

WASTE DISPOSAL STREAM ANALYSIS

It is very important to have a good picture of waste quantity and composition. It is this knowledge that provides the foundation upon which the solid waste plan is built. In the next few pages, we will show the relationship of waste composition as determined by the residential, commercial, and industrial sectors, and the volumes created by each.

Sources and Quantities

There are three facilities in Hall County where solid wastes are disposed. Any complete analysis of the planning area's waste stream must take into account wastes disposed at these facilities. These facilities are the Hall County Candler Road Landfill, Reliable Tire Service Landfill and Crystal Creek Landfill.

To determine the source of the solid waste entering Hall County's Candler Road Landfill, Hall County personnel conducted a waste assessment of the solid waste entering the landfill. Drivers were interviewed upon entering the landfill to determine the source of waste according to residential, commercial, industrial and construction/demolition debris categories. Definitions were established for each category, and scalehouse personnel were provided a clear understanding of each category in order to explain these, as necessary, to the drivers and obtain the best possible data. In the event of mixed loads, drivers were asked to estimate the percentage from each source. Forms were prepared for recording information in the field. The results of this waste assessment, as well as a similar one conducted in 1991 for the area's first solid waste management planning effort are shown below:

In-County Wastes

Table 1 --Waste Sources Delivered to Hall County Landfill

	November 13-25, 1991	October 20-25, 2003
Commercial	56.8%	16.6%
Industrial	28.5%	21.6%
Residential	14.7%	52.6%
Construction/Demolition	N/A	9.2%

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It should be noted that construction and demolition (C & D) waste was not a required source to survey when the area's original comprehensive solid waste management plan was prepared.

There are several factors for the changing waste distribution from the sources surveyed:

1. Other in-county disposal facilities have come on-line after the original plan was written, diverting wastes to other in-county facilities.
2. Other out-of-county disposal facilities have opened, since the original plan was written, thus providing competing disposal options for both public and private sector waste haulers. Waste exports have increased.
3. Gainesville privatized collection of commercial/industrial waste in 1994. At that time, commercial/industrial waste was estimated at nearly 17,000 tons per year. Private haulers may choose to export waste out of county.

Table 2 --Waste Quantities Disposed in Hall County in Calendar 2002

Hall County Candler Road Landfill	67,528 tons	39.5%
RTS Landfill	88,000 tons	51.4%
Crystal Creek Landfill	15,600 tons	9.1%
Total Tons Disposed	171,128 tons	

Comparing the 67,528 tons of waste delivered to the Hall County Candler Road Landfill in 2002 from Table 2 with the 25,441 tons delivered to all compactor sites in 2002 (see Collection Element, Table 18) yields 36.7 percent of all waste delivered to the landfill originating from the compactor sites. Or put another way, using the figure from Table 1 of 52.6% of waste delivered to the County Landfill being from residential sources, it can be seen that a total of 35,520 tons of residential waste was delivered in 2002. Of this total, waste generated from the County's compactor sites was responsible for 71.6% of all residential waste delivered to the County's landfill in 2002.

Imported Wastes

Hall County does not knowingly allow imported waste to be disposed at the county landfill. However, the two private landfills may accept out of county waste. The Reliable Tire Supply (RTS) Landfill accepted waste originating from 13 North Georgia counties in 2002. Total waste

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accepted in 2002 was 152,893 tons. Waste imported from outside Hall County amounted to 64,893 tons. Data on imported waste accepted at Crystal Creek Landfill are unavailable.

Exported Wastes

There is also a considerable amount of Hall County's waste that is disposed in facilities outside Hall County. This includes residential waste from Clermont, Flowery Branch and Gillsville. In 2002, this amounted to 1,065 tons. Cost (tip fees) appears to be the chief reason for this. Location also plays a part in that these cities are located on or near the boundaries of Hall County, making the choice of using nearby out of county facilities a preferred option. However, the vast majority of exported waste is most likely commercial, industrial, and construction/demolition wastes, which are heavily controlled by the private sector.

