat. Examples include glass window panes, doors and table tops, flat automotive window glass (side windows), safety glass, and architectural glass. This type does not include windshields, laminated glass, or any curved glass.

17. **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, auto windshields, laminated glass, or any curved glass.

Metal

18. **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.

19. **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.

20. **Used Oil Filters** means metal oil filters used in motor vehicles and other engines, which contain a residue of used oil. Note: This type was classified under Other Ferrous in the original 57 standard *material types* used in the 1999 Statewide Study and the solid waste characterization database.

21. **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.

22. **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.

23. **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.

24. **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 metal 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.

Electronics

25. **Brown Goods** means generally larger, non-portable electronic goods that have some circuitry. Examples include microwaves, stereos, VCRs, DVD players, large radios, and audio/visual equipment. Does not include items with video display devices. Note: This type was classified under Remainder/Composite Metal in the original 57 standard *material types* used in the 1999 Statewide Study and the solid waste characterization database.

26. **Computer-related Electronics – Large** means electronics with large circuitry that is computer-related, not including monitors. Items in this category should be larger than a basketball. Examples include processors, keyboards, printers, and fax machines. Note: This type was classified under Remainder/Composite Metal in the original 57 standard *material types* used in the 1999 Statewide Study and the solid waste characterization database.

27. **Computer-related Electronics – Small** means electronics with large circuitry that is computer-related, not including monitors. Items in this category should be smaller than a basketball. Examples include mice, disk drives, and modems. Note: This type was classified under Remainder/Composite Metal in the original 57 standard *material types* used in the 1999 Statewide Study and the solid waste characterization database.

28. **Other Small Consumer Electronics** means portable non-computer-related electronics with large circuitry. Examples include personal digital assistants (PDA), cell phones, phone systems, phone answering machines, computer games and other electronic toys, portable CD players, camcorders, and digital cameras. Note: This type was classified under

Remainder/Composite Metal in the original 57 standard *material types* used in the 1999 Statewide Study and the solid waste characterization database.

29. **Video Display Devices** means items with video displays larger than 4 inches. Includes televisions, computer monitors, and other items containing a cathode ray tube (CRT), portable DVD players, laptop computers, and non-CRT televisions (such as LCD televisions). Note: This type was classified under Remainder/Composite Metal in the original 57 standard *material types* used in the 1999 Statewide Study and the solid waste characterization database.

Plastics

30. **PETE Water Bottles** means clear or colored PETE (polyethylene terephthalate) bottles for non-carbonated water that are one liter or less in size. When marked for identification, they bear the number 1 in the center of the triangular recycling symbol and may also bear the letters PETE or PET. The color is usually transparent green or clear. A PETE water bottle usually has ribs and a narrow neck as well as a small dot left from the manufacturing process, not a seam. It does not turn white when bent. Examples include single-serve plain water bottles, flavored water bottles, and vitamin, mineral, or otherwise enhanced water bottles.

31. **PETE Sealed Containers** means PETE (polyethylene terephthalate) containers that must be cut, pried, or torn to be opened, and have 2 or more parts, which may be hinged or fitted, that are sealed together. When marked for identification, they bear the number 1 in the center of the triangular recycling symbol and may also bear the letters PETE or PET. A PETE sealed container may have a small dot left from the manufacturing process. Examples include hardware, small electronics and battery packaging; these containers may be clear but could also be colored.

32. **Other PETE Containers** means PETE (polyethylene terephthalate) containers other than water bottles and sealed containers. This includes boxes, clamshells, jars, bottles, and cartons. When marked for identification, they bear the number 1 in the center of the triangular recycling symbol and may also bear the letters PETE or PET. A PETE container usually has a small dot left from the manufacturing process, not a seam. It does not turn white when bent. Examples include soft drink and liquor bottles, water bottles larger than 1 liter in size, cooking oil bottles, pastry jars, food jars, aspirin bottles, and frozen food or other trays.

33. **PLA Water Bottles** means clear or colored PLA (polylactic acid) water bottles. The bottle may not be marked with a recycling code for identification. However, the label on the bottle may claim that the container is “degradable,” “biodegradable,” or “compostable.” The container may also bear the letters “PLA.” The color is usually clear or blue tinted. A PLA water bottle usually has ribs and a narrow neck as well as a small dot left from the manufacturing process, not a seam. Major brand names that may appear on the label of PLA water bottles include the “Biota” brand (www.biotaspringwater.com) or “Belu” (www.belu.org) brand name. PLA containers will have a very similar appearance to PETE containers, but will be distinguishable based on the label (degradable claim or marked with “PLA” lettering or above brand names) and by absence of the triangular recycling symbol, although it is possible that the symbol may be included on the container with the number “7.”

34. **HDPE Containers** means natural and colored HDPE (high-density polyethylene) containers, not including HDPE buckets of five gallons or less in size. This plastic is usually either cloudy white, allowing light to pass through it (natural) or a solid color, preventing light from

passing through it (colored). When marked for identification, it bears the number 2 in the triangular recycling symbol and may also bear the letters HDPE. Examples include milk jugs, water jugs, detergent bottles, some hair-care bottles, HDPE sealed containers (must be cut, pried, or torn to be opened), empty motor oil, empty antifreeze, and other empty vehicle and equipment fluid containers.

35. **#3-#7 Sealed Containers** means containers made of types of plastic other than HDPE (high-density polyethylene) or PETE (polyethylene terephthalate) that must be cut, pried or torn to be opened, and have two or more parts, which may be hinged or fitted, that are sealed together. Items may be made of PVC (polyvinyl chloride), LDPE (low-density polyethylene), PP (polypropylene), PS (polystyrene), or mixed resins. When marked for identification, these items may bear the number 3, 4, 5, 6, or 7 in the triangular recycling symbol and may also bear letters (PS, PP, PVC, etc). Examples include hardware, small electronics and battery packaging; these containers may be clear but could also be colored.

36. **#3-#7 Other Containers** means plastic containers other than sealed containers and #3-#7 buckets of five gallons or less in size, made of types of plastic other than HDPE (high-density polyethylene) or PETE (polyethylene terephthalate) that include boxes, clamshells, jars, bottles, and cartons. Items may be made of PVC (polyvinyl chloride), LDPE (low-density polyethylene), PP (polypropylene), PS (polystyrene), or mixed resins. When marked for identification, these items may bear the number 3, 4, 5, 6, or 7 in the triangular recycling symbol and may also bear the letters PS, PP, PVC, etc. Examples include bakery packaging with hinged lids, hardware and fastener packaging, food containers such as bottles for salad dressings and vegetable oils, flexible and brittle yogurt cups, syrup bottles, margarine tubs, microwave food trays, and clamshell-shaped fast food containers. This type also includes some shampoo containers, vitamin bottles, foam egg cartons, and clamshell-like muffin containers.

37. **Plastic Trash Bags** means plastic bags sold for use as trash bags, for both residential and commercial use. This type includes garbage, kitchen, compactor, can-liner, composting, yard, lawn, leaf, and recycling bags. This type does not include other plastic bags, like shopping bags, that might have been used to contain trash. Note: This type was classified under Film Plastic in the original 57 standard *material types* used in the 1999 Statewide Study and the solid waste characterization database.

38. **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. This type includes dry cleaning bags intended for one-time use. Does not include produce bags. Note: This type was classified under Film Plastic in the original 57 standard *material types* used in the 1999 Statewide Study and the solid waste characterization database.

39. **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. Note: This type was classified under Film Plastic in the original 57 standard *material types* used in the 1999 Statewide Study and the solid waste characterization database.

40. **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. Note: This type was classified under Film Plastic in the original 57

standard *material types* used in the 1999 Statewide Study and the solid waste characterization database.

41. **Food Contact Film Packaging** means all plastic film used as food packaging, i.e., was sold holding a food product. This type does not include plastic carryout bags or bags that were purchased separately and later used to hold food (such as sandwich bags). Examples include produce bags, frozen vegetable bags, bread bags, food wrappers such as candy bar wrappers, deli bags, and other point-of purchase plastic film packaging with a label or sticker.

42. **Other Film** means all other plastic film that does not fit into any other type. Examples include other types of plastic bags such as sandwich bags, zipper-recloseable bags, newspaper bags, mailing pouches, bank bags, X-ray film, and metalized film (wine containers and balloons). Note: This type was classified under Film Plastic in the original 57 standard *material types* used in the 1999 Statewide Study and the solid waste characterization database.

43. **HDPE Buckets** means colored and natural buckets and pails made of HDPE (high-density polyethylene) and designed to hold five gallons or less of material. This plastic is usually either cloudy white, allowing light to pass through it (natural) or a solid color, preventing light from passing through it (colored). When marked for identification, it bears the number 2 in the triangular recycling symbol and may also bear the letters HDPE. This category includes buckets regardless of whether they are attached to metal handles. Examples include large paint buckets and commercial buckets used to contain food for commercial use (restaurants, etc.). These objects are packages containing material for sale, and are not sold as buckets themselves (such as mop buckets).

44. **#3-#7 Buckets** means all types of buckets and pails made of plastic other than HDPE or PETE and designed to hold five gallons or less of material. This category includes buckets regardless of whether they are attached to metal handles. Items may be made of PVC (polyvinyl chloride), LDPE (low-density polyethylene), PP (polypropylene), PS (polystyrene), or mixed resins. When marked for identification, these items bear the number 3, 4, 5, 6, or 7 in the triangular recycling symbol. Examples include large paint buckets and commercial buckets used to contain food for commercial use (restaurants, etc.). These objects are packages containing material for sale, and are not sold as buckets themselves (such as mop buckets).

45. **Durable Plastic Items** means plastic items other than containers, film plastic, HDPE buckets, or #3-#7 buckets that are often made to last for more than one use. These items may bear the numbers 1 through 7 in the triangular recycling symbol. Examples include plastic outdoor furniture, plastic toys and sporting goods, CDs, and plastic housewares, such as mop buckets, 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-resistant cases such as tool boxes and first aid boxes, and plastic pipes and fittings.

46. **Remainder/Composite Plastic** means plastic that cannot be put in any other type. These items 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 packing blocks, packing peanuts, cookie trays found in cookie packages, plastic strapping, foam plates/bowls, and new Formica, vinyl, or linoleum.

Other Organic

47. **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.

48. **Leaves and Grass** means plant material, except woody material, from any public or private landscape. Examples include leaves, grass clippings, plants, and seaweed. This type does not include woody material or material from agricultural sources.

49. **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 four inches. This type does not include stumps, tree trunks, branches exceeding four inches in diameter, or material from agricultural sources.

50. **Branches and Stumps** means woody plant material, branches, and stumps that exceed four inches in diameter, from any public or private landscape.

51. **Manures** means manure and soiled bedding materials from domestic, farm, or ranch animals. Examples include manure and soiled bedding from animal production operations, race tracks, riding stables, animal hospitals, and other sources.

52. **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.

53. **Carpet** means flooring applications consisting of various natural or synthetic fibers bonded to some type of backing material. This type does not include carpet padding. Note: This type was classified under Remainder/Composite Organic in the original 57 standard *material types* used in the 1999 Statewide Study and the solid waste characterization database.

54. **Remainder/Composite Organic** means organic material that cannot be put in any other type. This type includes items made mostly of organic materials, but combined with other *material types*. Examples include leather items, cork, hemp rope, garden hoses, rubber items, hair, carpet padding, cigarette butts, diapers, feminine hygiene products, small wood products (such as Popsicle sticks and tooth picks), sawdust, agricultural crop residues, and animal feces.

Inerts and Other

Note: To reduce confusion surrounding the amount of debris disposed from construction and demolition activities, the **Inerts and Others** class replaces the Construction and Demolition class from the 1999 and 2004 studies.

55. **Concrete** means a hard material made from sand, aggregate, gravel, cement mix and water. Examples include pieces of building foundations, concrete paving, and concrete/cinder blocks.

56. **Asphalt Paving** means a black or brown, tar-like material mixed with aggregate used as a paving material.

57. **Asphalt Composition Shingles** means composite shingles composed of fiberglass or organic felts saturated with asphalt and covered with inert aggregates. Does not include built-up roofing. Commonly known as three tab roofing.

58. **Roofing Tar Paper/Felt** means a heavy paper impregnated with tar or a fiberglass or polyester fleece impregnated with tar and used as part of a roof for waterproofing.

59. **Roofing Mastic** means a paste-like material used as an adhesive or seal in roofing applications.

60. **Built-up Roofing** means other roofing material made with layers of felt, asphalt, aggregates, and attached roofing tar and tar paper normally used on flat/low pitched roofs usually on commercial buildings.

61. **Other Asphalt Roofing Material** means any other roofing material containing asphalt that cannot be put into any of the other roofing *material types*.

62. **Clean Dimensional Lumber** means unpainted new or demolition dimensional lumber. Includes materials such as 2x4s, 2x6s, 2x12s, and other residual materials from framing and related construction activities. May contain nails or other trace contaminants.

63. **Clean Engineered Wood** means unpainted new or demolition scrap from sheeted goods such as plywood, particleboard, wafer board, oriented strand board, and other residual materials used for sheathing and related construction uses. May contain nails or other trace contaminants.

64. **Clean Pallets and Crates** means unpainted wood pallets, crates, and packaging made of lumber/engineered wood.

65. **Other Wood Waste** means wood waste that cannot be put into any other material type. This type may include untreated/unpainted scrap from production of prefabricated wood products such as wood furniture or cabinets, untreated or unpainted wood roofing and siding, painted or stained wood, and treated wood.

66. **Clean Gypsum Board** means unpainted gypsum wallboard or interior wall covering made of a sheet of gypsum sandwiched between paper layers. Examples include used or unused, broken or whole sheets. Gypsum board may also be called Sheetrock, drywall, plasterboard, gypboard, Gyproc, or wallboard.

67. **Painted/Demolition Gypsum Board** means painted gypsum wallboard or interior wall covering made of a sheet of gypsum sandwiched between paper layers. Examples: This type includes used or unused, broken or whole sheets. Gypsum board may also be called Sheetrock, drywall, plasterboard, gypboard, Gyproc, or wallboard.

68. **Rock, Soil and Fines** means rock pieces of any size and soil, dirt, and other matter. Examples include rock, stones, sand, clay, soil, and other fines. This type also includes non-hazardous contaminated soil.

69. **Remainder/Composite Inerts and Other** means inerts and other material that cannot be put in any other type. This type may include items from different types combined, which would be very hard to separate. Examples include brick, ceramics, tiles, toilets, sinks, 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.

Household Hazardous Waste

70. **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.

71. **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.

72. **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.

73. **Lead-acid (automotive) Batteries** means batteries fueled by lead-acid cells, such as auto batteries.

74. **Other Batteries** means any type of battery other than lead-acid (automotive) batteries. Examples include household batteries such as AA, AAA, D, button cell, 9 volt, and rechargeable batteries used for flashlights, small appliances, watches, and hearing aids.

75. **Sharps** means hypodermic needles, pen needles, intravenous needles, lancets, and other devices that are used to penetrate the skin for the delivery of medications derived from sources other than medical facilities.

76. **Pharmaceuticals** means both prescription and over-the-counter medications and supplements in all forms, including pills, liquid medications, creams, and ointments. Does not include containers for these items, except for tubes for creams and ointments and other containers that cannot be easily separated from the product they contain.

77. **Fluorescent Lights and Other Mercury-containing Items** means both compact and tube-style fluorescent lights, thermostats, thermometers, and other items that are readily identifiable as containing mercury. Since some mercury-containing items are not identifiable in the field, data for this material type should not be considered to be comprehensive.

