



# **FORSYTH COUNTY**

**AND THE MUNICIPALITIES OF BETHANIA,  
CLEMMONS, KERNERSVILLE, LEWISVILLE, RURAL  
HALL, TOBACCOVILLE, WALKERTOWN AND  
WINSTON-SALEM**

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## **10 YEAR SOLID WASTE MANAGEMENT PLAN**

**For the Planning Period of  
July 1, 2012 - June 30, 2022**

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**Prepared by the  
Winston-Salem/Forsyth County Utility Commission**





## **Acknowledgements**

Although the front cover of this Solid Waste Management Plan bears the name of the Winston-Salem/Forsyth County Utility Commission, it is a result of the cooperation and collaboration between many political bodies, town administrators and government employees. Each town, village or city provided invaluable help in compiling and insuring the accuracy of the information contained herein. The Commission would like to thank:

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# TABLE OF CONTENTS

<b>Executive Summary .....</b>	<b>1</b>
<b>Section 1     <b>The Planning Process.....</b></b>	<b>5</b>
1.1     Background.....	5
1.2     Vision .....	6
1.3     Objectives .....	7
<b>Section 2     <b>Planning Area Profiles.....</b></b>	<b>9</b>
2.1     Geographic, Economic and Demographic Profile .....	9
2.2     County Waste Management Profile .....	10
2.3     Municipal Waste Management Profile .....	12
<b>Section 3     <b>Waste Stream Evaluation.....</b></b>	<b>15</b>
3.1     Waste Stream Characterization Study .....	15
<b>Section 4     <b>Waste Reduction Goals and Plan .....</b></b>	<b>17</b>
4.1     Background.....	17
4.2     Forsyth County Goals .....	18
4.3     Waste Reduction Plan.....	23
<b>Section 5     <b>Solid Waste Planning Elements .....</b></b>	<b>25</b>
5.1     Source Reduction .....	25
5.2     Collection.....	26
5.3     Recycling .....	29
5.4     Reuse .....	33
5.5     Composting and Mulching.....	34
5.6     Waste to Energy Technologies .....	36
5.7     Transfers Outside Geographic Area.....	36
5.8     Disposal.....	40
5.9     Community Education and Outreach.....	43
5.10    Special Wastes .....	45
5.10.1    Scrap Tires.....	45
5.10.2    White Goods.....	46
5.10.3    Used Motor Oil and Filters.....	47
5.10.4    Household Hazardous Waste.....	47
5.10.5    Electronic Waste.....	48
5.10.6    Abandoned Manufactured Homes.....	49
5.11    Illegal Disposal and Litter.....	50
5.12    Purchasing Recycled Products .....	52
<b>Section 6     <b>Emergency and Disaster Response.....</b></b>	<b>53</b>
<b>Section 7     <b>Solid Waste Management Costs and Financing.....</b></b>	<b>55</b>
7.1     Costs – Descriptions and Assessment.....	55
7.2     Financing Methods.....	59

**Appendices**

Appendix A-1 – Notice of Public Meeting ..... 63  
Appendix A-2 – Public Comments to the SWM Plan Update..... 64  
Appendix B – Resolutions from Participating Local Governments Adopting the Plan ..... 66  
Appendix C-1 – Map of Planning Area ..... 77  
Appendix C-2 – Solid Waste Management Facilities in Forsyth County..... 78  
Appendix D-1 – Waste Composition at Hanes Mill Rd. Landfill - Residential ..... 79  
Appendix D-2 – Waste Composition at Hanes Mill Rd. Landfill - Commercial ..... 80  
Appendix D-3 – Waste Composition at Old Salisbury Road C & D Landfill..... 81  
Appendix E – Waste Reduction Goal Sheet ..... 82  
Appendix F – Summary of Local Government Solid Waste Collection Programs ..... 83  
Appendix G – Municipal/County Recycling Tonnages by Material Type ..... 86

# LIST OF TABLES & FIGURES

## Tables

ES-1	Solid Waste Management Summary.....	1
ES-2	Comparison of Solid Waste Managed, FYE 2008 vs. FYE 2011.....	2
ES-3	Per-Capita Disposal FYE 2002 to 2011.....	3
2-1	10 Largest Employers in CY 2011.....	9
2-2	Estimated Populations by Jurisdiction, July 2010.....	10
2-3	Solid Waste Management Methods.....	11
2-4	Residential Solid Waste Managed by Forsyth County Municipalities.....	13
2-5	Residential Disposal Rates for Municipalities in Forsyth County.....	14
4-1	Actual Waste Disposal Per-Capita by Year, FYE 1997 to 2011.....	19
4-2	Waste Reported, Disposed and Recovered Per-Capita.....	20
4-3	Waste Disposal Per-Capita for North Carolina's 10 Most Populous Counties.....	20
4-4	Summary of Waste Reduction Goals.....	22
5-1	Private Waste Collection Companies Operating in Forsyth County.....	27
5-2	Bulky Item Collection Programs by Municipality.....	28
5-3	Special Recycling Collection Events in Forsyth County.....	31
5-4	Solid Waste Disposed In-County vs. Out-of-County.....	37
5-5	Solid Waste Disposed In-County vs. Out-Of-County, FYE 2002 to 2011.....	38
5-6	Tip Fee Comparison Among Largest NC Landfills.....	41
5-7	Economic Development Benefits of Hanes Mill Rd. Landfill.....	42
5-8	Special Wastes Managed.....	45
5-9	Materials Accepted at the Enviro-Station.....	47
5-10	E-Waste Management Account Expenses and Revenues.....	49
7-1	Solid Waste Collection and Disposal Costs by Municipality.....	56
7-2	Recycling Collection and Processing Costs by Municipality.....	56
7-3	Yard Waste Collection and Processing Costs by Municipality.....	56
7-4	Detailed Annual Operating Costs for CCUC Solid Waste Management Services.....	58
7-5	Capital Expenses for CCUC Solid Waste Management Services.....	59
7-6	Sources of Funding for CCUC Solid Waste Programs.....	59
7-7	Solid Waste Disposal Tax Distributions by Jurisdiction.....	61

## Figures

ES-1	Per-Capita Disposal FYE 2002 to FYE 2011.....	4
2-1	Solid Waste Reported, Disposed and Recovered FYE 2002 to 2011.....	12
3-1	Residential Waste.....	16
3-2	Commercial Waste.....	16
3-3	C & D Waste.....	16
4-1	Annual Tonnages at Old Salisbury Rd. C & D Landfill.....	23
5-1	Municipal Solid Waste Disposed In-County vs. Out-of-County, FYE 2002 to 2011.....	38
7-1	Actual Operating Costs for CCUC Programs & Services.....	57
7-2	Actual Revenues from CCUC Services.....	60
7-3	Solid Waste Disposal Fund Schedule of Revenues, Expenditures and Transfers.....	62

## EXECUTIVE SUMMARY

This Update of the Forsyth County 10 Year Solid Waste Management Plan is for the planning period beginning July 1, 2012 and ending June 30, 2022. Forsyth County and all of its incorporated municipalities participated in the preparation of this Plan. A map showing the planning area is contained in Appendix C-1. The Winston-Salem/Forsyth County Utility Commission, also known as the City/County Utility Commission (CCUC), was the lead agency in preparing the Plan and conducting the public meeting at which public input was received. The most recent and complete solid waste management data available at the time of writing this Plan was from fiscal year ending (FYE) 2011 and is used throughout. All references to population, tonnage and financial data are for FYE 2011 and Forsyth County unless otherwise explicitly stated. When making comparisons with previous years, data from FYE 2008 is used, which was the most recent and complete data available at the time the previous Plan was written.

Forsyth County generated approximately 490,427 tons of solid waste in FYE 2011. (See Table ES-1.) Of the total amount generated, 410,934 tons, or 83.8% were disposed. Municipal Solid Waste (MSW) made up the largest category of disposed waste at 361,727 tons followed by C & D waste at 49,207 tons. MSW made up 88% of waste that was disposed and 73.8% of all waste generated. C & D waste was 12% of the disposed category and 10% of waste generated. Recycled/recovered and composted materials accounted for 79,493 tons, or 16.2%, of the total amount of waste generated. Composting accounted for 49,286 tons or 62% of all recovery while recycling programs accounted for 23,396 tons or 29.4%. Small amounts of C & D waste and Household Hazardous Waste (HHW) were recovered, combined representing approximately 1.4% of total generation.

### Solid Waste Management Summary

Management Practice	Tons	% Category	% Total
MSW Disposed	361,727	88.0%	73.8%
C & D Disposed	49,207	12.0%	10.0%
<b>Total Disposed</b>	<b>410,934</b>	<b>100%</b>	<b>83.8%</b>
Recycled/Recovered	23,396	29.4%	4.8%
C & D Recovered	6,557	8.2%	1.3%
Composted	49,286	62.0%	10.0%
Other (HHW)	254	0.3%	0.1%
<b>Total Recycled/Recovered</b>	<b>79,493</b>	<b>100%</b>	<b>16.2%</b>
<b>Total Reported</b>	<b>490,427</b>		<b>100.0%</b>

Table ES-1

When compared to data from the previous Solid Waste Plan (FYE 2008), the total amount of waste generated in Forsyth County fell by 83,890 tons or 14.6% in FYE 2011. (See Table ES-2.) Total solid waste disposed from Forsyth County declined by 97,213 tons, or 19.1%. MSW disposal decreased by 14.3% and C & D waste disposal decreased by 42.7%. Recycling and recovery grew by 20.1%. The dramatic declines in waste disposed, particularly C & D waste, reflect the continued poor conditions of the economy. The CCUC has not experienced this kind of decrease in waste disposal at its landfills since record keeping began.

**Comparison of Solid Waste Managed  
FYE 2008 vs. FYE 2011**

Management Practice	FYE 2008 Tons	FYE 2011 Tons	Change	% Change
MSW Disposed	422,214	361,727	-60,487	-14.3%
C & D Disposed	85,933	49,207	-36,726	-42.7%
<b>Total Disposed</b>	<b>508,147</b>	<b>410,934</b>	<b>-97,213</b>	<b>-19.1%</b>
Recycled/Recovered	21,647	23,396	1,749	8.1%
C & D Recovered	603	6,557	5,954	987.5%
Composted	43,702	49,286	5,584	12.8%
Other (HHW)	218	254	36	16.5%
<b>Total Recycled/Recovered</b>	<b>66,170</b>	<b>79,493</b>	<b>13,323</b>	<b>20.1%</b>
<b>Total Reported</b>	<b>574,317</b>	<b>490,427</b>	<b>-83,890</b>	<b>-14.6%</b>

**Table ES-2**

The estimated population of Forsyth County was 351,798 in FYE 2011, compared to 338,679 in FYE 2008, an increase of 3.9% or 1.3% annually. The disposal rate for Forsyth County decreased from 1.5 tons per-capita in FYE 2008 to 1.17 tons per-capita in FYE 2011 or 22%. The per-capita waste disposal rate of 1.17 tons is a decrease of 12.7%, from the 1989 baseline year rate of 1.34 tons.