The amount of waste received at the County's landfill has declined due, hopefully, to reduction efforts but more likely due to economic reasons. This fact was evident when the last tip fee increase took effect on October 1, 1993. Monthly totals from September to October showed a decrease of over 1,000 tons! This massive decrease from one month to the next certainly was not due solely to waste reduction activities. Likely, what has happened is private waste haulers are choosing to use other, lower cost facilities. Also, there are now more facilities to choose from than there were in the early 1990's (see Table 3).

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Table 3 --Hall County Waste Exports in Calendar 2002

	Facility Name	Facility Type Description	Dominion	Source Of Waste	Tonnage Reported
BANKS	CHAMBERS R & B LANDFILL SITE #2	Municipal Solid Waste Landfill	Private Commercial	Hall Co	430.16
BARROW	REPUBLIC WASTE-OAK GROVE MSWLF SR324	Municipal Solid Waste Landfill	Private Commercial	Hall Co	12,943.88
BARROW	REPUBLIC WASTE-OAK GROVE MSWLF SR324	Municipal Solid Waste Landfill	Private Commercial	Gainesville	25.01
BARROW	REPUBLIC WASTE-OAK GROVE MSWLF SR324	Municipal Solid Waste Landfill	Private Commercial	Flowery Branch	158.17
CHEROKEE	CHEROKEE CO-PINE BLUFF LANDFILL, INC.	Municipal Solid Waste Landfill	Private Commercial	Hall Co	62.43
DEKALB	PHILLIPS-SCALES RD C&D (L)	Construction and Demolition Landfill	Private Commercial	Hall Co	218.51
DEKALB	WMI-LIVE OAK #2 (SL)	Municipal Solid Waste Landfill	Private Commercial	Flowery Branch	51.79
DEKALB	WMI-LIVE OAK #2 (SL)	Municipal Solid Waste Landfill	Private Commercial	Gainesville	2.65
DEKALB	APAC/GA-DONZI LN PH 5A (L)	Construction and Demolition Landfill	Private Commercial	Hall Co	12.65
DEKALB	BFI-EAST DEKALB LANDFILL	Construction and Demolition Landfill	Private Commercial	Hall Co	5.18
DEKALB	BFI-HICKORY RIDGE (MSWL)	Municipal Solid Waste Landfill	Private Commercial	Hall Co	7.16
FORSYTH	EAGLE POINT LANDFILL	Municipal Solid Waste Landfill	Private Commercial	Gainesville	11.48
FORSYTH	EAGLE POINT LANDFILL	Municipal Solid Waste Landfill	Private Commercial	Hall Co	4,191.60
FULTON	CHADWICK RD LANDFILL, INC.	Construction and Demolition Landfill	Private Commercial	Hall Co	59.10
FULTON	CHAMBERS-BOLTON RD (SL)	Municipal Solid Waste Landfill	Private Commercial	Hall Co	10.59
GWINNETT	BFI-RICHLAND CREEK RD (SL)	Municipal Solid Waste Landfill	Private Commercial	Hall Co	73,127.57
OGLETHORPE	OLGETHORPE CO-US 78 C/D LANDFILL	Construction and Demolition Landfill	PUBLIC	Hall Co	7.32

91,325.25

Source: Georgia Environmental Protection Division

To the 91,325.25 tons of exported waste must be added the 1,065 tons exported by cities in Hall County for a total of 92,390 tons (rounded off) of exported waste in 2002.

Due to this waste exportation, it is likely that the current 5.54 lbs./capita/day generation rate is artificially low. The per capita waste generation rate from the base year of 1992 is likely more accurate. At that point in time, there were simply no other disposal alternatives. The county's

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landfill was the only option. Thus, the per capita generation rate of 6.41 lbs/capita/day is likely more accurate.

This exportation, plus the waste diverted to RTS Landfill, helps to explain the large reduction in tons from which the County landfill has not recovered that occurred with the last tip fee increase.

Total Hall County Waste Generation

To arrive at the total waste generated by Hall County, one must take the sum of all waste generated and disposed within the county, as well as all waste generated within the county and exported to out of county disposal facilities. This total waste generation amounted to 262,453 tons in 2002 (Table 4).