78. **Remainder/Composite Household Hazardous** means household hazardous material that cannot be put in any other type. This type also includes household hazardous material that is mixed. Examples include household hazardous waste which if improperly put in the solid waste stream may present handling problems or other hazards, such as pesticides and caustic cleaners.

Special Waste

79. **Ash** means a residue from the combustion of any solid or liquid material. Examples include ash from fireplaces, incinerators, biomass facilities, waste-to-energy facilities, and barbecues. This type also includes ash and burned debris from structure fires.

80. **Treated Medical Waste** means medical waste that has been processed in order to change its physical, chemical, or biological character or composition, or to remove or reduce its harmful properties or characteristics, as defined in Section 25123.5 of the Health and Safety Code.

81. **Bulky Items** means large hard to handle items that are not defined elsewhere in the *material types* list, including furniture, mattresses, and other large items. Examples include all sizes and types of furniture, mattresses, box springs, and base components.

82. **Vehicle and Truck Tires** means pneumatic tires or solid tires manufactured for use on any type of motor vehicle such as trucks, automobiles, motorcycles, and heavy equipment.

83. **Other Tires** means tires not used on motor vehicles such as bicycle tires and lawn mower tires.

84. **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, and artificial fireplace logs.

Mixed Residue

85. **Mixed Residue** means material that cannot be put in any other type or category. This category includes mixed residue that cannot be further sorted. Examples include clumping kitty litter, cosmetics, and residual material from a materials recovery facility or other sorting process that cannot be put in any other material type, including remainder/composite types.

Appendix C: Forms Used in the Study

List of Forms Used

Examples of the field forms used in the study appear in this appendix in the following order:

- Vehicle Selection Form;
- Sample Placard;
- Sample Sorting & Characterization Form;
- Vehicle Survey Form;
- Snapshot of Multifamily Site Recruitment Database;
- Multifamily Site Visit Form;
- Roofing Sample Form;
- Special Study Form;
- Solid Waste Facility Recruitment Form;
- Snapshot of Waste Composition Data Entry Database; and
- Snapshot of Vehicle Survey Data Entry Spreadsheet

Vehicle Selection Form

CIWMB 2008 Waste Characterization Study
Vehicle Selection Form

Site: Lamb

Date: November 7, 2008 **Goal:** 16 **Samples Total**

Each number represents an expected vehicle based on the available data.

Cross off one number for each category of vehicle entering the landfill.

When you reach the number circled, ask this vehicle to go to the sorting area.

When you reach the number with an "S" on it, ask this vehicle to go to the sorting area.

Ask all pure roofing loads to go to the sorting area for asbestos subsample. Only the roofing loads that are selected through the random selection process should be sorted.

RESIDENTIAL: (Res 2-6) **NEED** 5 **TOTAL**

**Must be at least 80% single-family residential waste.*

(1) 2 [ ] 4 5 (6) [ ] 8 9 10 (11) [ ] 13 14 15 (16) 17 18 19 (20)

(expect 15)

COMMERCIAL: (Com 1-4) **NEED** 4 **TOTAL**

**Must be at least 80% commercial waste.*

1 2 (3) 4 5 [ ] 7 (8) 9 10 11 [ ] (13) 14 15 16 17 (18) 19 20
21 22 23 24 25 26 27 28 29 30 31 32 33 34 [ ] 36 37 38 39 40
41 42 43 [ ] 45 46 47 48 49 50 51 52 53 54 55 56 57 58 [ ] 60
61 62 63 64 65 66 67

(expect 67)

SELF HAULED: (SH 1-6) **NEED** 6 **TOTAL**

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20
21 22 23 24 25 26 27 28 29 30 31 32 33 34 [ ] 36 37 38 39 40
41 42 43 (44) 45 46 47 48 49 50 51 52 53 54 (55) 56 57 58 59 60
61 62 63 [ ] 65 66 67 68 69 70 71 72 73 74 [ ] 76 77 78 79 80
81 82 83 (84) 85 86 87 88 89 90 91 92 93 94 (95) 96 97 98 99 100
101 102 103 [ ] 105 106 107 108 109 110 111 112 113 114 [ ] 116 117 118 119 120
121 122 123 (124) 125 126 127 128 129 130 131 132 133 134 (135) 136 137 138 139 140
141 142 143 [ ] 145 146 147 148 149 150 151 152 153 154 [ ] 156 157 158 159 160
161 162 163 164 165 166 167 168 169 170 171 172 173 174 175 176 177 178 179 180

(expect 175)

Multi-family Generator Sample (Res-1) **NEED** 1 **TOTAL**

(1)

Sample Placard

Cell Number : 5

Lamb Com - 1

11/7/2008

- ☐ WC & Special Study
- ☐ Divertibility Study
- ☐ Special Study
- ☐ Roofing Subsample

Sample Sorting & Characterization Form (front)

CIWMB Waste Characterization 2008

PAPER			
OCC (Clean)			
(Load Contaminated)			
(Source Contaminated)			
Kraft Bags (Clean)			
(Load Contaminated)			
(Source Contaminated)			
Newspaper (Clean)			
(Load Contaminated)			
(Source Contaminated)			
White Ledger (Clean)			
(Load Contaminated)			
(Source Contaminated)			
Office Paper (Clean)			
(Load Contaminated)			
(Source Contaminated)			
Low Grade (Clean)			
(Load Contaminated)			
(Source Contaminated)			
Non-Food Pkg: LG			
R/C Paper (Clean)			
(Load Contaminated)			
(Source Contaminated)			
Non-Food Pkg: R/C			
Magazines/Catalogs			
Phone Book/Directory			

PLASTIC			
PET Water (Clean)			
(Load Contaminated)			
(Source Contaminated)			
PET Sealed (Clean)			
(Load Contaminated)			
(Source Contaminated)			
PET Containers (Clean)			
(Load Contaminated)			
(Source Contaminated)			
HDPE Containers (Clean)			
(Load Contaminated)			
(Source Contaminated)			
#3-#7 Sealed (Clean)			
(Load Contaminated)			
(Source Contaminated)			
#3-#7 Containers (Clean)			
(Load Contaminated)			
(Source Contaminated)			
HDPE Buckets			
#3-#7 Buckets			
PLA Water Bottles			
Trash Bags			
Grocery/Merch Bags			
Commercial Film			
Film Products			
Food Film			
Other Film			
Durable Products			
R/C Plastic			

Sample ID

Date

PHOTO TAKEN

SECTOR: (circle)
SF - Single Family
MF - Multi-Family
COM - Commercial
SHC - SH Com
SHOC - SH Other Com
SHR - SH Res

☐ Divertibility Sample?

☐ Grocery Bag Sample?

GLASS			
Clear Containers			
Green Containers			
Brown Containers			
Other Containers			
Flat Glass			
R/C Glass			

METAL			
Tin Cans (Clean)			
(Load Contaminated)			
(Source Contaminated)			
Aluminum Cans (Clean)			
(Load Contaminated)			
(Source Contaminated)			
Other Non-Ferrous			
Other Ferrous			
Major Appliances			
Used Oil Filters			
R/C Metal			

CIWMB Waste Characterization 2008

If found please call 206-343-9759. Reward offered.

If found please call, 206-343-9759. Reward offered.

Sample Sorting & Characterization Form (back)

CIWMB Waste Characterization 2008

C & D / WOOD

Concrete			
Asphalt Paving			
Asphalt Shingles			
Tar Paper/Felt			
Roofing Mastic			
Built-up Roofing			
Other Asphalt Roofing			
Dimensional Lumber			
Engineered Wood			
Pallets & Crates			
Other Wood			
Clean Gypsum Board			
Painted Gypsum Board			
Rock, Soil & Fines			
R/C Demo			

SPECIAL WASTE

Ash			
Sewage Solids			
Industrial Sludge			
Treated Medical			
Bulky Items			
Vehicle Tires			
Other Tires			
R/C Special			

OTHER ORGANICS

Food			
(_____ % Leaves) & Grass			
Small Prunings <4"			
Branches & Stumps			
Manures			
Textiles			
Carpet			
R/C Organic			

ELECTRONICS

Brown Goods			
Large Computer			
Small Computer			
Small Electronics			
Display Devices			

HAZARDOUS WASTE

Paint			
Vehicle Fluids			
Used Oil			
Lead-acid Batteries			
Other Batteries			
Sharps			
Pharmaceuticals (w/o cont.)			
Fluorescents/Mercury Items			
R/C Hazardous			

MIXED RESIDUE

Mixed Residue			

CIWMB Waste Characterization 2008

If found please call 206-343-9759. Reward offered.

NOTES:

Sharps Count:

If found please call, 206-343-9759. Reward offered.

Vehicle Survey Form (front)

Date ___/___/___
Survey Site ____________________
Minimum weight at this site ____________

CIWMB Waste Characterization Study 2008

Surveyor ____________________
Checked by ____________________

Page ____ of ____
This sheet started at ________ am pm

All Vehicles									*If Non-C&D Com Self-Haul*	*MRF residuals ?*				*Sorted Load?*	*Surveyor's Notes*
ID	Vehicle Type	Jurisdiction	Sector					From Construction Site?			Net Weight of Load				If needed for net weights, record license/ticket #s here.
	1. Packer 2. DB, Loose 3. DB, Cmpctd 4. Pick-up, Van, SUV, Bx Truck 5. Car 6. Semi Truck	Please list the city of origin that the waste came from	SF single-family residential MF multifamily residential COM commercial CSH commercial self-haul RSH residential self-haul *If 100%, just check box. If not, fill out percents (must total 100%).*					If no — No = Not from Const. Site If yes — N=new construction, R=remodel, D=demolition, RF=roofing, OC=other c&d	Activity that Generated Self-Haul Waste L = Landscaping O = Other self-haul	Y = Yes N = No	Circle units if they aren't all the same. Default units *(circle one)* **tons lbs yds**	Alternative minumum weight (choose car or pick-up)		Put an X in the box if the load was sampled	
			% SF	%MF	%COM	%CSH	%RSH					*Car*	*Pickup*		
								No N R D RF OC	L O	Y N	tons lbs yds				
								No N R D RF OC	L O	Y N	tons lbs yds				
								No N R D RF OC	L O	Y N	tons lbs yds				
								No N R D RF OC	L O	Y N	tons lbs yds				
								No N R D RF OC	L O	Y N	tons lbs yds				
								No N R D RF OC	L O	Y N	tons lbs yds				
								No N R D RF OC	L O	Y N	tons lbs yds				
								No N R D RF OC	L O	Y N	tons lbs yds				
								No N R D RF OC	L O	Y N	tons lbs yds				
								No N R D RF OC	L O	Y N	tons lbs yds				
								No N R D RF OC	L O	Y N	tons lbs yds				
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								No N R D RF OC	L O	Y N	tons lbs yds				

If found please call, 206-343-9759. Reward offered.

Vehicle Survey Form (back)

GENERAL INSTRUCTIONS CIWMB Waste Characterization Study 2008

Make entries neatly in pen.
Enter the information at the top of each page. Enter total # of pages on each page at the end of the day.
Enter the net weight of the load. If the operator measures self-haul loads by volume, record the volume and indicate that the unit is "yds".
If the load is from a construction site, circle only one of the activities in the For Construstion Site? column.
If load is not
If it's a commercial hauler askif load is MRF residuals.
If you make an error on an entry, draw a line through the entire entry and start over on a new line.

STEP-BY-STEP INSTRUCTIONS

CHECK IN WITH GATEHOUSE STAFF

Confirm the method for getting net weights.

AS THE VEHICLE ARRIVES RECORD THE TYPE OF VEHICLE ON THE SURVEY SHEET

WHEN A VEHICLE ARRIVES, STOP THE VEHICLE, THEN BEGIN QUESTIONS:

ALL DRIVERS:

Introduction: "Hello, the California Integrated Waste Management Board is conducting a survey today."
Ask the driver what **sector** generated the load

If you circle more than one sector, be sure to ask the driver for the estimated % of each.

Commercially collected residential: Single-family (SF)	Waste that is collected by a commercial hauler from single-family residences
Commercially collected residential: Multifamily (MF)	Waste that is collected by a commercial hauler from multi-unit structures with greater than 4 units
Commercially collected commercial (COM)	Waste disposed by businesses, industries (factories, farms, etc.), and governments (schools, highways, parks,
Self-hauled residential (RSH)	Waste hauled to a disposal site by a resident from their home
Self-hauled commercial (CSH)	Waste hauled to a disposal site by commercial enterprise (e.g. landscaper, contractor, etc.), even if source of

ASK THE DRIVER IS THE LOAD IS FROM A CONSTRUCTION SITE.

IF DRIVER IS FROM A CONSTRUCTION SITE, ASK:

If it is a C&D load, ask the driver what **activity** generated the waste.

New construction (NC)	Construction materials generated from the construction of new buildings
Remodel (R)	Construction or demolition materials generated from the remodeling of buildings
Demolition (D)	Materials generated from the tearing down of any facility, structure, pavement or building, (wall, fence) whether in whole or in part, whether interior or exterior
Roofing (RF)	Waste generated by the installation or replacement of roofs
Other construction & demolition (OC)	Waste generated by construction or demolition of buildings, not included in categories above

IF DRIVER IS NOT FROM A CONSTRUCTION SITE, ASK:

If it is a not C&D load, ask the driver what **activity** generated the waste.