This decrease in the waste disposal rate exceeds the FYE 2019 waste reduction goal of 1.27 tons per-capita that was established in the 2009 Plan Update. In that Update, Forsyth County adopted the following waste reduction goal.

- ***By June 30, 2019, achieve a disposal rate of 1.27 tons per-capita, which is 5.0% below the 1988-89 baseline year rate of 1.34 tons per-capita.***

The conditions contributing to less waste disposal that existed three (3) years ago continue today and in some cases are more striking. A large percentage of waste is being transferred out of Forsyth County for disposal by private waste management companies thereby reducing revenues at publicly operated facilities and threatening one of the primary funding sources for waste reduction programs. This practice also preempts the potential to recycle some of the waste through public programs within the County. Over the last 3 years, the amount of waste transferred out of the county rose from 36.1% to 38%. During the same time, CCUC waste disposal facilities have seen their share of disposal drop from 63.9% to 62%. If large percentages of Forsyth County waste continue to be managed by organizations that are not required to develop or attempt to achieve waste reduction goals nor abide by other elements of the host county's Solid Waste Management Plan, these goals will be difficult, if not impossible, to achieve under normal economic conditions. Although NCGS 130A-309.09D(a) gives local governments the authority to implement solid waste regulatory controls such as mandatory recycling or local disposal bans, the lack of such controls in the planning area will continue to frustrate efforts to achieve the stated waste reduction goals.

Table ES-3 shows disposal rates in Forsyth County over the last 10 years with corresponding percentage changes from the baseline year of 1988-89. Figure ES-1 is a graphical illustration of

disposal per-capita over the last 10 years. Since County recycling and recovery programs have remained essentially the same over this time period, this table suggests that higher generation rates are the most influential factor in determining disposal rates when operating under normal economic conditions. Conversely, it is safe to conclude that lower disposal rates under poor economic conditions are driven by lower generation.

Forsyth County has adopted the following waste reduction goal for the planning period July 1, 2012 – June 30, 2022, which takes into consideration the continuation of economic conditions and factors affecting the County’s ability to control its waste stream to fund diversion programs.

- ***By FY June 30, 2022, achieve a disposal rate of 1.20 tons per-capita, which is 10% below the 1988-89 baseline year rate of 1.34 tons per-capita.***

As stated in the 2006 and 2009 updates to the Plan, the potential for attaining these goals would be enhanced by the addition of a construction and demolition waste recycling facility to complement the CCUC’s existing C & D waste management facility at Old Salisbury Road Landfill. In January 2011, a new C&D recycling facility began operations in Forsyth County. Abbey Green, a privately owned company, is permitted as a transfer, recycling, resource recovery, and processing facility and is permitted to receive 425 tons of C&D waste per day. In its first six months of operation, the Abbey Green facility reported receiving 9,469 tons of C&D waste, of which 68.4% (6,479 tons) was recycled.

It is estimated that the combination of the new government contracted single-stream recycling programs throughout the County and the Abby Green C & D Recycling Facility will contribute most, if not all, diversion to attain this goal.

**Per-Capita Disposal FYE 2002 to 2011**

<b>Fiscal Year Ending</b>	<b>Tons Per Capita</b>	<b>% Change From BL Year</b>
1989 (Baseline Year)	1.34	-
...	...	...
2002	1.44	7.46%
2003	1.59	18.66%
2004	1.73	29.10%
2005	1.62	20.90%
2006	1.67	24.63%
2007	1.68	25.37%
2008	1.5	11.94%
2009	1.2	-10.45%
2010	1.22	-8.96%
2011	1.17	-12.69%

**Table ES-3**

### Per-Capita Disposal FYE 2002 to FYE 2011

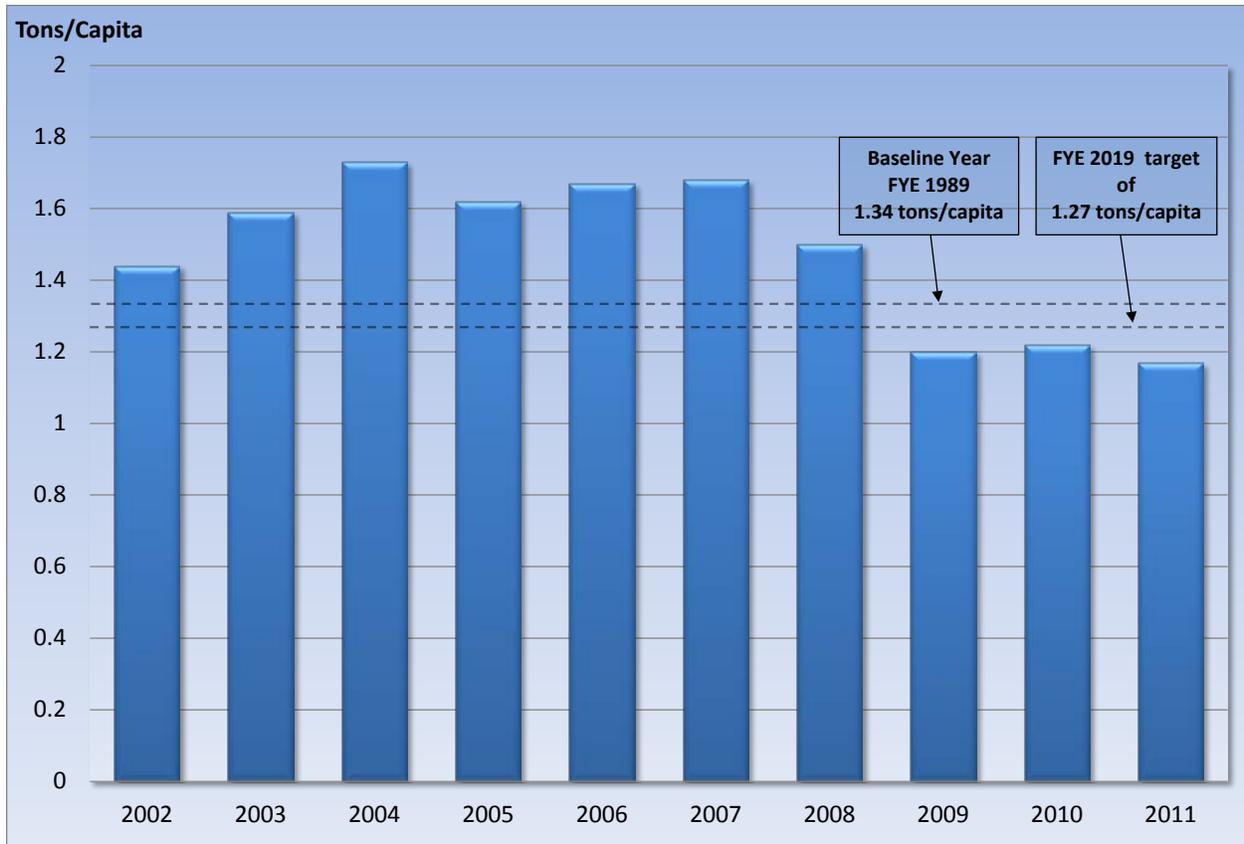


Figure ES-1

# 1 THE PLANNING PROCESS

## 1.1 Background

The City/County Utility Commission (CCUC) is a joint agency of the City of Winston-Salem and Forsyth County. Its members are appointed by members of the Winston-Salem City Council and the Forsyth County Board of Commissioners. Created in 1976 to govern and set policy for water and wastewater services for the City of Winston-Salem and Forsyth County, in 1990 it was given responsibilities over solid waste disposal services. CCUC staff<sup>1</sup> provide solid waste services, both directly and indirectly through contractors, to the City of Winston-Salem, other municipalities, Forsyth County and the region. Staff in the Solid Waste Section of the Utilities Division prepared this Solid Waste Management Plan. The following local governments participated in the development of this Plan:

- Bethania
- Clemmons
- Kernersville
- Lewisville
- Rural Hall
- Tobaccoville
- Walkertown
- Winston-Salem
- Forsyth County

On Thursday, January 19, 2011, the CCUC held a kickoff meeting for the Solid Waste Planning Process during which Mr. Jason Watkins and Mr. Charles Gerstell, both from the Division of Waste Management (DWM), provided a brief overview of the process and answered questions asked by representatives from the planning jurisdictions. Representatives from nearly all jurisdictions attended this meeting.

Each local government listed above is responsible for managing waste within its respective jurisdiction and has cooperated in the preparation of this 10 Year Solid Waste Management Plan. The original Plan, developed in 1997 in accordance with N.C. General Statute 130A-309.09A(b), was revised in 2000, 2003, 2006 and 2009. This is the fifth update to the Plan and covers the planning period from July 1, 2012 – June 30, 2022. In addition to the participants, the following organizations provided information for this Plan:

- NC Division of Waste Management
- NC Division of Environmental Assistance and Outreach
- Keep Winston-Salem Beautiful
- Private MSW hauling companies and disposal facilities

Public comment was also solicited, accepted and considered in developing the Plan. The CCUC held a public meeting during its regularly scheduled meeting on May 14, 2012 to accept public comment on the Plan. The meeting was advertised in three local newspapers, the Winston-Salem Journal, the Chronicle and Que Pasa, through the City of Winston-Salem's internet site and on

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<sup>1</sup> CCUC staff are employees of the City of Winston-Salem Utilities Division. References to CCUC staff and Solid Waste staff are synonymous and the terms are used interchangeably throughout this document.

cable television Channel 13. (See Appendix A for the Public Meeting Notice.) Comments were received during the meeting and accepted by CCUC staff in writing following the meeting. Prior to this meeting, draft copies of the Plan were made available for public review and comment in the CCUC Administrative Office, the Forsyth County Main Library, and all offices of the eight municipalities. There was one public comment received on the Plan in the form of a letter and is included in Appendix A-2. The final Plan was submitted to and approved by the governing boards of all Plan and the CCUC. See Appendix B for copies of the Resolutions adopting the Plan.

## 1.2 Vision

The long-term vision for the County's solid waste management programs is to be comprehensive in nature, environmentally sound, efficient and effective.