Table 4 --Disposition of Hall County Generated Waste 2002

Hall County Candler Road Landfill	67,528 tons	26%
RTS Landfill	88,000 tons	33%
Crystal Creek Landfill	15,600 tons*	6%
Exported	91,325 tons	35%
Total	262,453	

* estimated at 1,000 cu. yds./week and 600 lbs./cu. yd.

Assuming that virtually all of the waste exported from Hall County is commercial and industrial, except for the documented 1,065 tons known to be exported by cities (residential) and deleting Crystal Creek waste (difficult to determine which sector generated this), would result in the breakdown shown in Table 5. It is interesting to note that the overall contribution of residential waste to total waste generation is still roughly 15% (compare Table 1). The vast majority of waste generated in Hall County is still from other than residential sources.

Table 5-- Waste Generated By Source 2002

Commercial/Industrial	47%
Residential	14.8%
Construction/Demolition	38.2%

Classifying Waste Sources:

Residential - Waste generated by households whether single or multiple households (duplexes up to apartment complexes).

Commercial - Waste generated by retail businesses such as restaurants, stores, shopping malls. Schools, as well as government offices, should be categorized here.

Industrial - Waste generated from manufacturers or processors. This sector makes things that are sold by retailers. Examples: Wrigley's, Glidden Co., Peachtree Windows and Doors, ConAgra, Cargill, etc.

C and D (construction and demolition debris) - Waste generated as a result of new construction, remodeling, or demolition of existing structures. This is more of a waste type than a source, as it could be from individuals doing home remodeling (residential) just as easily as a commercial demolition job (commercial).

WASTE FLUCTUATIONS

Seasonal Composition

As shown in Table 6, waste composition (especially residential) can and does vary seasonally. For example, there is a higher percentage of glass in the waste stream in the summer months, undoubtedly tied to higher beverage consumption during the warmer weather. Also, in the winter, there is a greater percentage of tin cans that could be consistent with less availability of fresh, local produce.

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Quantity

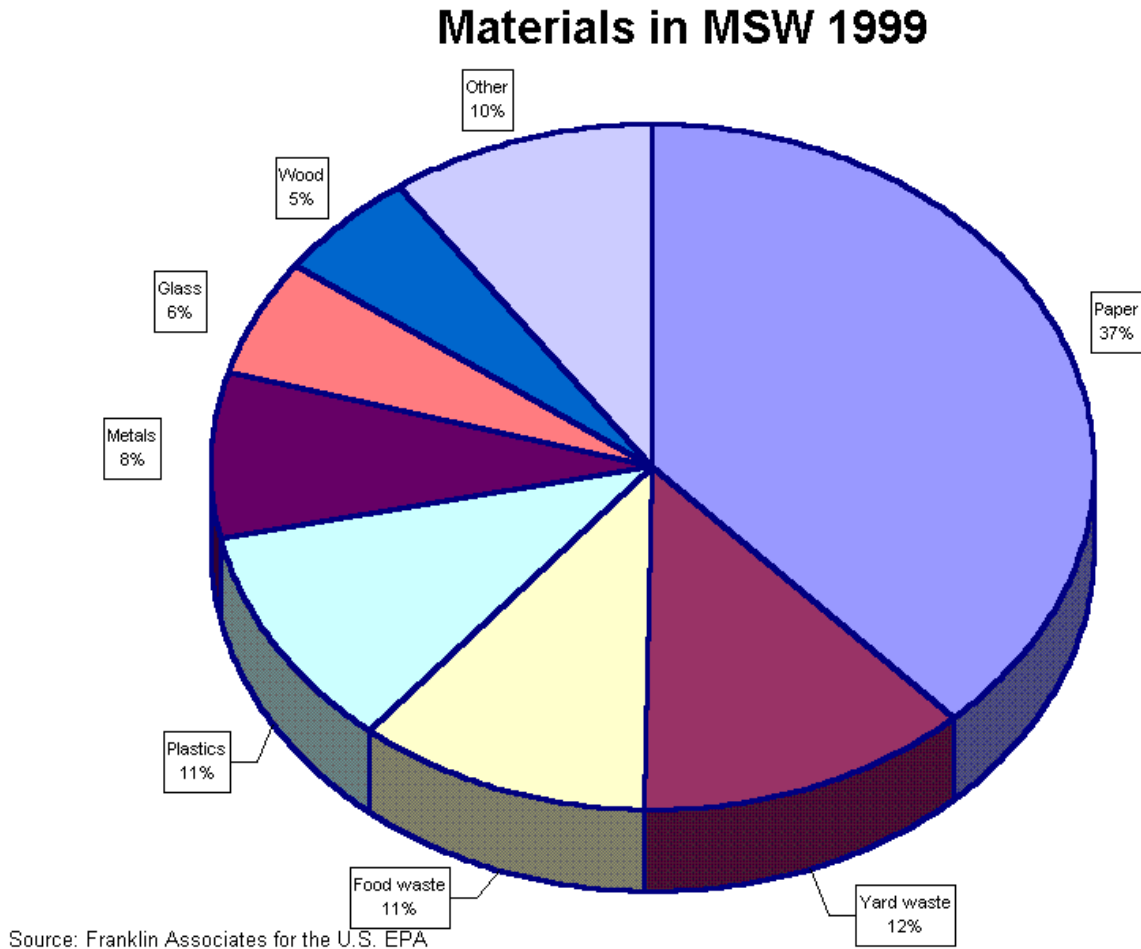
The planning region does not experience any noteworthy seasonality with respect to waste quantities. The only exceptions to this would be greater production of waste following the Christmas holiday and disasters. This, however, is not peculiar to Hall County. Seasonal public events and festivals do not have an appreciable effect on waste quantities.