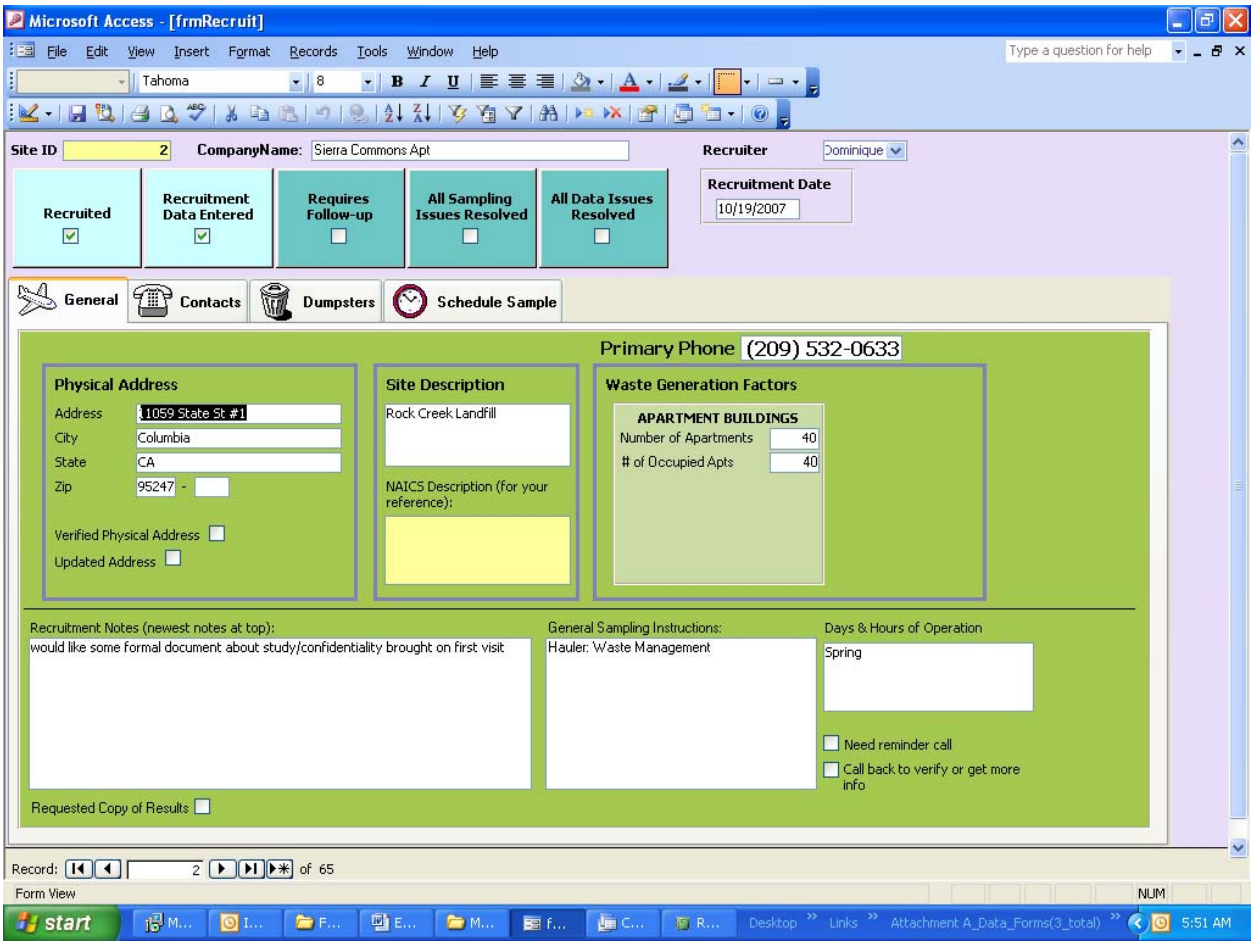
Landscaping (L)	Waste generated by landscaping or other yard care activities
Other (O)	Waste not included in above categories

ASK COMMERCIALLY HAULED LOADS IF LOAD CONTAINS MRF RESIDUALS

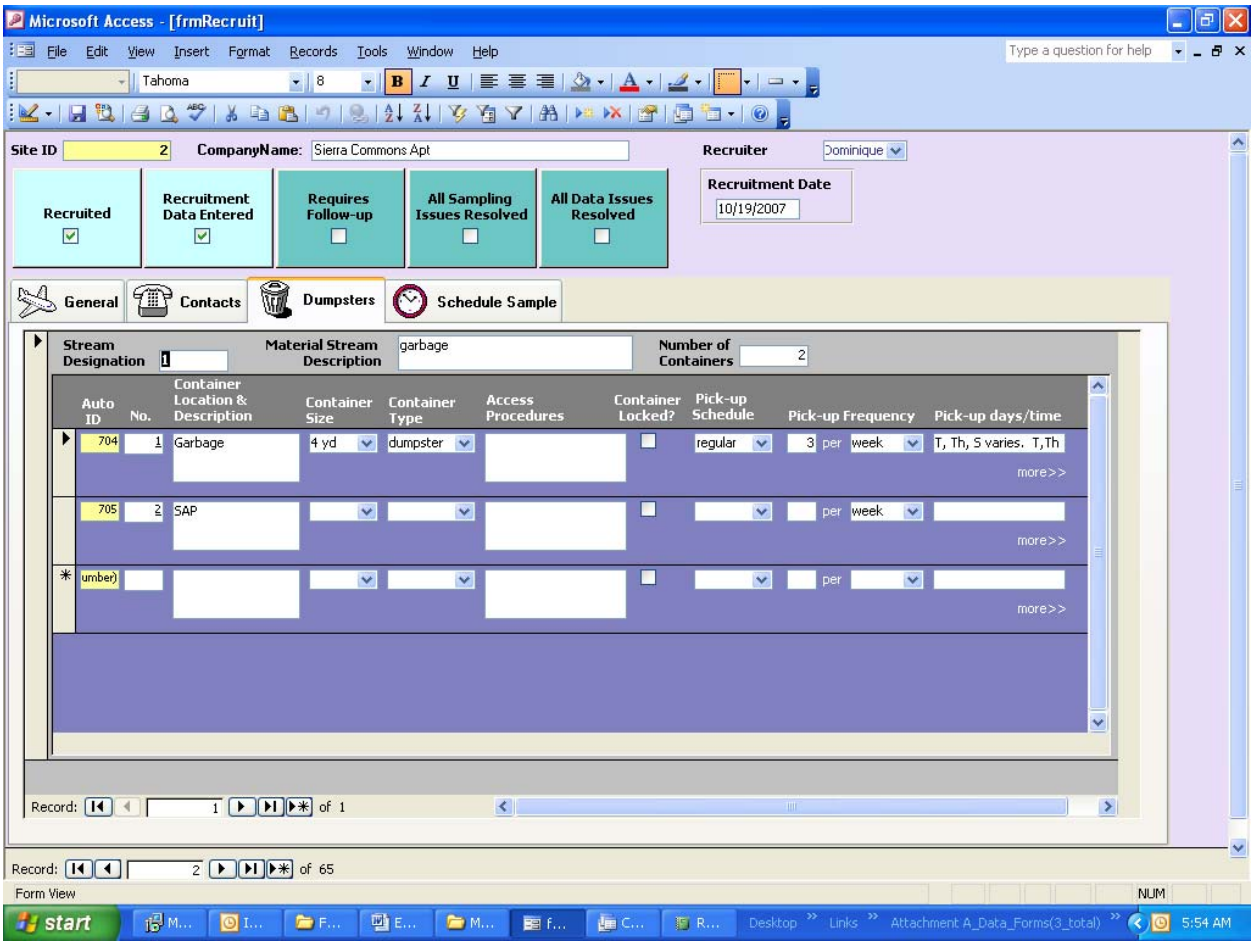
RECORD NET WEIGHTS

If found please call, 206-343-9759. Reward offered.

Snapshot of Multifamily Site Recruitment Database (Page 1)



Snapshot of Multifamily Site Recruitment Database (Page 2)



Multifamily Site Visit Form (page 1)

La Roca Plaza Apts. 10/27/2008

[redacted]
Santee 92071

Sampling Season:
Fall

On-site Contact: [redacted]
Manager
Phone: [redacted]
Other contacts:
Permission: [redacted]
Manager
Data: [redacted]
Manager
General Phone: [redacted]

Sampling Facility:
Sycamore Sanitary Landfill

Hauler:

Substream #1 : MSW

Container # **1** Description: **W/M**

Type: **dumpster**

Sampling Window:

Locked? ☐

Access Procedures: None

Pick-up Schedule: 2 time(s) per week Monday/Thursday regular

Trash is taken out: -

Before sampling: inches

Width Length Height

After sampling: inches

Width Length Height

Time of Measurements:

Time of Last Pick-up:

Multifamily Site Visit Form (Page 2)

Substream #1 : MSW

Container # **2** Description: **SAP**

Type: **dumpster**

Sampling Window:

Access Procedures:

Pick-up Schedule: time(s) per

Trash is taken out: -

Locked? ☐

Before sampling: inches

Width Length Height

After sampling: inches

Width Length Height

Time of Measurements:

Time of Last Pick-up:

Container # **3** Description: **SAP**

Type: **dumpster**

Sampling Window:

Access Procedures:

Pick-up Schedule: time(s) per

Trash is taken out: -

Locked? ☐

Before sampling: inches

Width Length Height

After sampling: inches

Width Length Height

Time of Measurements:

Time of Last Pick-up:

Roofing Sample Form

Sample ID	Date	Facility	Sector	Material Type
				CS = Asphalt Roofing Composition Shingles Tar = Roofing Tar Paper/Felt RM = Roofing Mastic BR = Built-up Roofing O = Other Asphalt Roofing Material
ex. SH1 -CS	*15-Jan*	*Bass*	COM RES SH	*CS*
SH1-Tar	*15-Jan*	*Bass*	COM RES SH	*Tar*
			COM RES SH	
			COM RES SH	
			COM RES SH	
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			COM RES SH	

Special Study Form

Sample ID _____ **Survey Site** _____

Date _____/_____/_____ **Surveyor** _____

Please indicate with hash marks the number of each item found in the load.

Tires	
Auto batteries	
Brown goods	
Computer-related electronics - Large	
Video display devices	
Major appliances	

☐ Check here if nothing was found in load.

☐ Check the box if this load was hand sorted.

Solid Waste Facility Recruitment Form (Page 1)

Name of site:

1. SCHEDULE

Range of dates for sampling and surveying: ☐ Jan 9-30, 2008 and July 7-23, 2008
☐ April 7-23, 2008 and Oct 6-24, 2008

Dates that definitely will not work:

Can we have access to a loader? Would it be available throughout the day?

2. TONNAGE & VEHICLE QUANTITIES

Does the facility have a MRF? Yes No
On Average what % of loads are MRF'ed?

How many total tons of disposed waste does the facility receive daily? _____

How many tons from transfer vehicles? _____ biosolids? _____

How many vehicles enter on a weekday, on average?

		Weekday	Saturday	Sunday
Transfer trucks				
Residential-packers				
Haulers with business waste (trucks carrying commercial, industrial, government, military, or multifamily waste)	Roll-offs			
	Packers or compactors			
Self-haul vehicles				
Total Vehicle Count				

Peak times of day on a weekday?
For transfer trucks:
For haulers with residential waste:
For haulers with business waste:
For haulers with C&D waste:
For self-haul vehicles, including contractors and landscapers:

Are there any days during which you do not receive waste from one of these types of loads?

**Can we have one weekday's transaction records?

3. FACILITY CONTACT INFORMATION

Physical address:

City, Zip:

Site owner/operator:

Solid Waste Facility Recruitment Form (Page 2)

Person approving use of the site:
Mailing address:
City, Zip:
Phone:

Person with data about the site:
Phone:
Email:
Fax:

On-site manager or supervisor (primary contact for logistics):
Phone:
Email:
Will this person be available on the indicated dates?

Contact person for crew when they arrive the morning of sampling:
Phone:

Backup contact:
Phone:

Scalehouse contact:
Phone:

Correspondence should be sent to:

4. SITE TRAFFIC INFORMATION

Facility's hours of operation:

M _____
T _____
W _____
Th _____
F _____
Sat _____
Sun_____

Do you accept vehicles before opening the gate to the public?
If so, what hours do vehicles start arriving?

(Fax or e-mail the definitions of waste sectors to the data contact person at the facility.)

Solid Waste Facility Recruitment Form (Page 3)

5. SITE INFORMATION

Do you close early if you have reached your allowed daily tonnage amount? Yes No

Estimate how many times per month this happens. _____/month

Are there site conditions we need to be aware of such as high winds, snakes or other animals, or other special circumstances?

Would it be possible for the sorting crew to be there when the site is closed, for example after hours or on weekends if needed?

How many gatehouses does your facility have? _____
How many scales? _____

Do different types of vehicles go to different gatehouses – i.e., all self-haul going to one scale? If yes, please explain.

6. NET WEIGHT PROCEDURES

Do all vehicles get weighed? If not, which types of vehicles don't get weighed?

Drivers of loads will be surveyed at the entrance throughout the day. The survey is very brief, involving just a few questions. We also will need to learn the net weight of each vehicle that we survey. We may give the driver of each vehicle a numbered card to hand to your gatehouse staff when the driver leaves the facility. Can your gatehouse staff write the net weight of each vehicle on each card?

7. MATERIAL HANDLING

Other than MRFing, what materials are recovered at this site? How and when are vehicles diverted so that recovered materials can be separated from disposed waste?

Material	How and when diverted

The purpose of the study is to take samples of disposed wastes only. How can we sample from vehicles after they have had materials recovered?

Solid Waste Facility Recruitment Form (Page 4)

8. SAMPLING AND SORTING PROCEDURES

We need an area for the sorting crew to work in for the entire time we will be at the site. It should be about the size of two truck bays. Can the site accommodate this? Where do you think that will be?

Crews have hardhats, orange vests, coveralls, boots, and gloves. Are there any other safety equipment or special procedures you want them to use?

We need access to the load for enough time to collect the sample. After a load is tipped on the ground, the sorting crew will designate which part of the load should be picked up by the loader and moved to the sorting area. We expect that it will take from two to five minutes to obtain a sample. Is this okay?

Some loads we will need to leave on the floor five to seven minutes in order to collect sub-samples or characterized other aspects of the load. Is this okay?

9. ADDITIONAL INFORMATION

What hauling companies do you work with primarily? Who should we contact to notify them about the study that will take place on the two days at your facility?

Company:
Contact person:
Phone:
Mailing address:

In order to communicate with all drivers, we will develop translation cards that show the survey questions in several languages. What are the most common languages used by the drivers of vehicles that arrive at your facility?

___ English
___Spanish
___Other: _____

10. FINAL LOGISTICS

Can you please send me a plan or map of the area where we could sample (taken from permit)

Any other special circumstances we need to be aware of?

We will send you a copy of our insurance policy. Is there anything else you need from us?

Please remember to notify gate personnel of the dates we will be visiting your facility.

The CIWMB may wish to set up site visits during sorting for Board staff to observe fieldwork for the project. Is this okay?

Solid Waste Facility Recruitment Form (Page 5)

11. AGRICULTURAL PLASTICS

The Board is collecting information to assist in the development of diversion opportunities for agricultural plastics (as well as other types of plastic).

Does your facility receive any agricultural plastics? Yes No
If yes, see table below

Does your facility have a ban on any agricultural plastic materials? Yes No
If yes, which materials are banned?

Do other facilities within 25 miles have a ban of agricultural plastic materials? Yes No
If yes, which facility or facilities?

Information on agricultural plastic material received:

Type	Annual amount tons (preferred) or cu yd	Source(s) – specific farms, crops, if known	Month(s) of year received
Film – mulch, fumigation			
Film - greenhouse cover (hoop house)			
Film – other (from silage, manure piles, feed bags, etc.)			
Irrigation materials (drip tape, sprinklers, drip tubing, pipe, etc.)			
Pesticide containers			
Nursery containers (pots & trays/flats)			
Other ag plastics			

Do you have any diversion programs/opportunities at your site for agricultural plastics?
Yes No
If yes, describe, include tons diverted

Do you know of any other diversion opportunities/practices in the area for agricultural plastics?
Yes No
If yes, please describe

Do you have any other comments about agricultural plastics?

Solid Waste Facility Recruitment Form (Page 6)

12. SPECIAL ORGANICS

There may be regulatory changes in the future that affect the disposal of certain types of organic materials, i.e., non-disposal options may decrease, which may mean that the disposal of these materials in landfills may be increasing.

Does your facility receive any of the following materials?

Type	Annual amount tons (preferred) or cu yd	Source(s)	Increase in amount received in recent years? (yes, no)
Biosolids (treated sewage sludge)			
Food processing waste			
Manure			
Grape pomace (certain counties only)			

Grape Pomace Counties:

Alameda	El Dorado	Kings	Merced	Sacramento	Santa Barbara	Stanislaus
Amador	Fresno	Lake	Monterey	San Benito	Santa Clara	Tulare
Colusa	Glenn	Madera	Napa	San Joaquin	Solano	Yolo
Contra Costa	Kern	Mendocino	Riverside	San Luis Obispo	Sonoma	

Do you have any other comments?

13. BENEFICIAL RE-USE OF INERT DEBRIS

Background: Facilities must report on alternative daily cover used, but they often lump all beneficial re-use of materials under ADC.

Does your facility use inert debris for beneficial re-use such as road base or wet weather pads?
Yes No

If yes, what are the actual uses and tons of inerts for each?

Type of Use	Tons of Inerts Used

Possible uses are:
alternative daily cover (ADC), alternative intermediate cover (AIC), final cover foundation layer, liner operations layer, leachate and landfill gas collection system, construction fill, road base, wet weather operations pads and access roads, and soil amendments for erosion control and landscaping (reference: Title 27 California Code of Regulations (CCR), Division 2, Subdivision 1, Chapter 3, Subchapter 4, Articles 1, Sections 20510-20660.)