The publicly operated collection programs will provide the best service possible within the financial constraints of publicly funded budgets. Publicly operated disposal facilities will utilize the best technology possible to protect the environment and maximize the life of any capital investments while providing for disposal services to meet the needs of the service area. Governments that contract for collection and disposal services will strive to insure that those services are provided in a manner consistent with their public counterparts.

Reduction and recycling efforts will be utilized in order to increase the long-term disposal capacity for the area. These efforts will attempt to address the large, non-residential portion of the waste stream through education and support to area businesses. These goals will be pursued in a professional and financially responsible manner to ensure that they are met using a well-planned and organized approach while maintaining competitive prices for the services provided. Alternatives to the current approaches have been considered and will continue to be considered in an attempt to continually improve existing systems from both a technical and policy perspective. As an example, in 2010, the City Council of Winston-Salem and the Forsyth County Board of Commissioners both adopted resolutions directing the City/County Utility Commission to engage appropriate experts to bring forward recommendations to improve solid waste management programs. The goal of this comprehensive study was: "To develop recommendations for a solid waste management system that will provide a seamless, comprehensive, and cohesive approach to solid waste management and will provide a best in class solution to solid waste management issues for the citizens of Winston-Salem and Forsyth County."

The consulting firm of R.W. Beck was selected for this work, and delivered a report in December 2010. In that report, best practices were presented and described in terms of organizational structures that could potentially be implemented to address the challenges identified. The report, which can be reviewed in its entirety by clicking [HERE](#), included recommendations related to management, policy, and financing mechanisms for disposal, collection and waste reduction programs. The report drew a general conclusion that there is no single entity in Winston-Salem and Forsyth County responsible for comprehensive solid waste management policy, and that it would be beneficial to consider taking steps toward creating one.

More specifically, the report recommended that we implement a system in the near term that takes advantage of the unique position of an existing and successfully implemented joint agency.

This would mean that the CCUC would continue operating the facilities it currently operates, but would also formally accept broad strategic planning responsibilities. The goal, as stated on page ES-3 in the executive summary of the report, is to administer an integrated solid waste management system that would include responsibility for:

- ensuring long-term disposal capacity;
- establishing goals and priorities for waste reduction and recycling;
- determining if and when to solicit alternative technology proposals;
- providing guidelines for consistent residential recycling programs throughout the County;
- implementing a consistent program for collection of solid waste and recyclables from businesses in the County.

The report further recommended consideration of an independent Solid Waste Authority, involving the City, County and other local governments that wish to participate. Such an Authority would have financing mechanisms and legal authorities available to it that individual governments may not. The transition to a separate Authority, if deemed appropriate, could occur over a longer term period, perhaps 5-10 years in the future. This would allow the Authority to become established prior to tackling the challenging task of raising capital for, and deciding upon, the next disposal option (after Hanes Landfill is complete.)

The CCUC accepted and endorsed the concepts presented in the R.W. Beck report. One of the action steps identified is the formation of a citizen's advisory group that would allow stakeholders to have input into any proposed programmatic changes. The creation of such an advisory group may be considered in the future.

### **1.3 Objectives**

The purpose of this planning document is to guide the Plan participants in realizing their vision by meeting the following solid waste management objectives:

- To provide for the long-term management of the County's solid waste effectively and efficiently
- To protect the public health and the environment; and operate all facilities in compliance with all applicable requirements
- To provide waste collection services; or otherwise ensure they are provided wherever appropriate
- To provide education and support for waste reduction activities, including composting, recycling, and other resource recovery and conservation efforts
- To establish local solid waste reduction goals and facilitate achieving them

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## 2 PLANNING AREA PROFILES

### 2.1 Geographic, Economic and Demographic Profile

The planning area covers all of Forsyth County, which includes the unincorporated areas, as well as the municipalities of Bethania, Clemmons, Kernersville, Lewisville, Rural Hall, Tobaccoville, Walkertown and Winston-Salem. Appendix C-1 contains a map showing the planning area, the geographic distribution of the municipalities within the county and the major permitted solid waste facilities in the county. The distribution of the population, households and employers within the County plays an important role in determining where most of the solid waste is generated as well as how services can be efficiently provided.

Forsyth County is located in north-central North Carolina and covers 412.8 square miles of land area. Municipalities occupy 195.8 square miles or 47.4% of the total county area. The remaining area is unincorporated.<sup>2</sup>

Average annual employment in Forsyth County in 2010 was 158,507. Based on average employment, the three largest employment sectors are health care and social assistance (18.8%), retail trade (10.9%) and manufacturing (10.7%).<sup>3</sup> Table 2-1 shows the ten largest employers in the planning area. Taxable sales in the county in FYE 2011 were \$3.9 Billion.<sup>4</sup>

**10 Largest Employers, CY 2011<sup>5</sup>**

Business Name	Business Sector	Number of Employees
Wake Forest Baptist Medical Center	Health Care/Education	12,837
Novant Health	Health Care	8,145
Winston-Salem/Forsyth County Schools	Education	6,692
Reynolds American	Tobacco Products	3,000
Hanesbrands	Marketing and Sales	2,800
Wells Fargo	Financial Services	2,800
City of Winston-Salem	Government	2,660
BB&T	Financial Services	2,200
Forsyth County	Government	2,029
Wake Forest University	Education	1,680

**Table 2-1**

Forsyth County's total estimated population on July 1, 2010 was 351,798. Between 2000 and 2010, the County grew at an annual rate of 1.5%. Table 2-2 shows population estimates for each Forsyth County jurisdiction. According to the U. S. 2010 Census there were 156,872 housing

<sup>2</sup> Winston-Salem/Forsyth County Planning Department, internal email correspondence, March 2009. The incorporated municipalities of King (Stokes Co.) and High Point (Guilford Co.) extend into Forsyth County.

<sup>3</sup> Winston-Salem and Forsyth County in 2012, Winston-Salem Chamber of Commerce, September 2011

<sup>4</sup> North Carolina Department of Revenue Statistical Abstract of Taxes.

<sup>5</sup> Winston-Salem and Forsyth County in 2012, Winston-Salem Chamber of Commerce, September 2011.

units in Forsyth County with 141,163 of them being occupied.<sup>6</sup> Forsyth County is the fourth most populous county in North Carolina.

**Estimated Populations by Jurisdiction, July 2010**

<b>Jurisdiction</b>	<b>Population</b>
Winston-Salem	230,345
Unincorporated Area	55,892
Kernersville (Part)	23,147
Clemmons	18,688
Lewisville	12,681
Walkertown	4,691
Rural Hall	2,947
Tobaccoville	2,449
King (Part)	621
Bethania	329
High Point (Part)	8
<b>Forsyth County Total</b>	<b>351,798</b>

**Table 2-2**

**2.2 County Waste Management Profile**

Table 2-3, on the following page, provides details that show the total amount of solid waste generated, disposed, recycled, composted/mulched, or otherwise managed in Forsyth County for FYE 2011. In FYE 2011, approximately 490,427 tons of solid waste were generated in Forsyth County. This is equivalent to 1.39 tons per-capita per year, based upon the July 1, 2010, population estimate for Forsyth County. Nearly 84% of waste generated was disposed. Of the 410,934 tons that were disposed, 361,727 tons, or 73.8%, were MSW. C & D was the second largest category of waste disposed at 49,207 tons, or 10% of the total. Recycling, recovery and composting account for the difference in the amount of waste generated and disposed. In FYE 2011, there were 79,493 tons, or 16.2% of the total generated, managed through recovery programs. A total of 23,396 tons were recycled or recovered through various government-sponsored programs. Curbside and drop-site recycling programs managed a total of 16,094 tons. The remainder was recovered white goods, tires, pallets and other wood waste and e-waste. Abby Green in Forsyth County and WCA of High Point, both C & D waste recycling facilities, recovered a total of 6,557 tons of C & D waste from Forsyth County in FYE 2011. Compost programs accounted for the largest amount of recovered materials. Approximately 49,286 tons of yard waste were managed through four separate government programs in the county. Lastly, 254 tons of HHW were collected at The Enviro-Station, the county’s HHW collection and processing center. The graph in Figure 2-1 summarizes 10 years of solid waste data for Forsyth County showing the total amounts generated, disposed and recovered for each year.

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<sup>6</sup> US Census Bureau Website, Census 2010, Demographic Profile for Forsyth County, NC.

## Solid Waste Management Methods

Facility/Program	Tons	% of Category	% of Total	Tons Per Cap
<b>MSW Disposed</b>				
Hanes Mill Rd. Landfill	208,547	57.7%	42.5%	
Uwharrie Env. Regional Landfill	90,183	24.9%	18.4%	
BFI-Charlotte Motor Speedway Landfill	62,222	17.2%	12.7%	
U. S. Tire Monofill	642	0.2%	0.1%	
WI-Sampson County Landfill	78	<0.1%	<0.1%	
Palmetto Landfill, SC	25	<0.1%	<0.1%	
GDS Recycling to unknown LF	23	<0.1%	<0.1%	
Richland LF	7	<0.1%	<0.1%	
<b>Total MSW Disposed</b>	<b>361,727</b>	<b>100.0%</b>	<b>73.8%</b>	<b>1.03</b>
<b>C &amp; D Disposed</b>				
Old Salisbury Rd. C & D Landfill	45,921	93.3%	9.4%	
A-1 Sandrock C & D Landfill	2,219	4.5%	0.5%	
WCA of High Point C & D Landfill	1,052	2.1%	0.2%	
Red Rock Disposal	15	<0.1%	<0.1%	
<b>Total C &amp; D Disposed</b>	<b>49,207</b>	<b>100.0%</b>	<b>10.0%</b>	<b>0.14</b>
<b>Total Disposed</b>	<b>410,934</b>	<b>100.0%</b>	<b>83.8%</b>	<b>1.17</b>
<b>Recycled/Recovered</b>				
Curbside/Drop Site Programs	16,094	68.8%	3.3%	
Tires	5,782	24.7%	1.2%	
Pallets/Other Wood	1,161	5.0%	0.2%	
White Goods	351	1.5%	0.1%	
E-waste	8	0.0%	<0.1%	
<b>Total Recycled/Recovered</b>	<b>23,396</b>	<b>100.0%</b>	<b>4.8%</b>	<b>0.07</b>
<b>C &amp; D Recoverd</b>				
Abby Green	6,233	95.0%	1.3%	
WCA of HP	325	5.0%	0.1%	
<b>Total C &amp; D Recovered</b>	<b>6,557</b>	<b>100.0%</b>	<b>1.3%</b>	<b>0.02</b>
<b>Composted</b>	<b>49,286</b>	<b>100.0%</b>	<b>10.0%</b>	<b>0.14</b>
<b>Other (HHW)</b>	<b>254</b>	<b>100.0%</b>	<b>0.05%</b>	<b>&lt;0.01</b>
<b>Total Recovered/Recycled</b>	<b>79,493</b>	<b>100.0%</b>	<b>16.2%</b>	<b>0.23</b>
<b>Total (Generation)</b>	<b>490,427</b>	<b>100.0%</b>	<b>100.0%</b>	<b>1.39</b>
<b>Population</b>	<b>351,798</b>			

Table 2-3<sup>7</sup>

7 NC DENR Solid Waste Annual Facility Reports, FYE 2011 for all named, permitted facilities. Data from programs was obtained from internal CCUC reports.