Disasters, however, have had an appreciable, but temporary, impact on waste quantities. This was shown in the case of the county's last major ice storm in spring of 2000. This storm event produced an estimated 12,700 cubic yards of processed wood mulch.

Trees and vegetation from the March 20, 1998 tornado amounted to an estimated 99,600 cubic yards that was burned with air-curtain destructors. Demolition waste from homes and other buildings damaged or destroyed in the storm amounted to 1,318.48 tons disposed of at R.T.S. Landfill.

COMPOSITION

Figure 1—Waste Composition



RESIDENTIAL WASTE STREAM ANALYSIS

Background

During 1994 and 1995, the Hall County Resource Recovery Division completed an analysis of the county's residential waste stream and residents' recycling practices. The results of the composition portion of the study are reported here. Please see "Waste Reduction Element" for the study results pertaining to recycling.

Waste Disposal Stream Analysis

The waste stream characterization that was done for the 1993 plan pointed out some suspect numbers, especially in regard to yard waste. The county survey estimated yard waste at 2.9 percent; whereas, the national average was 17.2 percent. For this reason, as well as to provide information as to the composition of the Hall County residential waste remaining after recycling, a detailed waste assessment was recommended. The assessment was completed in 1995.

Methodology

An attempt was made to include waste from compactor sites in different areas of the county. During each seasonal sort, a total of four compactor sites were sampled at an approximate sample size of 250 pounds each, as recommended in the literature. Bags were picked at random from waste immediately upon being dumped at the landfill working face. Waste was sampled seasonally in the fall (November 17, 21 and December 8, 1994), winter (January 23, 24, 25, and 26, 1995) and summer (August 1, 3 and 4, 1995). The periods immediately following Thanksgiving and Christmas were avoided to reduce the influence of seasonal waste associated with these holidays. The sampling periods were chosen to be indicative of a typical fall, winter and summer waste stream. Samples were weighed on truck scales at the recycling center to assure an approximate 250-pound sample existed before being sorted.

Bags were placed two at a time on a 4' x 8' sheet of plywood on sawhorses for de-bagging and sorting. The contents of each bag, including the bag itself, were separated into the 19 categories shown in Table 6 and weighed. Scales used included a platform scale with one pound graduations and a postal scale with one-ounce graduations. The postal scale was used for the lighter weight materials that might not register accurately on the larger scale.