Solid Waste Facility Recruitment Form (Page 7)

14. MRF Residuals

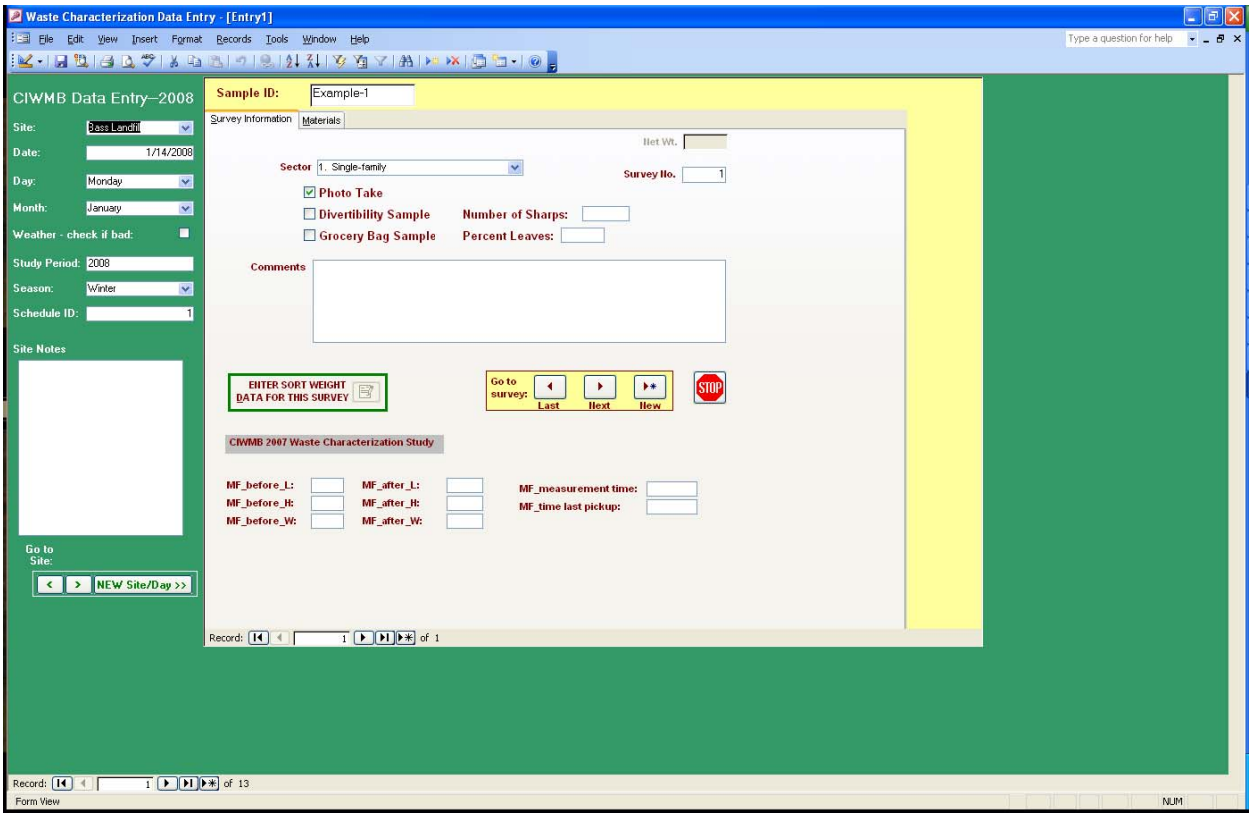
As the Board looks at ways to increase the diversion of materials from landfills, conversion technology (or emerging technology) could be a possible option. MRF residuals could be a feedstock for this new technology.

Does your facility receive any residuals from material recovery facilities (MRFs)? Yes No

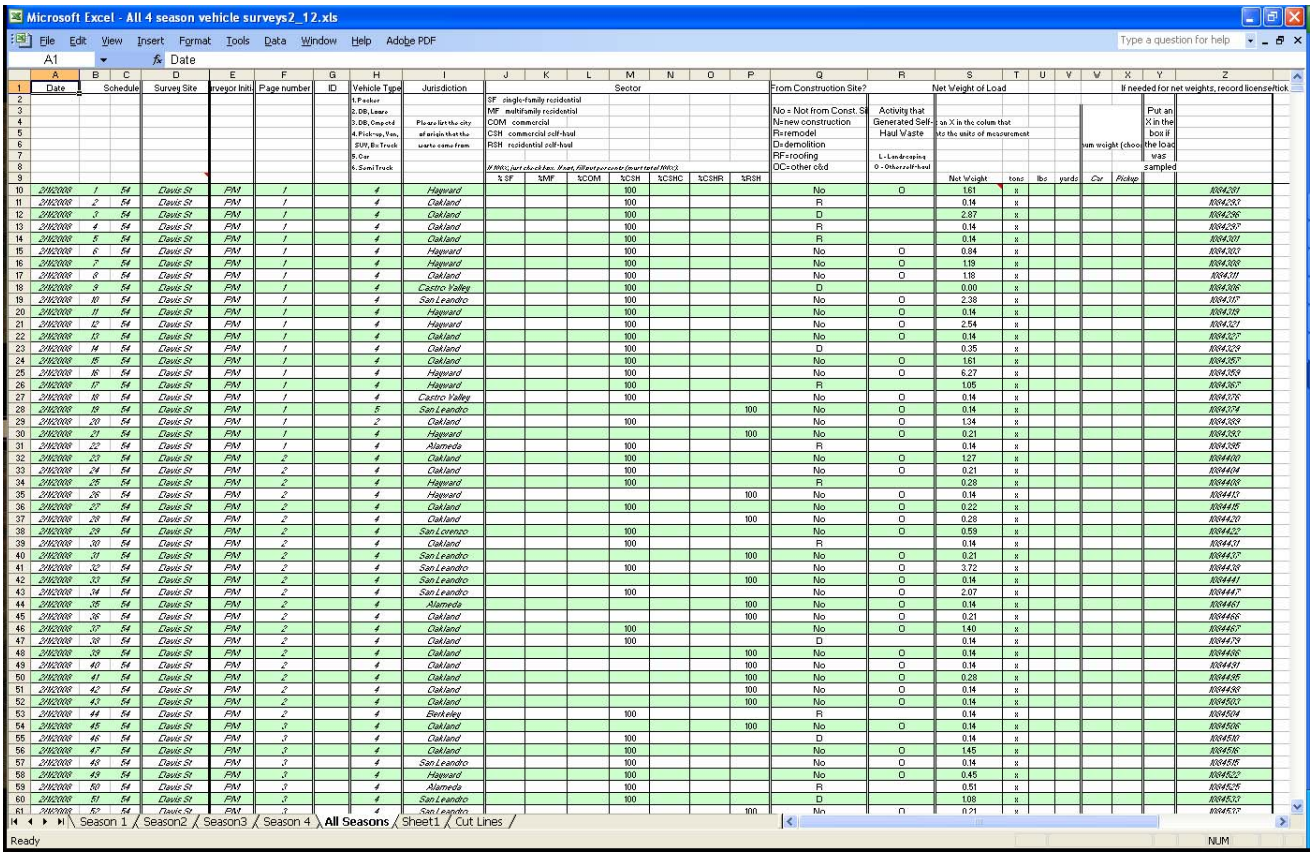
Name of facility delivering residuals	**Type of facility if known** (SS = single stream, MS – multi-stream, C&D, mixed waste/dirty MRF)	**Annual amount tons (preferred) or cu yd**

Do you have any other comments?

Snapshot of Waste Composition Data Entry Database



Snapshot of Vehicle Survey Data Entry Spreadsheet

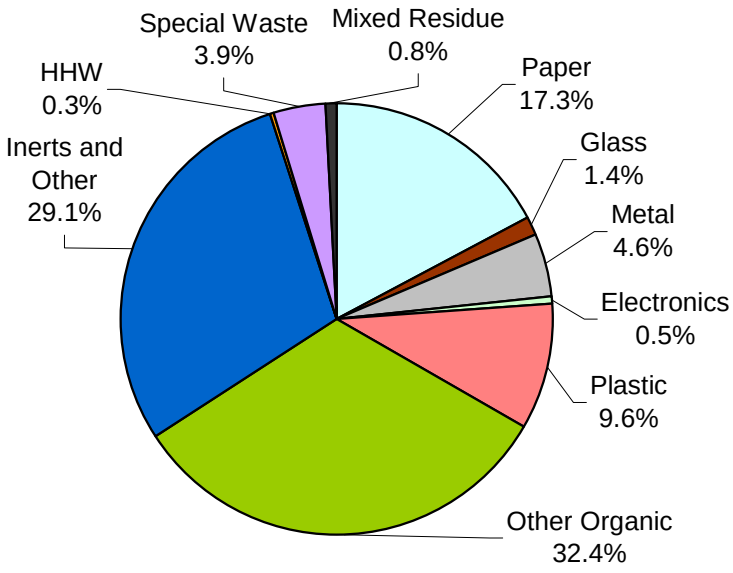


Appendix D: Expanded Statewide Waste Characterization Tables

This Appendix contains waste composition tables using the expanded list of 85 detailed *material types*. Definitions of the types can be found in Appendix B: List and Definitions of Material Types.

Overall Disposed Waste Stream

Figure 39: Overview of California's Overall Disposed Waste Stream



Material Class	Est. Percent
Paper	17.3%
Glass	1.4%
Metal	4.6%
Electronics	0.5%
Plastic	9.6%
Other Organic	32.4%
Inerts and Other	29.1%
HHW	0.3%
Special Waste	3.9%
Mixed Residue	0.8%
Total	**100%**

Numbers may not total exactly due to rounding.

Table 49: Ten Most Prevalent Material Types in California's Overall Disposed Waste Stream Using Expanded Material Types

Material	Est. Percent	Cum. Percent	Est. Tons
Food	15.5%	15.5%	6,158,120
Other Wood Waste	6.4%	21.9%	2,551,044
Remainder/Composite Inerts and Other	5.5%	27.4%	2,175,322
Uncoated Corrugated Cardboard	4.8%	32.2%	1,905,897
All Other Remainder/Composite Paper	4.5%	36.7%	1,796,617
Remainder/Composite Organic	4.3%	41.1%	1,719,743
Leaves and Grass	3.8%	44.9%	1,512,832
Bulky Items	3.5%	48.4%	1,393,091
Carpet	3.2%	51.6%	1,285,473
Rock, Soil and Fines	3.2%	54.8%	1,259,308
Total	**54.8%**		**21,757,447**

Any differences between *cumulative percent* figures and the sum of *estimated percent* figures are due to rounding.

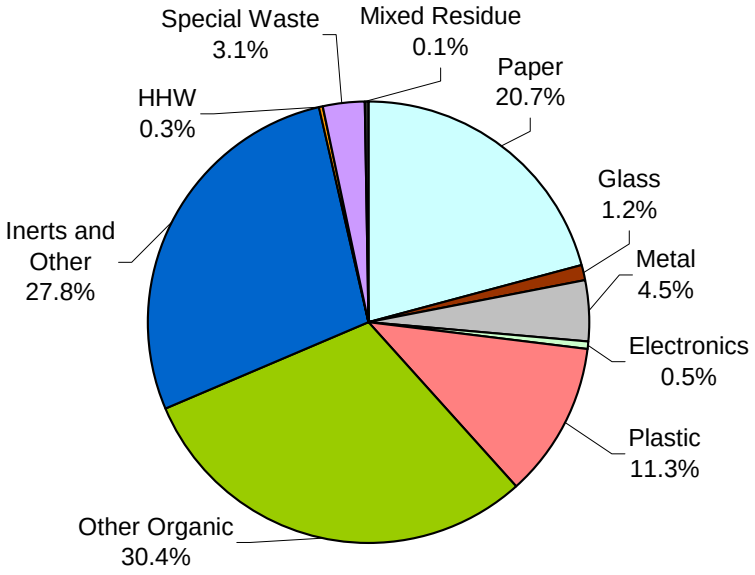
Table 50: Composition of California's Overall Disposed Waste Stream Using Expanded Material Types

Material	Est. Percent	+ / -	Est. Tons	Material	Est. Percent	+ / -	Est. Tons
Paper	**17.3%**		**6,859,121**	**Other Organic**	**32.4%**		**12,888,039**
Uncoated Corrugated Cardboard	4.8%	1.4%	1,905,897	Food	15.5%	1.9%	6,158,120
Paper Bags	0.4%	0.1%	155,848	Leaves and Grass	3.8%	0.7%	1,512,832
Newspaper	1.3%	0.4%	499,960	Prunings and Trimmings	2.7%	1.5%	1,058,854
White Ledger Paper	0.7%	0.3%	259,151	Branches and Stumps	0.6%	0.4%	245,830
Other Office Paper	1.2%	0.6%	472,147	Manures	0.1%	0.1%	20,373
Magazines and Catalogs	0.7%	0.2%	283,069	Textiles	2.2%	0.3%	886,814
Phone Books and Directories	0.1%	0.0%	24,149	Carpet	3.2%	2.0%	1,285,473
Other Miscellaneous Paper-Non-food Packaging	0.2%	0.0%	86,591	Remainder/Composite Organic	4.3%	0.5%	1,719,743
All Other Miscellaneous Paper	2.8%	0.6%	1,115,763				
Remainder/Composite Paper-Non-food Packaging	0.7%	0.2%	259,929	**Inerts and Other**	**29.1%**		**11,577,768**
All Other Remainder/Composite Paper	4.5%	1.1%	1,796,617	Concrete	1.2%	0.4%	483,367
				Asphalt Paving	0.3%	0.4%	129,834
Glass	**1.4%**		**565,844**	Asphalt Composition Shingles	1.6%	1.3%	637,912
Clear Glass Bottles and Containers	0.5%	0.1%	196,093	Roofing Tar Paper/Felt	0.3%	0.1%	100,648
Green Glass Bottles and Containers	0.2%	0.1%	79,491	Roofing Mastic	0.0%	0.1%	18,559
Brown Glass Bottles and Containers	0.3%	0.1%	108,953	Built-up Roofing	0.3%	0.5%	108,162
Other Colored Glass Bottles and Containers	0.1%	0.0%	40,570	Other Asphalt Roofing Material	0.6%	0.4%	256,664
Flat Glass	0.1%	0.1%	33,899	Clean Dimensional Lumber	3.0%	0.9%	1,184,375
Remainder/Composite Glass	0.3%	0.1%	106,838	Clean Engineered Wood	2.7%	0.8%	1,054,198
				Clean Pallets and Crates	2.5%	0.9%	975,866
				Other Wood Waste	6.4%	1.6%	2,551,044
Metal	**4.6%**		**1,809,684**	Clean Gypsum Board	1.1%	0.7%	449,097
Tin/Steel Cans	0.6%	0.2%	236,405	Painted/Demolition Gypsum Board	0.5%	0.2%	193,414
Major Appliances	0.0%	0.1%	17,120	Rock, Soil and Fines	3.2%	1.1%	1,259,308
Used Oil Filters	0.0%	0.0%	3,610	Remainder/Composite Inerts and Other	5.5%	1.3%	2,175,322
Other Ferrous	2.0%	0.4%	801,704				
Aluminum Cans	0.1%	0.0%	47,829	**Household Hazardous Waste (HHW)**	**0.3%**		**120,752**
Other Non-Ferrous	0.2%	0.1%	84,268	Paint	0.1%	0.1%	48,025
Remainder/Composite Metal	1.6%	0.5%	618,747	Vehicle & Equipment Fluids	0.0%	0.0%	6,424
				Used Oil	0.0%	0.0%	3,348
Electronics	**0.5%**		**216,297**	Lead-acid (automotive) Batteries	0.0%	0.0%	5,728
Brown Goods	0.2%	0.1%	76,725	Other Batteries	0.0%	0.0%	13,353
Computer-related Electronics - Large	0.1%	0.1%	26,357	Sharps	0.0%	0.0%	1,009
Computer-related Electronics - Small	0.0%	0.0%	6,574	Pharmaceuticals	0.0%	0.0%	5,887
Other Small Consumer Electronics	0.1%	0.0%	34,588	Fluorescent Lights/Other Mercury-containing Items	0.0%	0.0%	1,057
Video Display Devices	0.2%	0.1%	72,053	Remainder/Composite Household Hazardous	0.1%	0.1%	35,920
Plastic	**9.6%**		**3,807,952**	**Special Waste**	**3.9%**		**1,546,470**
PETE Water Bottles	0.1%	0.0%	51,706	Ash	0.1%	0.1%	40,736
PETE Sealed Containers	0.0%	0.0%	18,477	Treated Medical Waste	0.0%	0.0%	0
Other PETE Containers	0.3%	0.1%	129,460	Bulky Items	3.5%	1.2%	1,393,091
PLA Water Bottles	0.0%	0.0%	0	Vehicle and Truck Tires	0.1%	0.1%	23,627
HDPE Containers	0.4%	0.1%	157,779	Other Tires	0.1%	0.1%	36,553
#3-#7 Sealed Containers	0.0%	0.0%	18,127	Remainder/Composite Special Waste	0.1%	0.1%	52,463
#3-#7 Other Containers	0.4%	0.1%	144,881				
Plastic Trash Bags	0.9%	0.1%	361,997	**Mixed Residue**	**0.8%**		**330,891**
Plastic Grocery and Other Merchandise Bags	0.3%	0.0%	123,405	Mixed Residue	0.8%	0.2%	330,891
Non-Bag Commercial and Industrial Packaging Film	0.5%	0.2%	194,863				
Film Products	0.3%	0.2%	113,566				
Food Contact Film Packaging	0.4%	0.2%	154,250				
Other Film	1.0%	0.2%	399,752				
HDPE Buckets	0.2%	0.1%	79,108				
#3-#7 Buckets	0.0%	0.0%	504				
Durable Plastic Items	1.9%	0.4%	755,357	**Totals**	**100.0%**		**39,722,818**
Remainder/Composite Plastic	2.8%	0.7%	1,104,719	**Sample Count**	**751**		