## Solid Waste Reported, Disposed and Recovered FYE 2002 to 2011



**Figure 2-1**

### 2.3 Municipal Waste Management Profile

Every local government in Forsyth County is either directly or indirectly, through contractual arrangements with private waste haulers, responsible for the collection, transportation and disposal of *residential* solid waste. Table 2-4 shows the amounts of residential waste directly or contractually managed by local governments in FYE 2011. Nearly all of this waste is from residential sources and collected on residential routes. Both the City of Winston-Salem and the Town of Kernersville provide some commercial waste collection services within their respective jurisdictions using front loader vehicles, which is excluded from this discussion<sup>8</sup>.

Municipalities in Forsyth County managed 152,669 tons of residential solid waste in FYE 2011. Almost 93,000 tons, or 61%, were disposed in landfills. Almost 60,000 tons, or 39.1%, were diverted through recycling and composting programs. The unincorporated areas of Forsyth County contributed an additional 10,800 tons of residential waste disposal through its franchised haulers.

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<sup>8</sup> Although residential in nature, waste collected from multi-family units is often classified as commercial because it is collected in front loader trucks along with other business generated waste.

## Residential Solid Waste Managed by Forsyth County Municipalities<sup>9</sup>

Municipality	Disposed		Recycled		Composted		Total Diverted		Total Tons Managed
	Tons	%	Tons	%	Tons	%	Tons	%	
<b>Bethania</b>	130	75.8%	41	24.2%	0	0.0%	41	24.2%	171
<b>Clemmons</b>	5,687	52.9%	1,090	10.1%	3,976	37.0%	5,066	47.1%	10,753
<b>Kernersville</b>	5,107	46.5%	1,732	15.8%	4,141	37.7%	5,873	53.5%	10,980
<b>Lewisville</b>	3,761	85.3%	649	14.7%	0	0.0%	649	14.7%	4,410
<b>Rural Hall</b>	650	69.3%	138	14.7%	150	16.0%	288	30.7%	938
<b>Tobaccoville</b>	819	90.3%	88	9.7%	0	0.0%	88	9.7%	907
<b>Walkertown</b>	1,933	93.5%	135	6.5%	0	0.0%	135	6.5%	2,068
<b>Winston-Salem</b>	74,882	61.2%	10,565	8.6%	36,994	30.2%	47,559	38.8%	122,441
<b>Totals</b>	92,969	60.9%	14,439	9.5%	45,261	29.6%	59,700	39.1%	152,669

**Table 2-4**

It is commonly estimated that 67% of all waste in large industrial centers like Forsyth County originates in the commercial, industrial and institutional (CII) sector of the economy. Applying this percentage to the total tons generated in Forsyth County (from Table 2-3) yields an estimated CII waste stream of 323,649 tons in FYE 2011. Subtracting the residential tons managed from Table 2-4 above from the total amount of waste reported in Table 2-3 yields a slightly different estimate for waste from the CII sector. [490,377 tons – 152,699 tons = **337,708 tons**] The difference of 14,059 tons is relatively minor even considering that some of the waste included in Table 2-4 above is from small businesses in the CII sector, collected and reported by the City of Winston-Salem and the Town of Kernersville. The difference in these two approaches was over 70,000 tons in FYE 2008 suggesting that the economic downturn has impacted the CII sector much more than the residential.

Municipalities in Forsyth County are doing a very good job of diverting *residential* waste from disposal and reducing their respective *residential* per-capita disposal rates. Table 2-5 below shows the per-capita disposal rate for each municipality in the planning area. As indicated, some municipalities do better than others in waste diversion but most importantly, all of these disposal rates are well below the target goals set by the state or for the planning area as a whole. The huge difference between the 0.31 tons per-capita disposal rate for all municipalities and the 1.17 tons per-capita for Forsyth County suggests that a much greater emphasis needs to be placed on CII sector recycling and diversion programs in order to make progress in attaining our goals. Unfortunately, most CII waste is collected and disposed by private hauling companies because the waste requires special handling and equipment that municipalities do not provide (e.g. compactors, roll-off containers). Impacting this waste stream with government diversion programs will be challenging, and would likely require an ordinance-based approach that involved mandatory recycling and/or flow control.

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<sup>9</sup> Residential waste only; some small business waste may be included. Solid Waste Management Annual Reports for FYE 2011, for all named municipalities and CCUC internal reports for Winston-Salem.

**Residential Disposal Rates  
For Municipalities in Forsyth County<sup>10</sup>**

<b>Municipality</b>	<b>Tons Disposed</b>	<b>Estimated Population</b>	<b>Disposed Per Capita</b>
<b>Bethania</b>	130	329	0.40
<b>Clemmons</b>	5,687	18,688	0.30
<b>Lewisville</b>	3,761	12,681	0.30
<b>Kernersville</b>	5,107	23,147	0.22
<b>Rural Hall</b>	650	2,947	0.22
<b>Tobaccoville</b>	819	2,449	0.33
<b>Walkertown</b>	1,933	4,691	0.41
<b>Winston-Salem</b>	74,882	230,345	0.33
<b>Totals</b>	92,969	295,277	0.31

**Table 2-5**

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<sup>10</sup> Residential waste only; some small business waste may be included. Tonnages from Annual Solid Waste Management Reports, FYE 2011, for all named municipalities and from CCUC internal reports for Winston-Salem.

## 3 WASTE STREAM EVALUATION

### 3.1 Waste Stream Characterization Study

The most recent waste characterization study was conducted in February 2007. The goal of the study was to identify major waste types from residential and commercial sources and to determine the quantity and composition of the wastes from each source. MSW at Hanes Mill Rd. Landfill and C & D waste at Old Salisbury Road Landfill were evaluated separately. Data from this study is presented in Appendix D.

Since a significant portion of Forsyth County's waste was collected at the source by private haulers and delivered to private landfills for disposal during the time this study was conducted, the characterization of those waste streams was unable to be determined. The more specialized nature of the collection services provided by the private haulers suggests that those waste streams are more commercial/industrial in nature, so no extrapolation based on the characterization study conducted at Hanes Mill Road Landfill was performed. Therefore, the data presented in Appendix D is exclusive of any waste taken to privately operated landfills.

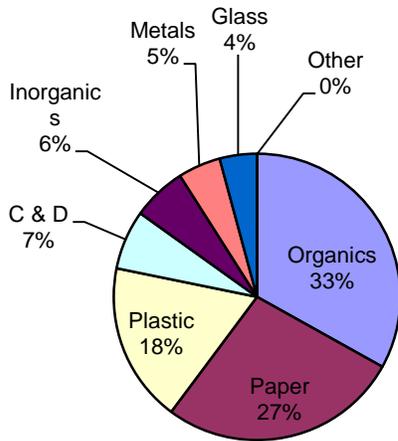
Organics (33%) make up the largest category of the residential waste stream at Hanes Mill Road Landfill. Paper (27.1%) followed by plastic (18%), together with organics, represents more than 78% of the total amount of waste received at Hanes Mill Road Landfill. Food waste (17.4%), other paper (9.6%) and film plastic (9.2%) are the largest subcategories of waste received. Refer to Figure 3-1.

Likewise, in the commercial waste stream at Hanes Mill Road Landfill, organics (30.4%), paper (28.9%) and plastic (14.4%) are the three largest categories of waste received, making up nearly 74% of the total. Food waste and film plastic make up 12.5% and 6.3% of their respective categories. However, cardboard, as opposed to other paper in the residential waste stream, is a larger component of the commercial waste stream. Refer to Figure 3-2.

Non-treated wood (19.7%), asphalt shingles (10.9%) and non-reinforced concrete (10.4%) make up the three largest categories of waste received at Old Salisbury Road C & D Landfill. Together these three categories make up 41% of the total C & D waste stream. All three of these wastes have strong recycling markets making them good candidates for removal in a C & D waste recycling program. Cardboard (8.5%) also makes up a significant portion of the C & D waste stream and is another material with a strong market. Refer to Figure 3-3.

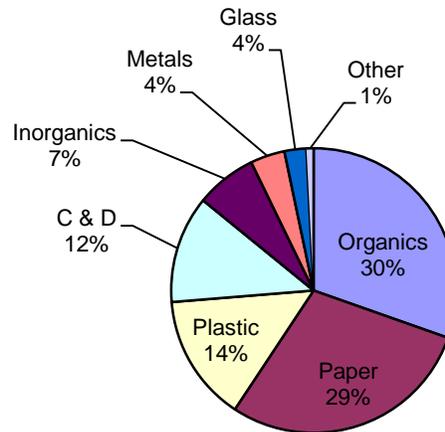
## Waste Stream Characterization Study Summary

**Residential Waste**



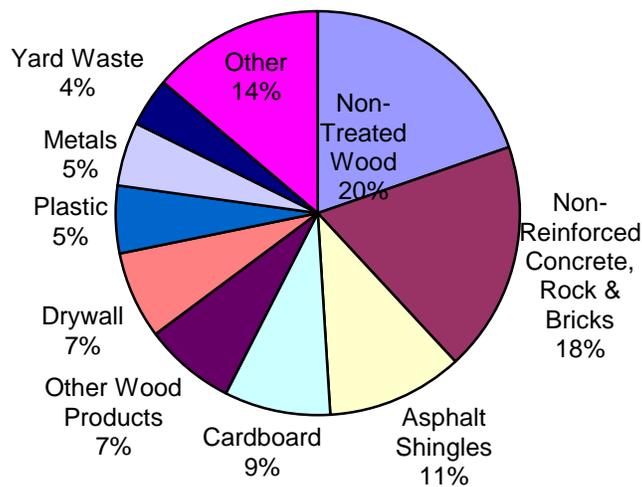
**Figure 3-1**

**Commercial Waste**



**Figure 3-2**

**C & D Waste**



**Figure 3-3**

## 4 WASTE REDUCTION GOALS AND PLAN

### 4.1 Background

The Solid Waste Management Act of 1989, as amended by HB 1109 in 1991, and embodied in NCGS 130A Part 2A, established the following waste reduction goals for the State of North Carolina:

- Twenty-five percent (25%) reduction by June 30, 1993
- Forty percent (40%) reduction by June 30, 2001

These are State goals designed to be achieved collectively by all local governments in North Carolina through the efforts of their individual waste reduction programs. The *reduction* referred to in the statute applies to waste disposed, incinerated, converted to tire-derived fuel or converted to refuse derived fuel. Subsequent legislation and amendments have created several key statutes affecting the attainment and reporting of these goals. Among them are:

*NCGS § 130A-309.04(c) It is the goal of this State to reduce the municipal solid waste stream, primarily through source reduction, reuse, recycling, and composting, by forty percent (40%) on a per-capita basis by 30 June 2001.*

*NCGS § 130A-309.09A(b) Each unit of local government, either individually or in cooperation with other units of local government, shall develop a 10-year comprehensive solid waste management plan. Units of local government shall make a good-faith effort to achieve the State's forty percent (40%) municipal solid waste reduction goal and to comply with the State's comprehensive solid waste management plan. Each unit of local government shall develop its solid waste management plan with public participation, including, at a minimum, one advertised public meeting. The Department shall assist units of local government in the preparation of the plan required by this subsection if the unit of local government requests assistance. Each plan shall be updated at least every three years. In order to assure compliance with this subsection, each unit of local government shall provide the Department with a copy of its current plan upon request by the Department. Each plan shall:*

*(2) Include a goal for the reduction of municipal solid waste on a per-capita basis by 30 June 2001 and a goal for the further reduction of municipal solid waste by 30 June 2006. The solid waste reduction goals shall be determined by the unit or units of local government that prepare the plan, and shall be determined so as to assist the State, to the maximum extent practical, to achieve the State's forty percent (40%) municipal solid waste reduction goal as set out in G.S. 130A-309.04(c).*

Under normal economic conditions, North Carolina was unable to achieve any of the waste reduction goals contained in these statutes. Although the waste reduction goals are statewide in scope, local governments are required to establish their own goals that will assist the State in attaining the statewide goal and to report those goals and progress toward meeting them in a 10 Year Solid Waste Management Plan to be updated every three years. Local governments are to establish and measure the progress in attaining their goals against the baseline year of FY 1991-92,

or an alternate year if approved by the State<sup>11</sup>. There is no statutory requirement to establish waste reduction goals beyond June 30, 2006, however, the Division of Waste Management still requires Counties and Municipalities to establish waste reduction goals and publish them in their respective Solid Waste Plans.

Many factors have an effect on waste generation and disposal. Local and State authorities recognize that circumstances arise over the course of time affecting the per-capita waste generation and disposal rate that may bear little relationship to the extent to which businesses, institutions and residents make progress in implementing waste reduction programs. Increased waste generation due to hurricanes and other natural phenomena, growth in construction starts, establishment of new manufacturing facilities, and an overall increase in the health of the economy are just a few examples. As a case in point, in the current economic downturn, one of the most noticeable effects in the waste management industry is the significant decrease in C & D waste disposal. CCUC waste disposal facilities have seen waste declines never before experienced since record keeping began. Another factor influencing waste disposal quantities is tipping fees. Competition from private waste companies operating in Forsyth County forces the CCUC to keep disposal fees at its facilities lower than they might be otherwise, thus encouraging disposal. Disposal fees at all of its facilities are below the State average cost of disposal of approximately \$40.<sup>12</sup> The low cost of disposal, relative to the cost of other forms of waste management, also encourages disposal.

In addition to the tangible factors that influence the flow and disposal of waste, it has become increasingly difficult to determine the actual amount of waste disposed by the county because of the complexity and shortcomings of the reporting system. With more waste being reported as transferred out of the county and disposed in the county's name, it has become more important to accurately track the waste that originated within the county. In past years, when most county waste was disposed in the county, CCUC staff relied solely on the Forsyth County Waste Disposal Report prepared by the Division of Waste Management for this data. In recent years, however, CCUC staff has found it necessary to obtain Annual Facility Reports from all facilities that accept Forsyth County waste in order to calculate the amount of waste disposed. Even so, the lack of transparency in reporting by the private sector frustrates local government attempts to confirm the origin of waste delivered to their facilities.

## **4.2 Forsyth County Goals**

Despite the growth of recycling and other waste diversion programs since their inception in the early 1990s, prior to FYE 2009 the County had no success in reducing per-capita waste disposal since its baseline year of 1989 (see Table 4-1). Prior to the current economic downturn that began in 2008, Forsyth County's best year for waste disposal reduction was 1999-00 at 1.40 tons/capita. Its worst year was 2003-04 when waste disposal was 1.73 tons/capita. These volatile changes suggest that population may have less to do with disposal rates than other factors, particularly since Forsyth County's population has grown by only 1.5% annually over the last 17 years.

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<sup>11</sup> Forsyth County was allowed to use FYE 1989 as the baseline year.

<sup>12</sup> N.C. Solid Waste Annual Report, FYE 2011, Department of Environment and Natural Resources, p6.

### Actual Waste Disposal Per-Capita by Year, FYE 1997 to 2011

Fiscal Year Ending	Tons Per Capita	% Change From BL Year	% Change From Previous Year
1989 (Baseline Year)	1.34	-	-
...	...	...	...
1997	1.49	11.19%	-
1998	1.49	11.19%	0.00%
1999	1.49	11.19%	0.00%
2000	1.4	4.48%	-6.04%
2001	1.52	13.43%	8.57%
2002	1.44	7.46%	-5.26%
2003	1.59	18.66%	10.42%
2004	1.73	29.10%	8.81%
2005	1.62	20.90%	-6.36%
2006	1.67	24.63%	3.09%
2007	1.68	25.37%	0.60%
2008	1.5	11.94%	-10.71%
2009	1.2	-10.45%	-20.00%
2010	1.22	-8.96%	1.67%
2011	1.17	-12.69%	-4.10%

**Table 4-1**

Although the disposal rate of 1.17 tons per-capita is the lowest ever recorded and represents a substantial decrease from previous years, it is driven more by lower generation than higher diversion from disposal. It is likely that economic conditions play a much more significant role in this reduction than any programmatic or policy changes implemented by local governments. Table 4-2 reinforces this conclusion by showing that while recovery rates have been very constant for the last ten years generation and disposal rates have varied greatly. The standard deviation for generation (reported) and disposal is more than 6.5 times greater than the standard deviation for recovered. Although the trend of less disposal is expected to continue throughout the remainder of this year, an economic recovery will likely drive generation, and therefore disposal rates, back to previous levels, notwithstanding any programmatic or policy changes targeted at waste reduction, recycling or recovery.

## Waste Reported, Disposed and Recovered Per-Capita

Year	Reported	Disposed	Recovered
FYE 2002	1.64	1.44	0.20
FYE 2003	1.83	1.59	0.25
FYE 2004	1.96	1.74	0.22
FYE 2005	1.82	1.62	0.20
FYE 2006	1.90	1.67	0.21
FYE 2007	1.89	1.68	0.20
FYE 2008	1.70	1.50	0.19
FYE 2009	1.41	1.20	0.21
FYE 2010	1.40	1.22	0.18
FYE 2011	1.39	1.17	0.21
Std Dev.	0.223	0.215	0.018

**Table 4-2**

As one of North Carolina’s largest metropolitan and economic centers, Forsyth County ranks below most of its peer counties in per-capita disposal. Table 4-3 shows the per-capita disposal rates of the 10 most populous counties in North Carolina. Forsyth County ranks seventh which surpasses its ninth place ranking in FYE 2008. Compared to all 100 counties in the State, Forsyth County ranks 88<sup>th</sup> in per-capita disposal, three places above its FYE 2008 ranking. Compared to the State average of 0.87 tons per-capita, Forsyth County’s disposal rate of 1.17 tons per-capita is 35% greater. From its 1988-89 baseline year rate of 1.34 tons per-capita, Forsyth County’s waste disposal has *decreased* by 12.7%

### Waste Disposal Per-capita for North Carolina’s 10 Most Populous Counties<sup>13</sup>

County	Tons Disposed BL Year	Per Cap Disposed BL Year	Tons Disposed FYE 2011	Population July 2010	Per Cap Disposed FYE 2011	Rank
<b>Union</b>	77,842	0.90	177,641	202,592	0.88	1
<b>Buncombe</b>	159,040	0.90	224,529	239,179	0.94	2
<b>Wake</b>	569,622	1.29	911,828	907,314	1.00	3
<b>Durham</b>	218,972	1.17	270,303	268,925	1.01	4
<b>Cumberland</b>	227,302	0.81	357,671	326,673	1.09	5
<b>Guilford</b>	471,541	1.35	566,585	490,371	1.16	6
<b>Forsyth</b>	304,290	1.34	410,934	351,798	1.17	7
<b>Mecklenburg</b>	677,573	1.29	1,089,624	923,944	1.18	8
<b>New Hanover</b>	157,647	1.28	242,013	203,439	1.19	9
<b>Gaston</b>	165,100	0.93	257,428	206,384	1.25	10

**Table 4-3**

<sup>13</sup> North Carolina Solid Waste Management Annual Report, FYE 2011, Appendix, pp. 106-110.

Because of the factors described above and more, it is difficult to predict waste generation and disposal patterns into the future and consequently, it is even more difficult to project and set meaningful, long-term waste reduction goals. The economic downturn and resulting unforeseen large reduction in statewide waste disposal over the last three years is a testament to that fact. Forsyth County's previous attempts at setting and achieving realistic waste reduction goals met with little success. Although NCGS 130A-309.09D(a) gives local governments the authority to implement local solid waste regulatory controls such as mandatory recycling and local disposal bans, the lack of such policies in the planning area will continue to make it difficult to achieve the stated waste reduction goals. Following are the waste reduction goals set in previous Forsyth County Plans.

#### 1997 Solid Waste Management Plan Waste Reduction Goals

- *By June 30, 2001, the per-capita amount of waste diverted by reduction, recycling or other means will total 20% of the total waste stream compared to the per-capita level of the base year of FY 1988/89.*
- *By June 30, 2006, the per-capita amount of waste diverted will total 40% of the total waste stream compared to the per-capita level of the base year.*

As indicated by the figures presented in Table 4-1, Forsyth County did not meet its waste reduction goal for 2001. In the 2000 Plan Update, Forsyth County established what were thought to be more attainable and realistic goals pending completion of a solid waste characterization study and recommendations from the Solid Waste Task Force.