Findings

Residential Waste Composition

Table 6 --Hall County Seasonal Waste Composition

<u>MATERIAL</u>	FALL 1994 PERCENT COMPOSITION	WINTER 1995 PERCENT COMPOSITION	SUMMER 1995 PERCENT COMPOSITION
GLASS (CLEAR,BROWN, GREEN)	7.9	7.5	10.1
HDPE #2 NATURAL	0.6	0.7	0.6
HDPE #2 COLORED	0.7	0.7	0.4
PETE #1 MIXED	1.9	1.4	1.6
MAGAZINES	3.6	4.4	3
NEWSPAPER	5.4	4.9	4.7
CORRUGATED CARDBOARD	2.2	1.8	2.2
ALUMINUM BEVERAGE CANS	1.9	1.7	1.6
TIN CANS	3.5	5.1	2.8
OTHER VARIOUS MIXED PLASTIC	10.9	7.8	11
BOX BOARD	4.6	5.2	5.2
YARD WASTE	1	0.9	0.3
RECYCLABLE MIXED PAPER	2	3	2.8
NON RECYCLABLE MIXED PAPER	14.2	15.3	10.1
NON RECYCLABLE GLASS	0.7	0.6	1
ORGANICS	14.7	25	21.1
TEXTILES	6.8	2.4	10
OTHER MIXED METALS	1.1	0.7	1
ALL OTHER MATERIAL	16.3	10.9	10.6
TOTALS	100	100	100

Source: Hall County Resource Recovery Division. "Hall County Recycling Participation Survey and Residential Waste Stream Analysis" (1995, September)

Business Waste Composition

Hall County has not undertaken any studies of waste composition from business sources. Therefore, a search of the literature was conducted for available information.

Commercial Waste Composition

Table 7--Commercial Waste Composition

Landfilled Waste Composition for the Commercial Sector (Weight Percent) –Alameda County, CA

<u>Category</u>	<u>Percent</u>
Paper	31.3
Plastic	13.9
Glass	2.3
Metals	5.5
Yard Waste	4.2
Other Organics	35.2
Other Waste	7.6

Source: 2000 Solid Waste Characterization Study for Alameda County, California--R.W. Beck, Inc

Industrial Waste Composition

Industrial waste loads are frequently homogeneous, containing a single waste product from a manufacturing process. This makes determining waste composition problematic, since wastes are more industry specific. Research in this area was performed by the California Integrated Waste Management Board.

The data were collected by sorting garbage samples from individual businesses in Southern California. Only waste disposed in dumpsters was sorted, so that material recycled at the businesses that were sampled is not included in this data. It is assumed that businesses of a certain type (say construction) dispose similar wastes, regardless of location or size of the business. This average data may not reflect the composition at a particular business or in a particular area. However, it does provide a good starting point.

Waste Disposal Stream Analysis

Some waste compositions from industries representative of Hall County were extracted from the study to show what these types of businesses are likely to dispose.

Table 8 --Industrial Waste Composition for Selected Business Types

<u>Business Type</u>	<u>Largest Waste Types and (Percent by Weight)</u>
Construction	Lumber (16.2%), Composite Construction and Demolition (11.3%), Composite Organic (6.5%), Corrugated Cardboard (5.6%)
Food Manufacturing	Food (22.4%), Composite Paper (18.6%), Film Plastic (12.5%), Lumber (6.5%)
Manufact. - Indust. Machinery	Other Ferrous (10.6%), Corrugated Cardboard (9.5%), Lumber (8.7%), Composite Paper (8.1%)
Manufact. - Transportation Equip.	Lumber (14.7%), Composite Paper (12.4%), Corrugated Cardboard (10%), Other Misc. Paper (5.3%)

Source: California Integrated Waste Management Board, Statewide Waste Characterization Study: Results and Final Report

Construction/Demolition Wastes

The estimated national per capita generation rate of building-related C&D debris in 1996 was 2.8 pounds per person per day. This compares favorably with Hall County's known 5.54 lbs. per person per day generation rate and the 51.4 % of the county's waste disposed at RTS Landfill.