Confidence intervals calculated at the 90% confidence level. Percentages for material types may not total 100% due to rounding.

Commercial Waste

Figure 40: Overview of Commercial Disposed Waste



Material Class	Est. Percent
Paper	20.7%
Glass	1.2%
Metal	4.5%
Electronics	0.5%
Plastic	11.3%
Other Organic	30.4%
Inerts and Other	27.8%
HHW	0.3%
Special Waste	3.1%
Mixed Residue	0.1%
Total	**100%**

Numbers may not total exactly due to rounding.

Table 51: Ten Most Prevalent Material Types in Commercial Disposed Waste Using Expanded Material Types

Material	Est. Percent	Cum. Percent	Est. Tons
Food	15.4%	15.4%	3,032,805
Uncoated Corrugated Cardboard	7.2%	22.7%	1,423,530
Other Wood Waste	5.4%	28.1%	1,064,767
All Other Remainder/Composite Paper	5.3%	33.4%	1,046,361
Remainder/Composite Inerts and Other	5.1%	38.4%	994,839
Remainder/Composite Plastic	4.0%	42.4%	788,056
Clean Pallets and Crates	3.8%	46.2%	746,760
Clean Dimensional Lumber	3.7%	50.0%	730,278
Carpet	3.5%	53.5%	697,461
Prunings and Trimmings	3.3%	56.8%	658,051
Total	**56.8%**		**11,182,909**

Any differences between *cumulative percent* figures and the sum of *estimated percent* figures are due to rounding.

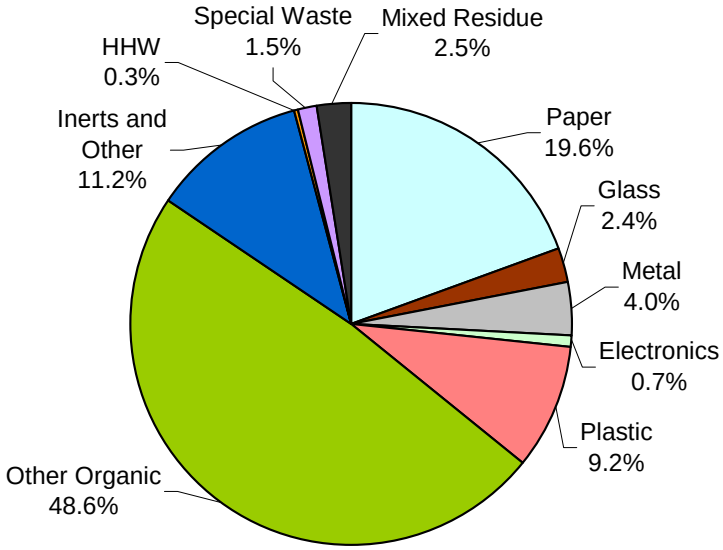
Table 52: Composition of Commercial Disposed Waste Using Expanded Material Types

Material	Est. Percent	+ / -	Est. Tons	Material	Est. Percent	+ / -	Est. Tons
Paper	**20.7%**		**4,072,311**	**Other Organic**	**30.4%**		**5,982,161**
Uncoated Corrugated Cardboard	7.2%	2.8%	1,423,530	Food	15.4%	3.7%	3,032,805
Paper Bags	0.4%	0.2%	71,741	Leaves and Grass	3.0%	1.0%	584,919
Newspaper	1.0%	0.4%	190,237	Prunings and Trimmings	3.3%	2.9%	658,051
White Ledger Paper	1.0%	0.6%	202,791	Branches and Stumps	0.5%	0.5%	100,513
Other Office Paper	1.3%	1.2%	249,456	Manures	0.0%	0.0%	149
Magazines and Catalogs	0.6%	0.3%	117,828	Textiles	1.4%	0.4%	279,563
Phone Books and Directories	0.1%	0.1%	11,220	Carpet	3.5%	3.6%	697,461
Other Miscellaneous Paper-Non-food Packaging	0.2%	0.1%	31,834	Remainder/Composite Organic	3.2%	0.8%	628,700
All Other Miscellaneous Paper	2.8%	1.0%	555,402				
Remainder/Composite Paper-Non-food Packaging	0.9%	0.4%	171,910	**Inerts and Other**	**27.8%**		**5,461,616**
All Other Remainder/Composite Paper	5.3%	2.1%	1,046,361	Concrete	0.9%	0.5%	167,312
				Asphalt Paving	0.0%	0.0%	4,786
Glass	**1.2%**		**245,547**	Asphalt Composition Shingles	1.5%	2.5%	304,841
Clear Glass Bottles and Containers	0.4%	0.2%	85,349	Roofing Tar Paper/Felt	0.2%	0.2%	34,811
Green Glass Bottles and Containers	0.2%	0.1%	29,764	Roofing Mastic	0.0%	0.0%	575
Brown Glass Bottles and Containers	0.3%	0.1%	51,366	Built-up Roofing	0.0%	0.0%	0
Other Colored Glass Bottles and Containers	0.0%	0.0%	7,798	Other Asphalt Roofing Material	0.6%	0.6%	115,474
Flat Glass	0.1%	0.1%	16,927	Clean Dimensional Lumber	3.7%	1.6%	730,278
Remainder/Composite Glass	0.3%	0.2%	54,343	Clean Engineered Wood	2.8%	1.2%	546,861
				Clean Pallets and Crates	3.8%	1.5%	746,760
				Other Wood Waste	5.4%	2.1%	1,064,767
Metal	**4.5%**		**880,362**	Clean Gypsum Board	1.1%	1.2%	216,249
Tin/Steel Cans	0.6%	0.3%	113,789	Painted/Demolition Gypsum Board	0.4%	0.3%	84,454
Major Appliances	0.1%	0.1%	17,120	Rock, Soil and Fines	2.3%	1.4%	449,609
Used Oil Filters	0.0%	0.0%	234	Remainder/Composite Inerts and Other	5.1%	2.0%	994,839
Other Ferrous	2.0%	0.6%	398,270				
Aluminum Cans	0.1%	0.0%	20,169	**Household Hazardous Waste (HHW)**	**0.3%**		**55,007**
Other Non-Ferrous	0.2%	0.1%	43,557	Paint	0.2%	0.2%	41,084
Remainder/Composite Metal	1.5%	0.8%	287,223	Vehicle & Equipment Fluids	0.0%	0.0%	1,076
				Used Oil	0.0%	0.0%	146
Electronics	**0.5%**		**96,710**	Lead-acid (automotive) Batteries	0.0%	0.0%	49
Brown Goods	0.2%	0.1%	38,583	Other Batteries	0.0%	0.0%	4,719
Computer-related Electronics - Large	0.0%	0.0%	2,363	Sharps	0.0%	0.0%	357
Computer-related Electronics - Small	0.0%	0.0%	323	Pharmaceuticals	0.0%	0.0%	722
Other Small Consumer Electronics	0.1%	0.0%	10,516	Fluorescent Lights/Other Mercury-containing Items	0.0%	0.0%	346
Video Display Devices	0.2%	0.3%	44,926	Remainder/Composite Household Hazardous	0.0%	0.0%	6,508
Plastic	**11.3%**		**2,232,684**	**Special Waste**	**3.1%**		**617,641**
PETE Water Bottles	0.1%	0.1%	24,552	Ash	0.2%	0.2%	32,314
PETE Sealed Containers	0.0%	0.0%	8,153	Treated Medical Waste	0.0%	0.0%	0
Other PETE Containers	0.3%	0.1%	56,471	Bulky Items	2.5%	1.7%	489,093
PLA Water Bottles	0.0%	0.0%	0	Vehicle and Truck Tires	0.1%	0.1%	23,452
HDPE Containers	0.4%	0.1%	74,261	Other Tires	0.2%	0.3%	32,248
#3-#7 Sealed Containers	0.1%	0.1%	11,121	Remainder/Composite Special Waste	0.2%	0.3%	40,534
#3-#7 Other Containers	0.4%	0.2%	73,179				
Plastic Trash Bags	1.2%	0.3%	233,075	**Mixed Residue**	**0.1%**		**28,507**
Plastic Grocery and Other Merchandise Bags	0.2%	0.1%	43,671	Mixed Residue	0.1%	0.1%	28,507
Non-Bag Commercial and Industrial Packaging Film	0.8%	0.4%	166,675				
Film Products	0.2%	0.1%	38,321				
Food Contact Film Packaging	0.5%	0.4%	98,185				
Other Film	1.2%	0.5%	231,259				
HDPE Buckets	0.3%	0.2%	61,678				
#3-#7 Buckets	0.0%	0.0%	261				
Durable Plastic Items	1.6%	0.5%	323,765	**Totals**	**100.0%**		**19,672,547**
Remainder/Composite Plastic	4.0%	1.4%	788,056	**Sample Count**	**250**		

Confidence intervals calculated at the 90% confidence level. Percentages for material types may not total 100% due to rounding.

Residential Waste

Figure 41: Overview of Overall Residential Disposed Waste



Material Class	Est. Percent
Paper	19.6%
Glass	2.4%
Metal	4.0%
Electronics	0.7%
Plastic	9.2%
Other Organic	48.6%
Inerts and Other	11.2%
HHW	0.3%
Special Waste	1.5%
Mixed Residue	2.5%
Total	**100%**

Numbers may not total exactly due to rounding.

Table 53: Ten Most Prevalent Material Types in Overall Residential Disposed Waste Using Expanded Material Types

Material	Est. Percent	Cum. Percent	Est. Tons
Food	25.4%	25.4%	3,034,040
Remainder/Composite Organic	8.4%	33.8%	1,002,937
Leaves and Grass	6.0%	39.8%	715,353
All Other Remainder/Composite Paper	5.4%	45.3%	648,650
Other Wood Waste	4.3%	49.6%	518,368
Textiles	4.2%	53.8%	506,658
All Other Miscellaneous Paper	4.1%	57.9%	486,397
Remainder/Composite Inerts and Other	2.8%	60.8%	339,929
Uncoated Corrugated Cardboard	2.7%	63.5%	323,058
Mixed Residue	2.5%	66.0%	297,515
Total	**66.0%**		**7,872,906**

Any differences between *cumulative percent* figures and the sum of *estimated percent* figures are due to rounding.

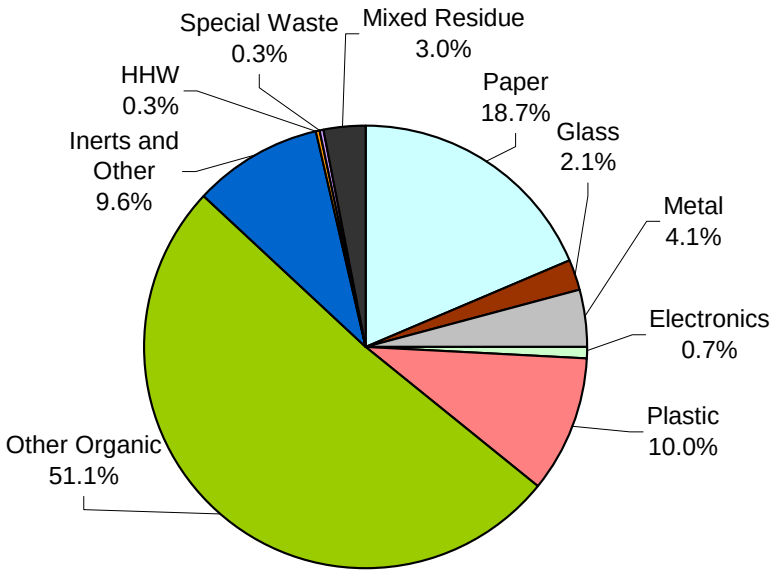
Table 54: Composition of Overall Residential Disposed Waste Using Expanded Material Types