#### 2000 Solid Waste Management Plan Waste Reduction Goals

- *By FY 2005-06 reduce the per-capita solid waste disposal rate by 10%, thereby bringing the waste disposal rate to 5% above baseline levels.*
- *By FY 2009-10, reduce the per-capita solid waste disposal rate by 25%, thereby achieving a per-capita waste reduction rate of 10%.*

CCUC staff reviewed the 2000 goals and, in the 2003 Plan Update and, more in keeping with statutory guidance, restated the new goals in terms of per-capita disposal and reduction from the baseline year of 1989-90.

#### 2003 Solid Waste Management Plan Waste Reduction Goals

- *By FY 2005-06 achieve a disposal rate of 1.41 tons per-capita, which is 5% above the 1988-89 baseline year rate.*
- *By FY 2012-13 achieve a disposal rate of 1.14 tons per-capita, which is 15% below the 1988-89 baseline year rate.*

Partly because of the significant increases in generation and disposal of solid waste from FYE 2000 to FYE 2003, the 2005-06 goal was not achieved. Consequently, the following goals were developed for the 2006 Plan Update.

2006 Solid Waste Management Plan Waste Reduction Goals

- *By FY 2012-13 achieve a disposal rate of 1.42 tons per-capita, which is 6.0% above the 1988-89 baseline year rate.*
- *By FY 2015-16 achieve a disposal rate of 1.40 tons per-capita, which is 4.5% above the 1988-89 baseline year rate.*

Previous Waste Reduction Goal Sheets reported two waste reduction goals – one intermediate goal and a long term 10 year goal. The goal sheets provided by DWM for 2009 and subsequent years requires only one goal to be set ten years from the Plan due date.

2009 Solid Waste Management Plan Waste Reduction Goal

- *By June 30, 2019, achieve a disposal rate of 1.27 tons per-capita, which is 5.0% below the 1988-89 baseline year rate of 1.34 tons per-capita.*

Forsyth County adopts the following waste reduction goal for the current planning period FY 2012 - 2022:

2012 Solid Waste Management Plan Waste Reduction Goal

- *By June 30, 2022, achieve a disposal rate of 1.21 tons per-capita, which is 10% below the 1988-89 baseline year rate of 1.34 tons per-capita.*

Appendix E-1 contains the completed Waste Reduction Goal Sheet for the period covered by this Plan Update. All Forsyth County waste reduction goals are summarized in Table 4-4 below.

**Summary of Waste Reduction Goals**

Plan Year	Goal Date	Tons Per Capita	Percent Change
1997	June 30, 2001	1.07	-20%
	June 30, 2006	0.8	-40%
2000	June 30, 2006	1.41	5%
	June 30, 2010	1.01	-25%
2003	June 30, 2006	1.41	5%
	June 20, 2013	1.14	-15%
2006	June 30, 2013	1.42	6%
	June 30, 2016	1.4	4.50%
2009	June 30, 2019	1.27	-5%
2012	June 30, 2022	1.21	-10%

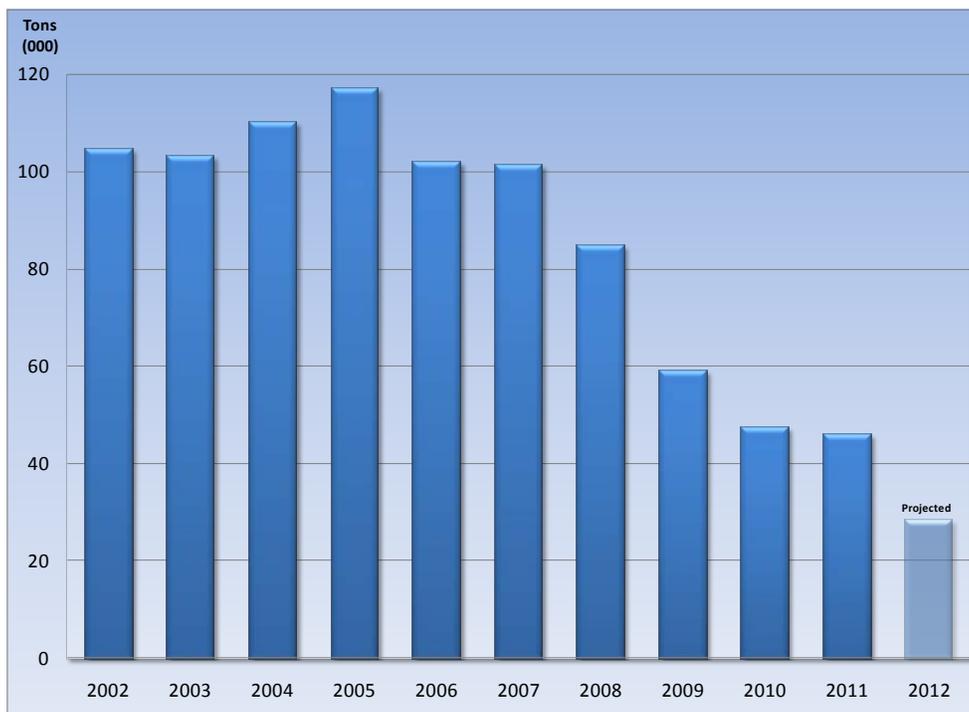
**Table 4-4**

### 4.3 Waste Reduction Plan

In the previous Plan, C & D waste received at CCUC facilities was cited as the greatest potential for recycling to meet our previous waste reduction goal of 1.27 tons per-capita by June 30, 2019. In 2009, the CCUC retained O'Brien Environmental, LLC to study the feasibility of establishing and operating a C & D recycling facility for all the waste received at OSR Landfill. Although the study recommended pursuing the construction of a C & D recycling facility at HMR Landfill in 2018, since the study was completed there have been two important developments that affect the recommendation.

First, there has been a dramatic decline in the amount of C & D waste received at OSR Landfill. In FYE 2008 Old Salisbury Rd. C & D Landfill received 84,880 tons of waste compared to 45,921 tons in FYE 2011. The amount projected to be received by the end of FY 2011-12 is approximately 29,780 tons. Figure 4-5 below shows the amounts of C & D waste received at OSR Landfill over the last 10 years. Such low tonnages greatly reduce recycling potential and makes the economic feasibility of such a project questionable. Second, a privately owned and operated C & D recycling facility has been opened in Forsyth County. In FY 2011, Abby Green, Inc., a private recycling company, opened in Forsyth County with the intent of recycling much of Forsyth County's C & D Waste. The Waste Characterization Study referred to in Section 3 provides valuable insights into which specific C & D wastes are strong candidates for diversion. Abby Green's presence in Forsyth County should provide the same percentage of diversion of C & D Waste that was originally anticipated, but certainly not on the same magnitude of tons. Regardless of the source, whether public or private, C & D recycling remains one of the cornerstones of our waste reduction plan.

**Annual Tonnages at Old Salisbury Rd. C & D Landfill**



**Figure 4-1**

In April of 2012, the City of Winston-Salem implemented its new single-stream, co-mingled, fully-automated, bi-weekly recycling program. This progressive program is expected to make a dramatic difference in the amount of residential materials recycled within Winston-Salem and Forsyth County. All municipalities that are currently using Waste Management, Inc. as their recycling contractor will also implement such a program, helping to further increase recycling. Moreover, Forsyth County will implement such a program on an optional, subscription basis in the unincorporated areas that will create convenient waste reduction opportunities where only drop-off recycling was previously offered. The improved recycling programs in most municipalities and the new recycling program in Forsyth County act as another cornerstone to the waste reduction plan.

## 5 SOLID WASTE PLANNING ELEMENTS

North Carolina's revised Solid Waste Management Act requires local governments to assess the adequacy of local solid waste collection services and disposal capacity to meet current needs and protect human health and the environment, and to take actions as necessary to address identified service or capacity deficiencies. In addition, state law specifies that local governments assess current programs and identify intended actions with respect to:

- source reduction
- collection
- recycling and reuse
- composting and mulching
- waste to energy and related conversion technologies
- transfer of waste outside the planning region
- disposal
- education with the community and through the schools
- management of special wastes
- prevention of illegal disposal and litter management
- purchase of recycled materials and products

Appendix F summarizes some of the key characteristics of the solid waste collection and recovery programs for each jurisdiction in Forsyth County. Each of the various components of Forsyth County's solid waste management system is discussed in detail below, followed by a discussion of intended actions pertaining to each waste management component. It is important to note that all intended actions are subject to budgetary approval and are therefore tentative.

### 5.1 Source Reduction

#### **Current Programs**

Governments within Forsyth County agree that source reduction is an important method for reducing the amount of waste to be managed, although, in many applications, it is a concept that is difficult to translate into specific action steps. Without properly trained staff and adequate funding such programs are difficult to implement. Source reduction programs are also more *generator-active* meaning that otherwise productive labor hours, often in the private sector, would need to be expended on these kinds of programs. Therefore, it is difficult to gain support for such programs in the business community when disposal costs are generally low and much lower than other forms of waste management.

City of Winston-Salem personnel provide information and assistance on junk mail reduction, "enviroshopping," use of non-toxics in homes and businesses and provide support to local groups on these activities. On their website, the City provides a link to the Direct Marketing Association's (DMA) website. The DMA sells names and addresses to direct marketing advertising firms that use 3<sup>rd</sup> class bulk mail as a primary means of print advertising. Through the DMA's [www.dmachoice.com](http://www.dmachoice.com) web page, individuals can request that their names be removed from direct marketing mailing lists thus reducing the amount of junk mail received. Staff from the City of Winston-Salem and the Towns of Kernersville and Lewisville make presentations to community groups and schools to address source reduction. Keep Winston-Salem Beautiful, an

agency partially supported by the City of Winston-Salem, also provides speakers on waste reduction. The Town of Kernersville has implemented a dry-cell battery recycling drop-off program with five sites available to the public to recycle dry-cell batteries. Kernersville also promotes commercial source reduction programs by providing free waste assessments to all local businesses and non-profit organizations and promotes source reduction and other sustainability topics during its annual Earth Day celebration.

To reduce the amount of paper used in printing and copying, the Town of Rural Hall, the Village of Clemmons, and the City of Winston-Salem print all multi-page documents double-sided. Members of the Winston-Salem City Council and the CCUC have been issued electronic devices upon which they can receive their agenda packets digitally, significantly reducing the amount of paper previously used to print lengthy booklets. Rural Hall emails agenda packets to the sunshine list (an email distribution list) and weekly reports to council members. The Town of Lewisville emails its council agendas to council members on a request basis. Kernersville has a buy-recycled policy in place requiring the use of 30% recycled content paper and the use of local sustainable products whenever they are available.

### **Intended Actions**

Although the real application of source reduction activities is limited, CCUC, municipal and county staff continue to investigate them as means to lower the overall disposal rate and achieve our waste reduction goals. Educational activities targeted toward businesses and industries will continue to receive the most attention in the coming years. All local governments are investigating the use of hand-held digital devices for their elected officials to receive and view agendas and other important documents.