Composition of C&D Debris from Buildings

The composition of C&D debris is highly variable and depends critically on the type of activity where sampling is done. Whereas wood is typically the largest component of waste material generated at construction and renovation sites, concrete is commonly the largest component of building demolition debris.

Waste Disposal Stream Analysis

Table 9 --Typical Composition of C&D Wastes from Urban Areas

<u>Material Description</u>	<u>% of Total Volume</u>
Wood Materials	
Construction Lumber	25.0
Pallets	2.0
Trees & Stumps	5.0
Paper Products	
Cardboard	17.0
Rolled Paper	0.2
Other Misc. Paper	0.6
Concrete Products	
Concrete Block	1.0
Poured Concrete Sections	1.0
Plaster	0.3
Brick	0.2
Plastic Products	
Plastic Pails	1.0
Plastic Pipe	0.2
Polyethylene Sheet & Styrofoam	0.8
Metal Products	
Ferrous Metals	5.0
Non Ferrous Metals	2.0
Roofing Materials	
Shingles	3.0
Built-up Roofing	5.0
Roofing Insulation	5.0
Earth Material	
Soil	2.0
Miscellaneous Materials	
Drywall	15.0
Broken Glass/Windows	0.1
Doors and Frames	0.1
Insulation	4.0
Paint Containers (empty)	0.8
Ceiling /Floor Tile	0.8
Carpet Remnants	2.0
Ceramic Tile	0.1
Plumbing Fixtures	<0.1
Electrical Fixtures	<0.1
Unacceptable Materials Separated for Proper Disposal	
Batteries	<0.1
White Goods	0.1
Tires	0.2
Furniture	0.2
Household Garbage	0.2
Total Volume	100%

Source: Kimmins Recycling Corp. (Tampa, FL) as reported in "Waste Age", January 1992

WASTE PROJECTIONS

Quantity Projections

Tables 10 through 16 use current scale data, population figures, and per capita waste generation to project waste quantities into the future. For simplicity, per capita waste generation is assumed to remain constant throughout the planning period.

City of Clermont

**Table 10 --Projections for Waste to be Generated by
The City of Clermont**

YEAR	POPULATION SERVED	WASTE PER CAP./DAY(1)	TONS PROJECTED
2002	658	1.40	168(2)
2003	693	1.40	177
2004	729	1.40	186
2005	764	1.40	195
2006	800	1.40	204
2007	835	1.40	213
2008	871	1.40	222
2009	906	1.40	231
2010	942	1.40	241
2011	977	1.40	249
2012	1013	1.40	259
2013	1048	1.40	268

(1) For comparison, baseline 1992 per capita waste generation was 0.79 lbs.

(2) Actual; Includes only residential component collected by city

Sources: Native Intelligence and Woods and Poole

City of Flowery Branch

**Table 11 --Projections for Waste to be Generated by
The City of Flowery Branch**

YEAR	POPULATION SERVED	WASTE PER CAP./DAY(1)	TONS PROJECTED
2002	1,944	2.34	830(2)
2003	2,377	2.34	1,015
2004	2,810	2.34	1,200
2005	3,244	2.34	1,385
2006	3,900	2.34	1,665
2007	4,556	2.34	1,946
2008	5,212	2.34	2,226
2009	5,868	2.34	2,506
2010	6,526	2.34	2,787
2011	7,244	2.34	3,094
2012	7,962	2.34	3,400
2013	8,680	2.34	3,707

(1) For comparison, baseline 1992 per capita waste generation was 2.13 lbs.