Material	Est. Percent	+ / -	Est. Tons	Material	Est. Percent	+ / -	Est. Tons
Paper	**19.6%**		**2,337,272**	**Other Organic**	**48.6%**		**5,800,260**
Uncoated Corrugated Cardboard	2.7%	0.9%	323,058	Food	25.4%	2.2%	3,034,040
Paper Bags	0.5%	0.1%	59,705	Leaves and Grass	6.0%	1.3%	715,353
Newspaper	2.4%	0.9%	288,196	Prunings and Trimmings	1.9%	0.7%	225,375
White Ledger Paper	0.4%	0.1%	43,352	Branches and Stumps	0.1%	0.1%	17,032
Other Office Paper	1.7%	0.6%	203,895	Manures	0.2%	0.2%	20,224
Magazines and Catalogs	1.3%	0.2%	153,431	Textiles	4.2%	0.7%	506,658
Phone Books and Directories	0.1%	0.1%	11,929	Carpet	2.3%	2.2%	278,641
Other Miscellaneous Paper-Non-food Packaging	0.4%	0.1%	52,591	Remainder/Composite Organic	8.4%	1.1%	1,002,937
All Other Miscellaneous Paper	4.1%	1.1%	486,397				
Remainder/Composite Paper-Non-food Packaging	0.6%	0.1%	66,066	**Inerts and Other**	**11.2%**		**1,340,446**
All Other Remainder/Composite Paper	5.4%	1.3%	648,650	Concrete	0.5%	0.4%	63,281
				Asphalt Paving	0.0%	0.0%	544
Glass	**2.4%**		**282,933**	Asphalt Composition Shingles	0.0%	0.0%	2,372
Clear Glass Bottles and Containers	0.9%	0.2%	106,493	Roofing Tar Paper/Felt	0.1%	0.1%	8,381
Green Glass Bottles and Containers	0.4%	0.1%	48,187	Roofing Mastic	0.0%	0.0%	1,975
Brown Glass Bottles and Containers	0.5%	0.2%	55,403	Built-up Roofing	0.0%	0.0%	0
Other Colored Glass Bottles and Containers	0.2%	0.1%	29,633	Other Asphalt Roofing Material	0.1%	0.1%	9,282
Flat Glass	0.0%	0.0%	1,125	Clean Dimensional Lumber	0.6%	0.3%	74,475
Remainder/Composite Glass	0.4%	0.2%	42,093	Clean Engineered Wood	0.6%	0.4%	71,483
				Clean Pallets and Crates	1.1%	1.2%	130,571
				Other Wood Waste	4.3%	3.0%	518,368
Metal	**4.0%**		**478,431**	Clean Gypsum Board	0.1%	0.0%	7,013
Tin/Steel Cans	1.0%	0.2%	115,920	Painted/Demolition Gypsum Board	0.2%	0.1%	21,572
Major Appliances	0.0%	0.0%	0	Rock, Soil and Fines	0.8%	0.5%	91,199
Used Oil Filters	0.0%	0.0%	3,012	Remainder/Composite Inerts and Other	2.8%	1.8%	339,929
Other Ferrous	1.3%	0.4%	149,347				
Aluminum Cans	0.2%	0.1%	26,171	**Household Hazardous Waste (HHW)**	**0.3%**		**34,117**
Other Non-Ferrous	0.3%	0.1%	31,512	Paint	0.0%	0.0%	3,449
Remainder/Composite Metal	1.3%	0.4%	152,469	Vehicle & Equipment Fluids	0.0%	0.0%	4,252
				Used Oil	0.0%	0.0%	2,843
Electronics	**0.7%**		**86,262**	Lead-acid (automotive) Batteries	0.0%	0.1%	5,680
Brown Goods	0.2%	0.1%	28,421	Other Batteries	0.1%	0.0%	7,696
Computer-related Electronics - Large	0.1%	0.1%	6,702	Sharps	0.0%	0.0%	636
Computer-related Electronics - Small	0.0%	0.0%	4,655	Pharmaceuticals	0.0%	0.0%	4,988
Other Small Consumer Electronics	0.2%	0.1%	23,388	Fluorescent Lights/Other Mercury-containing Items	0.0%	0.0%	594
Video Display Devices	0.2%	0.2%	23,096	Remainder/Composite Household Hazardous	0.0%	0.0%	3,979
Plastic	**9.2%**		**1,103,485**	**Special Waste**	**1.5%**		**174,453**
PETE Water Bottles	0.2%	0.1%	25,767	Ash	0.1%	0.0%	6,960
PETE Sealed Containers	0.1%	0.0%	9,946	Treated Medical Waste	0.0%	0.0%	0
Other PETE Containers	0.6%	0.2%	69,458	Bulky Items	1.3%	1.0%	154,051
PLA Water Bottles	0.0%	0.0%	0	Vehicle and Truck Tires	0.0%	0.0%	7
HDPE Containers	0.7%	0.2%	78,846	Other Tires	0.0%	0.0%	2,563
#3-#7 Sealed Containers	0.1%	0.0%	6,485	Remainder/Composite Special Waste	0.1%	0.1%	10,873
#3-#7 Other Containers	0.6%	0.1%	67,944				
Plastic Trash Bags	0.9%	0.1%	109,464	**Mixed Residue**	**2.5%**		**297,515**
Plastic Grocery and Other Merchandise Bags	0.6%	0.1%	76,760	Mixed Residue	2.5%	0.8%	297,515
Non-Bag Commercial and Industrial Packaging Film	0.0%	0.0%	4,422				
Film Products	0.1%	0.1%	6,428				
Food Contact Film Packaging	0.5%	0.1%	54,793				
Other Film	1.3%	0.2%	152,978				
HDPE Buckets	0.1%	0.0%	7,661				
#3-#7 Buckets	0.0%	0.0%	65				
Durable Plastic Items	1.9%	0.5%	230,454	**Totals**	**100.0%**		**11,935,173**
Remainder/Composite Plastic	1.7%	0.2%	202,017	**Sample Count**	**251**		

Confidence intervals calculated at the 90% confidence level. Percentages for material types may not total 100% due to rounding.

Single-Family Residential Waste

Figure 42: Overview of Single-Family Residential Disposed Waste



Material Class	Est. Percent
Paper	18.7%
Glass	2.1%
Metal	4.1%
Electronics	0.7%
Plastic	10.0%
Other Organic	51.1%
Inerts and Other	9.6%
HHW	0.3%
Special Waste	0.3%
Mixed Residue	3.0%
Total	**100%**

Numbers may not total exactly due to rounding.

Table 55: Ten Most Prevalent Material Types in Single-Family Residential Disposed Waste Using Expanded Material Types

Material	Est. Percent	Cum. Percent	Est. Tons
Food	26.5%	26.5%	2,277,194
Remainder/Composite Organic	8.3%	34.8%	708,770
Leaves and Grass	7.5%	42.3%	646,018
All Other Remainder/Composite Paper	5.9%	48.2%	505,554
Textiles	4.5%	52.7%	382,018
All Other Miscellaneous Paper	4.0%	56.6%	339,929
Mixed Residue	3.0%	59.6%	259,331
Other Wood Waste	2.9%	62.5%	250,240
Prunings and Trimmings	2.5%	65.1%	218,759
Durable Plastic Items	2.4%	67.5%	206,349
Total	**67.5%**		**5,794,161**

Any differences between *cumulative percent* figures and the sum of *estimated percent* figures are due to rounding.

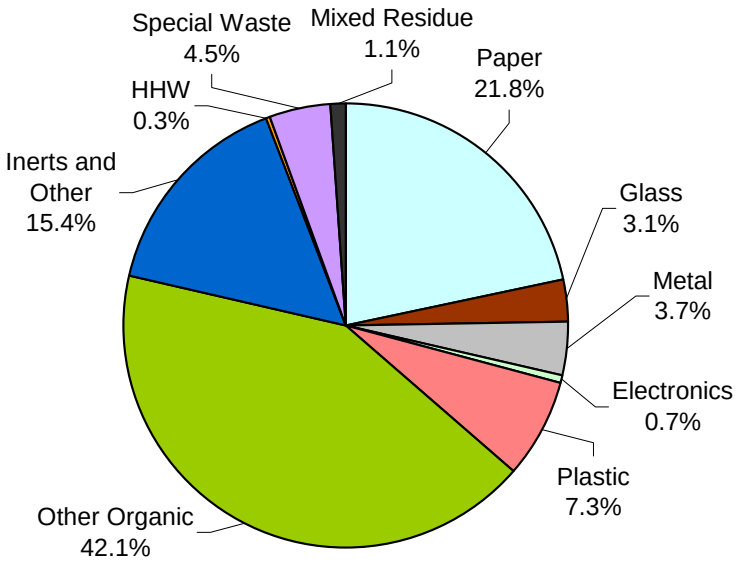
Table 56: Composition of Single-Family Residential Disposed Waste Using Expanded Material Types

Material	Est. Percent	+ / -	Est. Tons	Material	Est. Percent	+ / -	Est. Tons
Paper	**18.7%**		**1,608,183**	**Other Organic**	**51.1%**		**4,389,119**
Uncoated Corrugated Cardboard	2.1%	0.5%	176,011	Food	26.5%	2.2%	2,277,194
Paper Bags	0.5%	0.1%	42,817	Leaves and Grass	7.5%	1.7%	646,018
Newspaper	2.2%	0.6%	188,462	Prunings and Trimmings	2.5%	1.0%	218,759
White Ledger Paper	0.4%	0.1%	30,485	Branches and Stumps	0.2%	0.2%	17,032
Other Office Paper	1.4%	0.4%	118,662	Manures	0.2%	0.3%	20,224
Magazines and Catalogs	1.3%	0.2%	112,805	Textiles	4.5%	0.7%	382,018
Phone Books and Directories	0.1%	0.1%	10,228	Carpet	1.4%	0.8%	119,105
Other Miscellaneous Paper-Non-food Packaging	0.4%	0.1%	32,051	Remainder/Composite Organic	8.3%	0.9%	708,770
All Other Miscellaneous Paper	4.0%	0.9%	339,929				
Remainder/Composite Paper-Non-food Packaging	0.6%	0.1%	51,181	**Inerts and Other**	**9.6%**		**823,269**
All Other Remainder/Composite Paper	5.9%	1.3%	505,554	Concrete	0.7%	0.5%	63,228
				Asphalt Paving	0.0%	0.0%	544
Glass	**2.1%**		**179,435**	Asphalt Composition Shingles	0.0%	0.0%	2,372
Clear Glass Bottles and Containers	0.7%	0.1%	63,908	Roofing Tar Paper/Felt	0.1%	0.1%	8,316
Green Glass Bottles and Containers	0.4%	0.1%	30,567	Roofing Mastic	0.0%	0.0%	1,975
Brown Glass Bottles and Containers	0.4%	0.1%	32,855	Built-up Roofing	0.0%	0.0%	0
Other Colored Glass Bottles and Containers	0.2%	0.0%	15,985	Other Asphalt Roofing Material	0.1%	0.1%	9,282
Flat Glass	0.0%	0.0%	542	Clean Dimensional Lumber	0.6%	0.3%	51,812
Remainder/Composite Glass	0.4%	0.2%	35,578	Clean Engineered Wood	0.8%	0.6%	70,611
				Clean Pallets and Crates	0.8%	1.1%	67,213
				Other Wood Waste	2.9%	1.6%	250,240
Metal	**4.1%**		**355,542**	Clean Gypsum Board	0.1%	0.0%	5,710
Tin/Steel Cans	1.0%	0.2%	85,059	Painted/Demolition Gypsum Board	0.2%	0.2%	21,360
Major Appliances	0.0%	0.0%	0	Rock, Soil and Fines	1.1%	0.8%	90,658
Used Oil Filters	0.0%	0.0%	3,010	Remainder/Composite Inerts and Other	2.1%	1.1%	179,948
Other Ferrous	1.3%	0.4%	111,328				
Aluminum Cans	0.3%	0.1%	21,610	**Household Hazardous Waste (HHW)**	**0.3%**		**23,304**
Other Non-Ferrous	0.3%	0.1%	25,401	Paint	0.0%	0.0%	3,137
Remainder/Composite Metal	1.3%	0.4%	109,134	Vehicle & Equipment Fluids	0.0%	0.0%	2,217
				Used Oil	0.0%	0.0%	2,843
Electronics	**0.7%**		**62,806**	Lead-acid (automotive) Batteries	0.1%	0.1%	5,680
Brown Goods	0.3%	0.2%	23,037	Other Batteries	0.1%	0.0%	5,435
Computer-related Electronics - Large	0.1%	0.1%	5,652	Sharps	0.0%	0.0%	234
Computer-related Electronics - Small	0.1%	0.0%	4,653	Pharmaceuticals	0.0%	0.0%	2,183
Other Small Consumer Electronics	0.2%	0.2%	19,995	Fluorescent Lights/Other Mercury-containing Items	0.0%	0.0%	452
Video Display Devices	0.1%	0.2%	9,469	Remainder/Composite Household Hazardous	0.0%	0.0%	1,124
Plastic	**10.0%**		**858,442**	**Special Waste**	**0.3%**		**24,313**
PETE Water Bottles	0.2%	0.1%	17,625	Ash	0.0%	0.0%	4,034
PETE Sealed Containers	0.1%	0.0%	5,455	Treated Medical Waste	0.0%	0.0%	0
Other PETE Containers	0.5%	0.1%	47,167	Bulky Items	0.1%	0.1%	7,904
PLA Water Bottles	0.0%	0.0%	0	Vehicle and Truck Tires	0.0%	0.0%	7
HDPE Containers	0.6%	0.1%	47,659	Other Tires	0.0%	0.0%	2,563
#3-#7 Sealed Containers	0.1%	0.0%	5,814	Remainder/Composite Special Waste	0.1%	0.1%	9,805
#3-#7 Other Containers	0.6%	0.1%	47,678				
Plastic Trash Bags	1.0%	0.1%	84,372	**Mixed Residue**	**3.0%**		**259,331**
Plastic Grocery and Other Merchandise Bags	0.7%	0.1%	58,641	Mixed Residue	3.0%	0.9%	259,331
Non-Bag Commercial and Industrial Packaging Film	0.0%	0.0%	4,016				
Film Products	0.0%	0.0%	1,687				
Food Contact Film Packaging	0.5%	0.0%	39,483				
Other Film	1.5%	0.3%	127,581				
HDPE Buckets	0.1%	0.0%	5,547				
#3-#7 Buckets	0.0%	0.0%	65				
Durable Plastic Items	2.4%	0.6%	206,349	**Totals**	**100.0%**		**8,583,746**
Remainder/Composite Plastic	1.9%	0.2%	159,302	**Sample Count**	**201**		

Confidence intervals calculated at the 90% confidence level. Percentages for material types may not total 100% due to rounding.

Multifamily Residential Waste

Figure 43: Overview of Multifamily Residential Disposed Waste



Material Class	Est. Percent
Paper	21.8%
Glass	3.1%
Metal	3.7%
Electronics	0.7%
Plastic	7.3%
Other Organic	42.1%
Inerts and Other	15.4%
HHW	0.3%
Special Waste	4.5%
Mixed Residue	1.1%
Total	**100%**

Numbers may not total exactly due to rounding.

Table 57: Ten Most Prevalent Material Types in Multifamily Residential Disposed Waste Using Expanded Material Types

Material	Est. Percent	Cum. Percent	Est. Tons
Food	22.6%	22.6%	756,846
Remainder/Composite Organic	8.8%	31.4%	294,167
Other Wood Waste	8.0%	39.4%	268,129
Remainder/Composite Inerts and Other	4.8%	44.1%	159,982
Carpet	4.8%	48.9%	159,536
Uncoated Corrugated Cardboard	4.4%	53.3%	147,048
All Other Miscellaneous Paper	4.4%	57.7%	146,468
Bulky Items	4.4%	62.0%	146,147
All Other Remainder/Composite Paper	4.3%	66.3%	143,097
Textiles	3.7%	70.0%	124,641
Total	**70.0%**		**2,346,059**

Any differences between *cumulative percent* figures and the sum of *estimated percent* figures are due to rounding.