## **5.2 Collection**

### **Current Programs**

Solid waste collection in Forsyth County is performed by a number of different organizations. The two largest municipalities, Winston-Salem and Kernersville operate their own collection services while the remaining municipalities contract with private haulers. Using municipal crews, the Town of Kernersville and the City of Winston-Salem collect and transport waste from all single-family and some multi-family homes within their jurisdictions. All other municipalities contract with private waste haulers to collect and dispose of residential waste within their communities. Appendix F contains a description of these programs for each Plan participant. Forsyth County franchises the collection and transportation of residential waste from the unincorporated areas of the county. The Town of Kernersville and the City of Winston-Salem also offer waste collection and transportation service for some commercial customers using dumpsters. Without exception, commercial, industrial and institutional waste generators that require roll-off container service, compactor service or other specialized waste collection services use private waste haulers.

Table 5-1 lists the fourteen private waste haulers in Forsyth County that transport wastes from private individuals or companies to disposal facilities. In addition, some commercial and industrial waste generators haul their own waste to disposal facilities.

## Private Waste Collection Companies Operating in Forsyth County

Company Name	Waste Type Managed
ABC Garbage Service	Residential (Franchised by County)
All Points Waste Services	Commercial/Industrial/C & D
Carolina Disposal	Commercial/Industrial/Residential
Green Day ( <i>Piedmont Paper Stock</i> )	Commercial/Industrial
Kiser's Garbage Service	Residential
McKinney Disposal	Commercial/Industrial/C & D
Locklear's Garbage Service	Residential (Franchised by County)
North State Waste	Industrial/C & D
Piedmont Disposal	Commercial/Industrial/C & D
Republic Waste Services	Commercial/Industrial/C & D
Rural Garbage Service	Residential (Franchised by County)
WCA of High Point	C & D
Waste Industries	Commercial/Industrial/C & D
Waste Management	Commercial/Industrial/C & D /Residential

**Table 5-1**

As shown in Appendix F, residential waste is collected once per week in all of the municipalities. The residents of municipalities that contract with Waste Management, Inc. (WMI) for residential waste collection have curbside, rollout service. The Town of Kernersville has a mandatory curbside rollout waste collection program using 95-gallon containers in which each residence is assigned a serialized rollout cart. Kernersville, Lewisville, Rural Hall and Clemmons offer backyard service for those who can provide documented proof of a medical disability that prevents them from rolling the cart to the street. Tobaccoville offers residents back door waste collection for a fee that is billed directly to the resident by Kiser's Garbage Service. Franchised waste haulers serving the unincorporated areas of the county offer curbside service; backyard service is available at no extra fee for those who can provide documented proof of a medical disability.

The City of Winston-Salem Sanitation Division has transitioned to a mandatory curbside, fully-automated waste collection program. All Winston-Salem residents are provided a 96-gallon rollout container with the serial number on an RFID tag. Currently there are 76,064 participating households. Residents who are not physically capable of moving the cart to the curb or that do not have anyone in the household capable of assisting with the placement of the cart may apply to receive special collections. Currently, there are 2,281 residents receiving this service.

In addition to regular household trash collection, Table 5-2 below shows municipalities that provide bulky item collection for their residents at the frequency shown. Bulky item waste does not typically fit into the regular trash containers used for backyard or curbside collection and includes items like furniture, appliances and tree limbs.

### **Bulky Item Collection Programs by Municipality**

Municipality	Frequency	Type
Clemmons	Annually	Curbside
Kernersville	Quarterly	Curbside
Lewisville	3 times/year	Drop-Off
Rural Hall	Weekly	Curbside
Tobaccoville	Annually	Curbside
Winston-Salem	Semi-annually	Curbside

**Table 5-2**

Lewisville also provides three vouchers each fiscal year for its residents to take bulky items to Hanes Mill Road Landfill and the City of Winston-Salem provides its citizens two such permits. Kernersville provides rental dumpster service to homes that have construction and demolition waste, or extra loose or bagged waste. This service has proven very useful for residents who are moving or doing small home renovations and has helped reduce litter in the community.

Forsyth County grants franchises to waste companies to collect and transport residential and small business waste in the unincorporated areas of the county. There are four franchised waste companies providing service in the unincorporated areas of the county at this time, three of which are locally owned. (Refer to Table 5-1) Rural Garbage Service continues to be the largest service provider based on households served with Waste Management, Inc., Locklear’s Garbage Service and ABC Garbage Service following in descending order based on the number of households served. Franchised haulers collected over 10,800 tons of waste from the unincorporated areas of Forsyth County in FYE 2011. The current franchise period is effective through December 31, 2014, with two additional 2-year extensions.

Commercial, industrial and institutional (CII) waste is collected primarily by private waste haulers although some municipalities provide the service using municipal staff. An anomaly of the CII waste stream is that many residential apartments and condominiums are collected as ‘commercial’ waste because the waste from them is co-mingled with other commercial (business generated) wastes. The reason for this is the collection method. Most CII waste is collected using dumpsters or roll-off containers regardless of the designation of the waste stream as commercial or residential. Neither a private or municipal hauler will use a separate collection vehicle to collect the residential and commercial components of the waste stream separately when it is all in the same geographical area and on the same route. Consequently, in some areas and on some routes, residential apartment and condominium wastes are collected and reported as commercial waste.

Commercial and industrial waste collection in Forsyth County is provided in one of several ways. Table 5-1 shows private companies that provide these services.

- By municipal crews serving business customers in Winston-Salem and Kernersville
- By private haulers operating within Forsyth County (including within the boundaries of municipalities) using an open-market collection system
- By a private hauler under contract with one or more of the Forsyth County municipalities

Most commercial/industrial waste generators pay private haulers directly for solid waste collection service. The City of Winston-Salem and the Village of Tobacoville afford some commercial generators the same amount of waste disposal paid for with tax revenues as it does its residential customers. These generators are typically small businesses that do not require dumpster or roll-off service. Any amounts of commercial waste exceeding this limit must be paid for by the generator and collected by a private hauler.

The Town of Kernersville charges all of its commercial customers a bi-monthly fee based on the level of service and size of container they receive. Containers range from 8 cubic yard dumpsters to 95-gallon rollout carts. The town is able to provide these locations with curbside recycling services as well. Corrugated cardboard collection and single-stream recycling are available to all commercial garbage customers that choose to participate for a low fee; co-mingled recycling is collected along the residential routes using 95-gallon blue carts.

The City of Winston-Salem and Town of Kernersville provide commercial collection service with front-end loader trucks using municipal staff. None of the municipalities provide roll off service, and therefore do not serve many of the larger waste generators in their respective jurisdictions. The frequency of collection depends upon the level of service for which the individual businesses have contracted. As is the case in most North Carolina communities, generators of solid waste in quantities unsuitable for collection in 8-cubic-yard or smaller containers (includes some commercial and institutional as well as most industrial waste) must make their own arrangements for solid waste collection. These generators either haul their own waste or contract with a private hauler for collection and disposal service.

### **Intended Actions**

CCUC staff continues to evaluate and discuss providing universal solid waste and recycling collection throughout Forsyth County, including all municipalities. By combining their service agreements into one and considering inclusion of recyclables collection in the same contract, municipalities could possibly lower their per household waste collection rates than if each jurisdiction continues to contract for services independently. Such a system should also serve to reduce illegal dumping, reduce the self-haul traffic and associated handling costs at the Hanes Mill Road Landfill, as well as provide for more efficient collection and better economies of scale in the unincorporated areas. The Town of Kernersville will continue to expand its dumpster leasing and commercial front loader service for both refuse and cardboard on an as needed basis. The Town of Lewisville will begin semi-annual, curbside bulky item collection beginning July 1, 2012.

## **5.3 Recycling**

### ***Residential recycling***

Forsyth County residents who occupy single-family dwellings in incorporated municipalities are provided curbside recycling service through government contracts with private waste management companies. In Winston-Salem and other communities, some multi-family dwellings are offered recycling collection service under these same contracts. The Village of Clemmons also offers recycling services to multi-family communities using either carts or bins. The Town of Kernersville provides curbside recycling services to multi-family units where

rollout containers can be utilized and adequate service vehicle access is present; co-mingled recycling is also provided to multi-family units in centralized locations where curbside service is not possible. The Towns of Lewisville and Rural Hall provide curbside recycling to duplex units and condominiums. Appendix F gives an overview of the types of recycling in each community.

In April 2012, the City of Winston-Salem transitioned to a single-stream, bi-weekly recycling program using the previous recycling program contractor, Waste Management, Inc. The transition to bi-weekly collection is projected to increase the quantity of recyclables diverted from the landfill while lowering the cost of the service by approximately one-third through a reduction in collection costs and increase in commodity revenues. The City of Winston-Salem uses the 'all-bottle' collection system in an effort to increase the amount of HDPE and PET bottles it collects and accepts OCC and residential mixed paper (RMP) (including OMG, chipboard, telephone books, and junk mail) through its curbside and multi-family programs. It also offers cell phone, inkjet cartridge and printer toner cartridge mail-in recycling to its residents. Four municipal programs also collect old magazines (OMG) as a separate paper grade. In addition, the City of Winston-Salem has nine (9) drop-off centers for the collection of old corrugated containers (OCC) located at area fire stations. Kernersville has a similar OCC drop-off program at all Town fire stations and recently added eight OCC convenience sites at local businesses, such as convenience stores and shopping centers, to increase OCC diversion. The Village of Clemmons also provide a central cardboard collection system for their residents and businesses. Lewisville provides a central drop-off location for cardboard cartons for residents who have moved to a new home. The Town of Kernersville utilizes a single-stream curbside collection program that allows for the commingling of all acceptable materials for residential customers and commercial multi-family units. The program accepts rigid plastics and OCC as part of its single-stream program.

There are two staffed recycling drop-off centers located on opposite ends of the county in Kernersville and Pfafftown. These centers are partially funded by the CCUC and Forsyth County and staffed by personnel through a contract with WMI. The CCUC also operates a drop-off recycling center at Hanes Mill Road Landfill that is staffed by CCUC personnel and collection services are performed by WMI under the same contract for the other two drop-off centers. The three existing centers accept all materials collected through the City of Winston-Salem curbside recycling program.

With the exception of Kernersville, which is contracted to take its recyclables to FCR, Inc. in Greensboro, NC, all household recyclables collected through the above programs are taken to the Recycle America Materials Recovery Facility in Forsyth County where the items are sorted and marketed. Thirty-three percent (33%) of the revenue from the sale of recyclables collected through the Winston-Salem program is returned to the City. Revenue sharing arrangements among the other jurisdictions vary. In addition to the curbside recycling and drop-off center programs, residents can participate in the special collection events listed in the following table.