(2) Actual; Includes only residential component collected by city

Sources: Native Intelligence and Woods and Poole

City of Gainesville

**Table 12 --Projections for Residential Waste to be Generated by
The City of Gainesville**

YEAR	POPULATION SERVED	WASTE LBS. PER CAP./DAY(1)	TONS PROJECTED
2002	28,090	1.50	7,690(2)
2003	29,662	1.50	8,120
2004	30,731	1.50	8,427
2005	31,842	1.50	8,732
2006	32,797	1.50	8,994
2007	33,781	1.50	9,264
2008	34,794	1.50	9,541
2009	35,986	1.50	9,868
2010	37,188	1.50	10,198
2011	38,061	1.50	10,437
2012	38,935	1.50	10,677
2013	39,808	1.50	10,916

(1) For comparison, baseline 1992 per capita waste generation was 1.69 lbs.

(2) Actual; Includes only residential component collected by city

Source: Hall County Future Land Use Plan 2004

City of Gillsville

**Table 13 --Projections for Waste to be Generated by
The City of Gillsville**

YEAR	POPULATION SERVED	WASTE PER CAP./DAY(1)	TONS PROJECTED
2002	198	1.85	67(2)
2003	200	1.85	68
2004	202	1.85	68
2005	204	1.85	69
2006	206	1.85	70
2007	208	1.85	70
2008	210	1.85	71
2009	212	1.85	72
2010	214	1.85	72
2011	216	1.85	73
2012	218	1.85	74
2013	220	1.85	74

(1) For comparison, baseline 1992 per capita waste generation was 0.79 lbs.

(2) Actual; Includes only residential component collected by city

City of Lula

**Table 14 --Projections for Waste to be Generated by
The City of Lula**

YEAR	POPULATION SERVED	WASTE PER CAP./DAY(1)	TONS PROJECTED
2002	1,543	1.34	378(2)
2003	1,635	1.34	401
2004	1,727	1.34	422
2005	1,819	1.34	445
2006	1,911	1.34	467
2007	2003	1.34	490
2008	2095	1.34	512
2009	2187	1.34	535
2010	2,279	1.34	557
2011	2,371	1.34	580
2012	2,463	1.34	602
2013	2,555	1,34	625

(1) For comparison, baseline 1992 per capita waste generation was 1.57 lbs.

(2) Actual; Includes only residential component collected by city

City of Oakwood

**Table 15 --Projections for Waste to be Generated by
The City of Oakwood**

YEAR	POPULATION SERVED	WASTE PER CAP./DAY(1)	TONS PROJECTED
2002	2,908	0.75	397(2)
2003	3,042	0.73	415
2004	3,176	0.73	423
2005	3,310	0.73	441
2006	3,444	0.73	459
2007	3,578	0.73	477
2008	3,712	0.73	495
2009	3,846	0.73	512
2010	3,980	0.73	530
2011	4,114	0.73	548
2012	4,248	0.73	566
2013	4,382	0.73	584

(1) For comparison, baseline 1992 per capita waste generation was 0.97 lbs. May be artificially low due to local trend that some housing developments are opting to use private service providers.

(2) Actual; Includes only residential component collected by city

**Hall County
Table 16 --Hall County Waste Projections**

YEAR	POPULATION SERVED	WASTE PER CAP./DAY(1)	TONS PROJECTED
2002	153,919	9.34	262,453(2)
2003	162,372	9.34	276,867
2004	169,966	9.34	289,815
2005	176,765	9.34	301,409
2006	183,835	9.34	313,464
2007	191,189	9.34	326,003
2008	198,836	9.34	339,043
2009	206,790	9.34	352,605
2010	215,061	9.34	366,708
2011	224,307	9.34	382,474
2012	233,553	9.34	398,240
2013	242,799	9.34	414,006

(1) For comparison, baseline 1992 per capita waste generation was 6.41 lbs.

(2) Actual; Includes all waste disposed of in disposal sites located within Hall County as well as all reported waste exports.

COMPOSITION PROJECTIONS

It is inevitable that waste composition will change with the passage of time. This has been seen with the emergence of plastics in the waste stream. Also, in the past ten years, the amount of colored HDPE plastic has increased with an increasing number of milk containers converting from natural HDPE. This change has resulted in the need to alter the labeling of the county's collection containers to allow more space for colored HDPE.