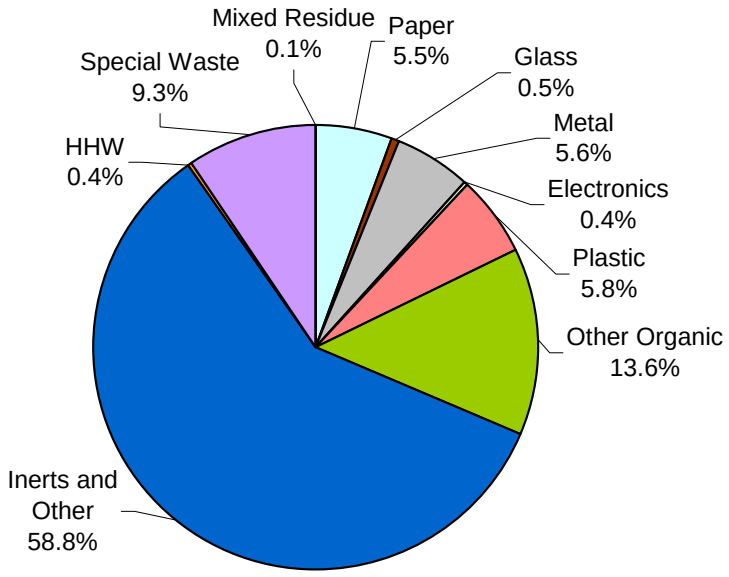
Table 58: Composition of Multifamily Residential Disposed Waste Using Expanded Material Types

Material	Est. Percent	+ / -	Est. Tons	Material	Est. Percent	+ / -	Est. Tons
Paper	**21.8%**		**729,089**	**Other Organic**	**42.1%**		**1,411,140**
Uncoated Corrugated Cardboard	4.4%	3.0%	147,048	Food	22.6%	5.5%	756,846
Paper Bags	0.5%	0.3%	16,887	Leaves and Grass	2.1%	1.8%	69,336
Newspaper	3.0%	2.8%	99,735	Prunings and Trimmings	0.2%	0.1%	6,616
White Ledger Paper	0.4%	0.3%	12,867	Branches and Stumps	0.0%	0.0%	0
Other Office Paper	2.5%	2.1%	85,234	Manures	0.0%	0.0%	0
Magazines and Catalogs	1.2%	0.5%	40,627	Textiles	3.7%	1.7%	124,641
Phone Books and Directories	0.1%	0.1%	1,702	Carpet	4.8%	7.5%	159,536
Other Miscellaneous Paper-Non-food Packaging	0.6%	0.2%	20,541	Remainder/Composite Organic	8.8%	3.0%	294,167
All Other Miscellaneous Paper	4.4%	3.0%	146,468				
Remainder/Composite Paper-Non-food Packaging	0.4%	0.2%	14,885	**Inerts and Other**	**15.4%**		**517,176**
All Other Remainder/Composite Paper	4.3%	3.0%	143,097	Concrete	0.0%	0.0%	53
				Asphalt Paving	0.0%	0.0%	0
Glass	**3.1%**		**103,497**	Asphalt Composition Shingles	0.0%	0.0%	0
Clear Glass Bottles and Containers	1.3%	0.6%	42,585	Roofing Tar Paper/Felt	0.0%	0.0%	65
Green Glass Bottles and Containers	0.5%	0.4%	17,620	Roofing Mastic	0.0%	0.0%	0
Brown Glass Bottles and Containers	0.7%	0.5%	22,548	Built-up Roofing	0.0%	0.0%	0
Other Colored Glass Bottles and Containers	0.4%	0.3%	13,648	Other Asphalt Roofing Material	0.0%	0.0%	0
Flat Glass	0.0%	0.0%	582	Clean Dimensional Lumber	0.7%	0.9%	22,663
Remainder/Composite Glass	0.2%	0.1%	6,514	Clean Engineered Wood	0.0%	0.0%	872
				Clean Pallets and Crates	1.9%	3.1%	63,358
				Other Wood Waste	8.0%	9.7%	268,129
Metal	**3.7%**		**122,889**	Clean Gypsum Board	0.0%	0.1%	1,303
Tin/Steel Cans	0.9%	0.7%	30,862	Painted/Demolition Gypsum Board	0.0%	0.0%	213
Major Appliances	0.0%	0.0%	0	Rock, Soil and Fines	0.0%	0.0%	541
Used Oil Filters	0.0%	0.0%	2	Remainder/Composite Inerts and Other	4.8%	5.9%	159,982
Other Ferrous	1.1%	0.9%	38,019				
Aluminum Cans	0.1%	0.1%	4,561	**Household Hazardous Waste (HHW)**	**0.3%**		**10,813**
Other Non-Ferrous	0.2%	0.1%	6,111	Paint	0.0%	0.0%	312
Remainder/Composite Metal	1.3%	0.9%	43,335	Vehicle & Equipment Fluids	0.1%	0.1%	2,036
				Used Oil	0.0%	0.0%	0
Electronics	**0.7%**		**23,456**	Lead-acid (automotive) Batteries	0.0%	0.0%	0
Brown Goods	0.2%	0.2%	5,384	Other Batteries	0.1%	0.1%	2,261
Computer-related Electronics - Large	0.0%	0.1%	1,051	Sharps	0.0%	0.0%	402
Computer-related Electronics - Small	0.0%	0.0%	2	Pharmaceuticals	0.1%	0.1%	2,806
Other Small Consumer Electronics	0.1%	0.1%	3,393	Fluorescent Lights/Other Mercury-containing Items	0.0%	0.0%	142
Video Display Devices	0.4%	0.6%	13,626	Remainder/Composite Household Hazardous	0.1%	0.1%	2,855
Plastic	**7.3%**		**245,043**	**Special Waste**	**4.5%**		**150,140**
PETE Water Bottles	0.2%	0.2%	8,141	Ash	0.1%	0.1%	2,926
PETE Sealed Containers	0.1%	0.2%	4,490	Treated Medical Waste	0.0%	0.0%	0
Other PETE Containers	0.7%	0.5%	22,291	Bulky Items	4.4%	3.6%	146,147
PLA Water Bottles	0.0%	0.0%	0	Vehicle and Truck Tires	0.0%	0.0%	0
HDPE Containers	0.9%	0.7%	31,186	Other Tires	0.0%	0.0%	0
#3-#7 Sealed Containers	0.0%	0.0%	672	Remainder/Composite Special Waste	0.0%	0.1%	1,067
#3-#7 Other Containers	0.6%	0.4%	20,265				
Plastic Trash Bags	0.7%	0.1%	25,092	**Mixed Residue**	**1.1%**		**38,183**
Plastic Grocery and Other Merchandise Bags	0.5%	0.2%	18,119	Mixed Residue	1.1%	1.4%	38,183
Non-Bag Commercial and Industrial Packaging Film	0.0%	0.0%	406				
Film Products	0.1%	0.2%	4,741				
Food Contact Film Packaging	0.5%	0.2%	15,310				
Other Film	0.8%	0.3%	25,396				
HDPE Buckets	0.1%	0.1%	2,114				
#3-#7 Buckets	0.0%	0.0%	0				
Durable Plastic Items	0.7%	0.2%	24,105	**Totals**	**100.0%**		**3,351,428**
Remainder/Composite Plastic	1.3%	0.3%	42,715	**Sample Count**	**50**		

Confidence intervals calculated at the 90% confidence level. Percentages for material types may not total 100% due to rounding.

Self-hauled Waste

Figure 44: Overview of Overall Self-hauled Disposed Waste



Material Class	Est. Percent
Paper	5.5%
Glass	0.5%
Metal	5.6%
Electronics	0.4%
Plastic	5.8%
Other Organic	13.6%
Inerts and Other	58.8%
HHW	0.4%
Special Waste	9.3%
Mixed Residue	0.1%
Total	**100%**

Numbers may not total exactly due to rounding.

Table 59: Ten Most Prevalent Material Types in Overall Self-hauled Disposed Waste Using Expanded Material Types

Material	Est. Percent	Cum. Percent	Est. Tons
Other Wood Waste	11.9%	11.9%	967,909
Remainder/Composite Inerts and Other	10.4%	22.3%	840,554
Bulky Items	9.2%	31.5%	749,947
Rock, Soil and Fines	8.9%	40.4%	718,500
Clean Engineered Wood	5.4%	45.8%	435,853
Clean Dimensional Lumber	4.7%	50.4%	379,622
Asphalt Composition Shingles	4.1%	54.5%	330,698
Carpet	3.8%	58.3%	309,371
Other Ferrous	3.1%	61.4%	254,087
Concrete	3.1%	64.6%	252,774
Total	**64.6%**		**5,239,313**

Any differences between *cumulative percent* figures and the sum of *estimated percent* figures are due to rounding.

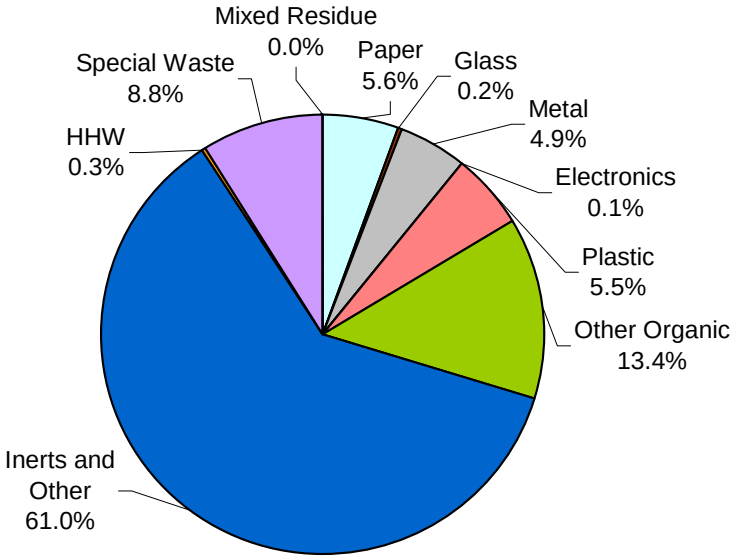
Table 60: Composition of Overall Self-hauled Disposed Waste Using Expanded Material Types

Material	Est. Percent	+ / -	Est. Tons	Material	Est. Percent	+ / -	Est. Tons
Paper	**5.5%**		**449,539**	**Other Organic**	**13.6%**		**1,105,618**
Uncoated Corrugated Cardboard	2.0%	0.8%	159,309	Food	1.1%	0.5%	91,275
Paper Bags	0.3%	0.2%	24,402	Leaves and Grass	2.6%	1.1%	212,560
Newspaper	0.3%	0.3%	21,526	Prunings and Trimmings	2.2%	1.2%	175,428
White Ledger Paper	0.2%	0.2%	13,008	Branches and Stumps	1.6%	1.4%	128,285
Other Office Paper	0.2%	0.3%	18,795	Manures	0.0%	0.0%	0
Magazines and Catalogs	0.1%	0.1%	11,810	Textiles	1.2%	0.5%	100,593
Phone Books and Directories	0.0%	0.0%	999	Carpet	3.8%	2.4%	309,371
Other Miscellaneous Paper-Non-food Packaging	0.0%	0.0%	2,165	Remainder/Composite Organic	1.1%	0.4%	88,106
All Other Miscellaneous Paper	0.9%	0.9%	73,965				
Remainder/Composite Paper-Non-food Packaging	0.3%	0.3%	21,953	**Inerts and Other**	**58.8%**		**4,775,706**
All Other Remainder/Composite Paper	1.3%	0.8%	101,605	Concrete	3.1%	1.5%	252,774
				Asphalt Paving	1.5%	2.0%	124,504
Glass	**0.5%**		**37,364**	Asphalt Composition Shingles	4.1%	2.4%	330,698
Clear Glass Bottles and Containers	0.1%	0.0%	4,251	Roofing Tar Paper/Felt	0.7%	0.3%	57,457
Green Glass Bottles and Containers	0.0%	0.0%	1,540	Roofing Mastic	0.2%	0.3%	16,009
Brown Glass Bottles and Containers	0.0%	0.0%	2,184	Built-up Roofing	1.3%	2.2%	108,162
Other Colored Glass Bottles and Containers	0.0%	0.1%	3,139	Other Asphalt Roofing Material	1.6%	1.1%	131,908
Flat Glass	0.2%	0.2%	15,848	Clean Dimensional Lumber	4.7%	2.4%	379,622
Remainder/Composite Glass	0.1%	0.1%	10,403	Clean Engineered Wood	5.4%	2.6%	435,853
				Clean Pallets and Crates	1.2%	0.8%	98,534
				Other Wood Waste	11.9%	4.0%	967,909
Metal	**5.6%**		**450,890**	Clean Gypsum Board	2.8%	1.7%	225,835
Tin/Steel Cans	0.1%	0.0%	6,696	Painted/Demolition Gypsum Board	1.1%	0.7%	87,388
Major Appliances	0.0%	0.0%	0	Rock, Soil and Fines	8.9%	4.2%	718,500
Used Oil Filters	0.0%	0.0%	364	Remainder/Composite Inerts and Other	10.4%	3.7%	840,554
Other Ferrous	3.1%	1.0%	254,087				
Aluminum Cans	0.0%	0.0%	1,489	**Household Hazardous Waste (HHW)**	**0.4%**		**31,628**
Other Non-Ferrous	0.1%	0.1%	9,199	Paint	0.0%	0.0%	3,492
Remainder/Composite Metal	2.2%	1.2%	179,056	Vehicle & Equipment Fluids	0.0%	0.0%	1,096
				Used Oil	0.0%	0.0%	359
Electronics	**0.4%**		**33,325**	Lead-acid (automotive) Batteries	0.0%	0.0%	0
Brown Goods	0.1%	0.1%	9,721	Other Batteries	0.0%	0.0%	938
Computer-related Electronics - Large	0.2%	0.4%	17,292	Sharps	0.0%	0.0%	17
Computer-related Electronics - Small	0.0%	0.0%	1,596	Pharmaceuticals	0.0%	0.0%	176
Other Small Consumer Electronics	0.0%	0.0%	685	Fluorescent Lights/Other Mercury-containing Items	0.0%	0.0%	118
Video Display Devices	0.0%	0.0%	4,031	Remainder/Composite Household Hazardous	0.3%	0.4%	25,433
Plastic	**5.8%**		**471,782**	**Special Waste**	**9.3%**		**754,376**
PETE Water Bottles	0.0%	0.0%	1,387	Ash	0.0%	0.0%	1,462
PETE Sealed Containers	0.0%	0.0%	378	Treated Medical Waste	0.0%	0.0%	0
Other PETE Containers	0.0%	0.0%	3,531	Bulky Items	9.2%	3.7%	749,947
PLA Water Bottles	0.0%	0.0%	0	Vehicle and Truck Tires	0.0%	0.0%	168
HDPE Containers	0.1%	0.0%	4,672	Other Tires	0.0%	0.0%	1,742
#3-#7 Sealed Containers	0.0%	0.0%	521	Remainder/Composite Special Waste	0.0%	0.0%	1,056
#3-#7 Other Containers	0.0%	0.0%	3,758				
Plastic Trash Bags	0.2%	0.1%	19,458	**Mixed Residue**	**0.1%**		**4,870**
Plastic Grocery and Other Merchandise Bags	0.0%	0.0%	2,974	Mixed Residue	0.1%	0.0%	4,870
Non-Bag Commercial and Industrial Packaging Film	0.3%	0.2%	23,767				
Film Products	0.8%	0.9%	68,817				
Food Contact Film Packaging	0.0%	0.0%	1,272				
Other Film	0.2%	0.1%	15,515				
HDPE Buckets	0.1%	0.1%	9,769				
#3-#7 Buckets	0.0%	0.0%	179				
Durable Plastic Items	2.5%	1.3%	201,138	**Totals**	**100.0%**		**8,115,098**
Remainder/Composite Plastic	1.4%	0.8%	114,646	**Sample Count**	**250**		

Confidence intervals calculated at the 90% confidence level. Percentages for material types may not total 100% due to rounding.

Commercial Self-hauled Waste

Figure 45: Overview of Commercial Self-hauled Disposed Waste



Material Class	Est. Percent
Paper	5.6%
Glass	0.2%
Metal	4.9%
Electronics	0.1%
Plastic	5.5%
Other Organic	13.4%
Inerts and Other	61.0%
HHW	0.3%
Special Waste	8.8%
Mixed Residue	0.0%
Total	**100%**

Numbers may not total exactly due to rounding.