While not an exact science, it may be possible to develop an idea of future waste composition. With knowledge of economic trends, as to the employment mix and types of wastes produced by a given business, it may be possible to forecast changes in waste composition. Trends in consumer goods and purchasing choices will influence residential waste composition. This factor is perhaps more difficult to predict.

Waste Disposal Stream Analysis

During the 1990's, approximately 20,000 jobs were added to the county's work force. Almost two-thirds of these were in the three sectors of retail trade, government and services. Most of the remainder were in wholesale trade and manufacturing. Modest gains occurred in finance, insurance, real estate, transportation, utilities, communications and construction.

As of 2001, Hall County's employment mix was 35.4 percent in goods producing industries, 51.6 percent in service producing industries, 12.8 percent in total government and 0.2 percent unclassified industry. The shift toward white-collar jobs is expected to continue for the planning area.

Overwhelmingly leading the manufacturing segment is food manufacturing, which comprises over 40 percent of this segment. Second in this segment is machinery manufacturing with 2.5 percent, followed by transportation equipment at 2.1 percent.

The service-producing segment is lead by retail trade at 10.8 percent and health care and social services at 10.1 percent. Accommodation and food services weigh in at 6.6 percent.

The Five Largest Employers in Hall County are:

- Conagra Poultry Co.
- Fieldale Farm Corp.
- Kubota Manufacturing
- Mar-Jac Poultry
- Northeast Georgia Medical Center

Table 17 is reflective of the residential growth occurring in the planning area. Agriculture showed the greatest losses in all areas—average employment, percent employed and proportional change. Residential growth has resulted in a decline in available agricultural lands and has, undoubtedly, caused compatibility issues with common agricultural practices, such as spreading of broiler litter, which can lead to odor complaints from nearby residents. Numbers employed by this sector will likely continue to decline as will generation of agricultural production wastes. Chief among these would be those related to the area's poultry industry such as manures, litter and poultry mortality. As the poultry growing areas are pushed out farther from the county,

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demolition wastes might result from chicken houses being replaced by residential growth. The area's limited dairy farming may face similar pressures and resulting waste change impacts.

Increases in all categories for construction also testifies to the growth the area continues to experience. Increases in construction and demolition wastes can be expected. It is interesting to note that, as shown previously, disposal of C and D wastes at the RTS Landfill now comprises the majority (56%) of all solid wastes disposed of in Hall County.

The economic trend explained in the text and verified by recent employment information contained in Table 17 points toward continued increases in the areas of services, finance, insurance, real estate, and public administration (government). Manufacturing is likely to remain the largest employment area. The following chart lists the types of services available in Hall County and their potential waste products.

<u>Industry</u>	<u>Potential Examples</u>	<u>Waste Products</u>
Services	Hotels, other lodging; Business Services; Health Services; Educational Services; Social Services; etc.	food, medical, office paper, cardboard, food service plastics, bedding
Finance/Insurance/Real Estate	Banks, Insurance, Real Estate	office paper, computer paper, cardboard
Public Administration	Federal, State, Local Governments	office paper, computer paper, cardboard

Because a relatively small amount of the total waste is due to residential influences, most of the influence on future waste composition will be from commercial and industrial sectors. As shown above, waste composition over the next ten years will be influenced primarily by increases in cardboard, office paper, computer paper and food wastes.

Waste Disposal Stream Analysis

Table 17 --Changes in Employment Mix-Hall County

<u>Employment Classification</u>	<u>1991 Ave. Employment</u>	<u>Percent</u>	<u>2001 Ave. Employment</u>	<u>Percent</u>	<u>Proportional Change (%)</u>
Agriculture	1,001	2.3	677	1.1	-54.4
Mining	6	<0.1	79	0.1	+887
Construction	1,873	4.3	3,264	5.1	+17.4
Manufacturing	13,334	30.9	18,688	29.2	-5.6
Service Producing	23,748	55.1	33,086	51.6	-6.2
Government	3,120	7.2	8,174	12.8	+76.4
TOTALS	43,082	99.9*	63,968	99.9*	+48.5

*Rounding error

Waste Disposal Stream Analysis

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