Table 61: Ten Most Prevalent Material Types in Commercial Self-hauled Disposed Waste Using Expanded Material Types

Material	Est. Percent	Cum. Percent	Est. Tons
Other Wood Waste	11.5%	11.5%	782,719
Remainder/Composite Inerts and Other	10.9%	22.4%	742,415
Rock, Soil and Fines	10.2%	32.6%	694,103
Bulky Items	8.8%	41.3%	597,335
Clean Engineered Wood	6.0%	47.4%	411,763
Clean Dimensional Lumber	4.7%	52.0%	317,552
Asphalt Composition Shingles	4.6%	56.6%	313,053
Carpet	3.9%	60.6%	266,518
Clean Gypsum Board	3.2%	63.8%	218,158
Other Ferrous	3.0%	66.7%	201,107
Total	**66.7%**		**4,544,723**

Any differences between *cumulative percent* figures and the sum of *estimated percent* figures are due to rounding.

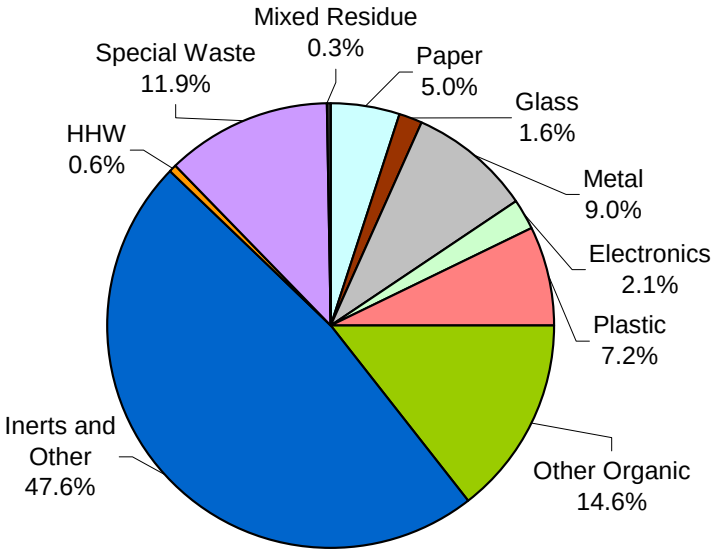
Table 62: Composition of Commercial Self-hauled Disposed Waste Using Expanded Material Types

Material	Est. Percent	+ / -	Est. Tons	Material	Est. Percent	+ / -	Est. Tons
Paper	**5.6%**		**384,854**	**Other Organic**	**13.4%**		**915,720**
Uncoated Corrugated Cardboard	2.0%	0.9%	134,247	Food	0.9%	0.5%	63,049
Paper Bags	0.3%	0.3%	22,558	Leaves and Grass	2.7%	1.3%	186,928
Newspaper	0.3%	0.3%	18,148	Prunings and Trimmings	2.3%	1.4%	155,697
White Ledger Paper	0.2%	0.2%	11,966	Branches and Stumps	1.8%	1.7%	120,016
Other Office Paper	0.2%	0.3%	16,265	Manures	0.0%	0.0%	0
Magazines and Catalogs	0.1%	0.1%	8,234	Textiles	0.9%	0.5%	63,784
Phone Books and Directories	0.0%	0.0%	0	Carpet	3.9%	2.8%	266,518
Other Miscellaneous Paper-Non-food Packaging	0.0%	0.0%	1,157	Remainder/Composite Organic	0.9%	0.4%	59,729
All Other Miscellaneous Paper	0.9%	1.0%	62,866				
Remainder/Composite Paper-Non-food Packaging	0.3%	0.3%	17,647	**Inerts and Other**	**61.0%**		**4,155,221**
All Other Remainder/Composite Paper	1.3%	0.9%	91,766	Concrete	2.1%	1.3%	145,871
				Asphalt Paving	1.5%	2.3%	102,909
Glass	**0.2%**		**16,107**	Asphalt Composition Shingles	4.6%	2.9%	313,053
Clear Glass Bottles and Containers	0.0%	0.0%	1,722	Roofing Tar Paper/Felt	0.8%	0.4%	56,980
Green Glass Bottles and Containers	0.0%	0.0%	1,172	Roofing Mastic	0.2%	0.3%	15,776
Brown Glass Bottles and Containers	0.0%	0.0%	679	Built-up Roofing	1.6%	2.6%	108,162
Other Colored Glass Bottles and Containers	0.0%	0.1%	2,766	Other Asphalt Roofing Material	1.9%	1.3%	131,761
Flat Glass	0.1%	0.1%	5,740	Clean Dimensional Lumber	4.7%	2.9%	317,552
Remainder/Composite Glass	0.1%	0.0%	4,027	Clean Engineered Wood	6.0%	3.1%	411,763
				Clean Pallets and Crates	1.1%	1.0%	74,889
				Other Wood Waste	11.5%	4.7%	782,719
Metal	**4.9%**		**333,090**	Clean Gypsum Board	3.2%	2.0%	218,158
Tin/Steel Cans	0.1%	0.0%	4,257	Painted/Demolition Gypsum Board	0.6%	0.4%	39,111
Major Appliances	0.0%	0.0%	0	Rock, Soil and Fines	10.2%	5.0%	694,103
Used Oil Filters	0.0%	0.0%	267	Remainder/Composite Inerts and Other	10.9%	4.3%	742,415
Other Ferrous	3.0%	1.1%	201,107				
Aluminum Cans	0.0%	0.0%	1,006	**Household Hazardous Waste (HHW)**	**0.3%**		**23,427**
Other Non-Ferrous	0.1%	0.1%	4,987	Paint	0.0%	0.0%	1,851
Remainder/Composite Metal	1.8%	1.3%	121,467	Vehicle & Equipment Fluids	0.0%	0.0%	684
				Used Oil	0.0%	0.0%	185
Electronics	**0.1%**		**6,259**	Lead-acid (automotive) Batteries	0.0%	0.0%	0
Brown Goods	0.0%	0.1%	2,496	Other Batteries	0.0%	0.0%	818
Computer-related Electronics - Large	0.0%	0.0%	0	Sharps	0.0%	0.0%	0
Computer-related Electronics - Small	0.0%	0.0%	1,589	Pharmaceuticals	0.0%	0.0%	157
Other Small Consumer Electronics	0.0%	0.0%	374	Fluorescent Lights/Other Mercury-containing Items	0.0%	0.0%	70
Video Display Devices	0.0%	0.0%	1,799	Remainder/Composite Household Hazardous	0.3%	0.4%	19,661
Plastic	**5.5%**		**378,044**	**Special Waste**	**8.8%**		**598,930**
PETE Water Bottles	0.0%	0.0%	1,089	Ash	0.0%	0.0%	965
PETE Sealed Containers	0.0%	0.0%	158	Treated Medical Waste	0.0%	0.0%	0
Other PETE Containers	0.0%	0.0%	1,921	Bulky Items	8.8%	4.3%	597,335
PLA Water Bottles	0.0%	0.0%	0	Vehicle and Truck Tires	0.0%	0.0%	0
HDPE Containers	0.0%	0.0%	2,757	Other Tires	0.0%	0.0%	629
#3-#7 Sealed Containers	0.0%	0.0%	326	Remainder/Composite Special Waste	0.0%	0.0%	0
#3-#7 Other Containers	0.0%	0.0%	1,180				
Plastic Trash Bags	0.3%	0.1%	17,042	**Mixed Residue**	**0.0%**		**812**
Plastic Grocery and Other Merchandise Bags	0.0%	0.0%	1,998	Mixed Residue	0.0%	0.0%	812
Non-Bag Commercial and Industrial Packaging Film	0.3%	0.2%	23,625				
Film Products	1.0%	1.0%	66,026				
Food Contact Film Packaging	0.0%	0.0%	791				
Other Film	0.1%	0.1%	9,240				
HDPE Buckets	0.1%	0.1%	5,722				
#3-#7 Buckets	0.0%	0.0%	156				
Durable Plastic Items	2.3%	1.5%	157,522	**Totals**	**100.0%**		**6,812,464**
Remainder/Composite Plastic	1.3%	1.0%	88,489	**Sample Count**	**139**		

Confidence intervals calculated at the 90% confidence level. Percentages for material types may not total 100% due to rounding.

Residential Self-hauled Waste

Figure 46: Overview of Residential Self-hauled Disposed Waste



Material Class	Est. Percent
Paper	5.0%
Glass	1.6%
Metal	9.0%
Electronics	2.1%
Plastic	7.2%
Other Organic	14.6%
Inerts and Other	47.6%
HHW	0.6%
Special Waste	11.9%
Mixed Residue	0.3%
Total	**100%**

Numbers may not total exactly due to rounding.

Table 63: Ten Most Prevalent Material Types in Residential Self-hauled Disposed Waste Using Expanded Material Types

Material	Est. Percent	Cum. Percent	Est. Tons
Other Wood Waste	14.2%	14.2%	185,190
Bulky Items	11.7%	25.9%	152,612
Concrete	8.2%	34.1%	106,903
Remainder/Composite Inerts and Other	7.5%	41.7%	98,139
Clean Dimensional Lumber	4.8%	46.4%	62,070
Remainder/Composite Metal	4.4%	50.9%	57,589
Other Ferrous	4.1%	54.9%	52,980
Painted/Demolition Gypsum Board	3.7%	58.6%	48,277
Durable Plastic Items	3.3%	62.0%	43,616
Carpet	3.3%	65.3%	42,853
Total	**65.3%**		**850,228**

Any differences between *cumulative percent* figures and the sum of *estimated percent* figures are due to rounding.

Table 64: Composition of Residential Self-hauled Disposed Waste Using Expanded Material Types

Material	Est. Percent	+ / -	Est. Tons	Material	Est. Percent	+ / -	Est. Tons
Paper	**5.0%**		**64,685**	**Other Organic**	**14.6%**		**189,898**
Uncoated Corrugated Cardboard	1.9%	0.9%	25,062	Food	2.2%	0.8%	28,226
Paper Bags	0.1%	0.1%	1,844	Leaves and Grass	2.0%	1.1%	25,632
Newspaper	0.3%	0.1%	3,378	Prunings and Trimmings	1.5%	1.6%	19,731
White Ledger Paper	0.1%	0.1%	1,042	Branches and Stumps	0.6%	0.8%	8,269
Other Office Paper	0.2%	0.1%	2,530	Manures	0.0%	0.0%	0
Magazines and Catalogs	0.3%	0.1%	3,576	Textiles	2.8%	1.2%	36,810
Phone Books and Directories	0.1%	0.1%	999	Carpet	3.3%	2.4%	42,853
Other Miscellaneous Paper-Non-food Packaging	0.1%	0.1%	1,009	Remainder/Composite Organic	2.2%	0.9%	28,377
All Other Miscellaneous Paper	0.9%	0.4%	11,099				
Remainder/Composite Paper-Non-food Packaging	0.3%	0.3%	4,306	**Inerts and Other**	**47.6%**		**620,485**
All Other Remainder/Composite Paper	0.8%	0.4%	9,839	Concrete	8.2%	6.0%	106,903
				Asphalt Paving	1.7%	2.5%	21,595
Glass	**1.6%**		**21,257**	Asphalt Composition Shingles	1.4%	1.6%	17,645
Clear Glass Bottles and Containers	0.2%	0.1%	2,529	Roofing Tar Paper/Felt	0.0%	0.1%	477
Green Glass Bottles and Containers	0.0%	0.0%	368	Roofing Mastic	0.0%	0.0%	233
Brown Glass Bottles and Containers	0.1%	0.1%	1,505	Built-up Roofing	0.0%	0.0%	0
Other Colored Glass Bottles and Containers	0.0%	0.0%	373	Other Asphalt Roofing Material	0.0%	0.0%	148
Flat Glass	0.8%	0.8%	10,108	Clean Dimensional Lumber	4.8%	1.9%	62,070
Remainder/Composite Glass	0.5%	0.3%	6,376	Clean Engineered Wood	1.8%	1.0%	24,090
				Clean Pallets and Crates	1.8%	1.4%	23,645
				Other Wood Waste	14.2%	4.3%	185,190
Metal	**9.0%**		**117,800**	Clean Gypsum Board	0.6%	0.8%	7,678
Tin/Steel Cans	0.2%	0.1%	2,439	Painted/Demolition Gypsum Board	3.7%	3.5%	48,277
Major Appliances	0.0%	0.0%	0	Rock, Soil and Fines	1.9%	1.5%	24,396
Used Oil Filters	0.0%	0.0%	97	Remainder/Composite Inerts and Other	7.5%	3.2%	98,139
Other Ferrous	4.1%	1.5%	52,980				
Aluminum Cans	0.0%	0.0%	483	**Household Hazardous Waste (HHW)**	**0.6%**		**8,201**
Other Non-Ferrous	0.3%	0.3%	4,212	Paint	0.1%	0.2%	1,641
Remainder/Composite Metal	4.4%	2.3%	57,589	Vehicle & Equipment Fluids	0.0%	0.0%	412
				Used Oil	0.0%	0.0%	173
Electronics	**2.1%**		**27,066**	Lead-acid (automotive) Batteries	0.0%	0.0%	0
Brown Goods	0.6%	0.4%	7,224	Other Batteries	0.0%	0.0%	120
Computer-related Electronics - Large	1.3%	2.2%	17,292	Sharps	0.0%	0.0%	17
Computer-related Electronics - Small	0.0%	0.0%	7	Pharmaceuticals	0.0%	0.0%	19
Other Small Consumer Electronics	0.0%	0.0%	310	Fluorescent Lights/Other Mercury-containing Items	0.0%	0.0%	48
Video Display Devices	0.2%	0.2%	2,232	Remainder/Composite Household Hazardous	0.4%	0.5%	5,772
Plastic	**7.2%**		**93,738**	**Special Waste**	**11.9%**		**155,445**
PETE Water Bottles	0.0%	0.0%	298	Ash	0.0%	0.1%	497
PETE Sealed Containers	0.0%	0.0%	220	Treated Medical Waste	0.0%	0.0%	0
Other PETE Containers	0.1%	0.1%	1,610	Bulky Items	11.7%	4.2%	152,612
PLA Water Bottles	0.0%	0.0%	0	Vehicle and Truck Tires	0.0%	0.0%	168
HDPE Containers	0.1%	0.1%	1,915	Other Tires	0.1%	0.1%	1,113
#3-#7 Sealed Containers	0.0%	0.0%	194	Remainder/Composite Special Waste	0.1%	0.1%	1,056
#3-#7 Other Containers	0.2%	0.2%	2,578				
Plastic Trash Bags	0.2%	0.1%	2,416	**Mixed Residue**	**0.3%**		**4,058**
Plastic Grocery and Other Merchandise Bags	0.1%	0.0%	976	Mixed Residue	0.3%	0.2%	4,058
Non-Bag Commercial and Industrial Packaging Film	0.0%	0.0%	141				
Film Products	0.2%	0.1%	2,791				
Food Contact Film Packaging	0.0%	0.0%	481				
Other Film	0.5%	0.3%	6,275				
HDPE Buckets	0.3%	0.2%	4,046				
#3-#7 Buckets	0.0%	0.0%	23				
Durable Plastic Items	3.3%	1.2%	43,616	**Totals**	**100.0%**		**1,302,634**
Remainder/Composite Plastic	2.0%	1.2%	26,157	**Sample Count**	**111**		

Confidence intervals calculated at the 90% confidence level. Percentages for material types may not total 100% due to rounding.