## Special Recycling Collection Events in Forsyth County

Event	Municipality	Frequency
R-Day (fluorescent bulbs, packing peanuts, curbside materials, chipboard, OCC, household and auto batteries, small propane tanks, 6 pack rings & grocery bags).	Lewisville	2-3 times Annually
Christmas OCC & gift boxes	Lewisville	Annual
Electronics Recycling Drive	Kernersville	Annual

**Table 5-3**

The amount of solid waste recovered through government-sponsored recycling programs in Forsyth County in FYE 2011 was 22,235 tons (including white goods, tires, pallets and e-waste), or 4.5% of the entire County waste stream. Appendix G reflects a breakdown of the tonnage of each material type collected by each jurisdiction as reported in the FYE 2011 Solid Waste Annual Reports. There are many variables affecting these figures. Three of these are: the number and types of materials targeted for recovery in each community, the number of households living in multi-family complexes not currently receiving recycling collection service, and the extent to which each community promotes participation in recycling. While such variables limit the extent to which direct comparisons can be made between Forsyth County communities, the substantial difference in per-household recycling rates in unincorporated Forsyth County relative to the incorporated areas is telling: unincorporated residents in Forsyth County do not recycle to the same extent as incorporated residents who receive curbside recycling service. Maximizing recovery of residential recyclables will entail increasing participation, increasing the types of materials collected in some jurisdictions, and capturing more of the materials now targeted by existing recycling programs.

CCUC staff tracks and reviews load inspection sheets from Hanes Mill Road Landfill in an effort to determine companies and other organizations that are disposing of easily recycled materials such as cardboard and pallets. These organizations may be contacted and referred to recycling companies.

### ***Non-residential recycling***

Given that the majority of Forsyth County's waste stream comes from commercial, institutional and industrial (CII) sources, recycling non-residential waste is even more important, from a waste diversion standpoint, than recycling residential waste. However, far fewer public resources are directed at the CII waste stream for waste management in general and recycling in particular.

In 2007, the CCUC was approved to conduct a test project at Hanes Mill Road Landfill where clean loads of concrete, asphalt and brick (CAB) could be delivered at prices much lower than the gate rate. This was done to divert as much CAB to this program in order to crush it and use it in the place of virgin stone and aggregate. Hanes Landfill typically uses over \$100,000 of stone and aggregate each year. A total of 10,249 tons of concrete and brick were received in this program. Some of the material was used as-is after it was delivered. In October and November 2010, approximately 8,000 tons were crushed into recycled concrete aggregate (RCA) of various sizes and used in the place of virgin aggregate for roads and drainage features within the landfill.

The estimated cost savings from this project was \$151,954. In 2010, the test project was given approval by DWM to become a permanent part of the landfill permit.

The City of Winston-Salem continues to extend its curbside recycling program to selected small businesses. There are nearly 766 small businesses participating in this program. Small businesses may participate through a cart-based program. The Town of Kernersville began a full-scale commercial, co-mingled recycling program in 2010 that is available to all businesses for a low container-rental fee. The program uses 95-gallon rollout containers that were purchased through grant funding from NC Division of Environmental Assistance and Outreach (DEAO). The Town also offers free cardboard recycling services to businesses that allow the public to utilize their cardboard dumpsters; public dumpsters at these businesses are labeled as public drop-off sites and are placed in easily accessible areas.

The Town of Kernersville provides OCC recycling services for businesses, a program that was started in 2002 as part of a DEAO Solid Waste Reduction Assistance Grant. Kernersville delivers commercially collected OCC to Sonoco in Winston-Salem. In 2008, the Town received grant funding from DEAO to purchase 16 additional OCC dumpsters for use within the commercial sector to expand this program.

The CCUC budgets approximately \$90,000 and staff time annually for a school recycling program for all schools in the Winston-Salem/Forsyth County (WS/FC) School District. Acceptable materials include cardboard, paper and beverage containers. WMI is under contract with the CCUC to provide collection and recycling services for this program at 85 school campus and support facilities. The program is voluntary and participation varies among schools. Some have strong programs that recycle cardboard, paper and beverage containers. Many utilize only the cardboard and paper components of the program. As new schools are built, the recycling program is expanded to include them. Although weights are not recorded by the contractor, it is estimated that this program diverts as much as 2,000<sup>14</sup> tons/year from disposal.

With assistance from DEAO grant funding, in 2010 the Town of Kernersville started a single-stream recycling program to accommodate the needs of local businesses. The Town publishes an annual Business Recycling and Legislative Guide to assist ABC permitted establishments in creating their own recycling programs. The guide also provides information about landfill disposal bans of pallets, oyster shells, oil filters, and e-waste with advice on how to set up workplace recycling programs, and other key information. In 2011, the Town received additional grant funding to purchase recycling containers to increase away-from-home recycling for its public parks and downtown pedestrian areas, along with purchasing recycling containers for businesses to use to collect recyclables from their public areas and waiting rooms.

Through its contract with WMI, the Town of Rural Hall extends its residential recycling services to churches within the community. This program uses 90-gallon carts instead of the 14-gallon bins.

All Plan participants reported that they have active in-house recycling programs in place.

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<sup>14</sup> Estimate based on data from CIWMB Public School Waste Characterization Study.

## **Intended Actions**

City of Winston-Salem Recycle Today staff intends to evaluate means of increasing the number of multi-family complexes participating in the recycling program. It will also continue to promote and expand its small business recycling program.

To support the new single-stream recycling programs within the County, WMI is building an 80,000 square foot material recovery facility (MRF) that will utilize the latest technology available including optical sorting. WMI has invested approximately \$8 Million in this MRF and it will employ 20 – 25 people at startup. Design throughput is 20 tons/hour or 100,000 tons/year. Through a combination of added materials in the recycling programs and the new technology used at the MRF, a significant increase in waste diversion should be obtained.

As discussed in the 2010 Study of Best Practices for the *Solid Waste Management System Serving Forsyth County* conducted by R.W. Beck, opportunities for recycling of commercially generated waste could be expanded. Examples of best practices identified in that study include requiring (via ordinance) commercial generators to recycle certain components of the waste stream, or otherwise providing incentives to do so. These practices will be considered along with other related initiatives identified in that study.

Kernersville will continue to promote the conversion from 18-gallon bins to carts, in an effort to make the curbside recycling program fully automated; in seven years over 2,000 households have voluntarily leased carts in lieu of bins. Kernersville will continue to expand its commercial OCC collection program. A pallet drop-off has been established to address the October 2009 ban on landfill disposal of pallets; this service will be free for both businesses and residents. The Town of Rural Hall has entered into an agreement with WMI to begin a single-stream, curbside recycling program using roll-out carts. This bi-weekly recycling program is scheduled to begin on July 1, 2012. All churches will also be upgraded from the existing bin-based service to this new cart service. The Village of Clemmons plans to hold two e-waste collection events in the next two years. The Town of Lewisville will suspend its central cardboard collection program once the single-stream, curbside recycling program is implemented.

Under a franchise ordinance adopted February 13, 2012, all households and small businesses in the unincorporated areas will have access to curbside recycling collection through an optional subscription service. This will be biweekly, single-stream collection from a 96-gallon cart. Recycling service is being phased in by the franchise holder, Waste Management of the Carolinas, Inc., over a six-month period, with all households in the county having access to the service by September 1, 2012.

## **5.4 Reuse**

### **Current Programs**

Forsyth County is home to several non-profit reuse organizations such as Habitat for Humanity ReStore, Goodwill Industries and the Shepherd's Center. Several for-profit reuse enterprises in the form of consignment and thrift shops also operate in the community.

ReConnect™, a computer and electronic reuse/recycling program jointly operated by Dell Computer and Goodwill of Northwest North Carolina, allows any computer or related equipment to be taken to any attended Goodwill donation center in almost all western counties in North Carolina. In Forsyth County there are 18 locations participating in the program. Many of the computers and parts are reused when they are sold to Goodwill Store consumers. Unusable parts are recycled.

### **Intended Actions**

The CCUC encourages and supports extended producer responsibility (EPR) and product stewardship (take-back) programs offered by manufacturers for their products. It is the intention of CCUC staff to work with local businesses on reusing packaging and other materials as they work with them on reduction and recycling programs. Staff in the City of Winston-Salem Solid Waste Section and Sanitation Division will evaluate future needs for increasing efforts to encourage source reduction, reuse, and recycling in the business community.

## **5.5 Composting and Mulching**

### **Current Programs**

Composting and mulching programs in Forsyth County manage yard waste composed of grass clippings, leaves, brush and Christmas trees. They also accept wooden pallets in these programs. With the exception of pallets, most materials come from residential sources. See Appendix F for a summary of the characteristics of each municipality's yard waste collection program.

The largest publicly owned compost facility in Forsyth County is the Overdale Yard Waste Facility, followed by the Forum 52 Yard Waste Facility. Wrico Inc. operates both sites under contract with the CCUC, where it processes yard waste and pallets, which are sold for use as compost, mulch or boiler fuel. The City of Winston-Salem Sanitation Division as well as private landscape contractors and other private individuals deliver yard waste to both of these facilities.

The CCUC and the Town of Kernersville accept wooden pallets through their yard waste programs. In FYE 2011, the CCUC accepted 511 tons of pallets that were ground and sold for boiler fuel.

The CCUC also has a permitted leaf compost site on Reynolds Park Road that is operated by Wrico. The City of Winston-Salem has a permitted leaf transfer site on Thirty-Second Street. The Thirty-Second Street site is used exclusively for the temporary storage of leaves collected by the City of Winston-Salem Sanitation Division until they can be transported to the Reynolds Park Rd. Facility. The Forum 52 Facility is permitted for and capable of composting yard waste and leaves.

The Towns of Kernersville and Rural Hall and the Village of Clemmons also operate compost programs. Kernersville holds yearly sales of mulch and leaf compost for the public in the spring to generate revenue for the town. These soil amendment items are produced from yard debris and leaf collection and then managed by Public Works staff.

The City of Winston-Salem, the Towns of Kernersville and Rural Hall offer weekly residential yard waste collection to their citizens. The Village of Clemmons offers residential yard waste collection to its citizens on a schedule that is determined annually. Winston-Salem residents may purchase a 96-gallon yard waste cart for \$65 and pay an annual \$60 fee for weekly yard waste collection service. Kernersville residents may purchase a 95-gallon yard waste cart from the town for a one-time fee of \$60 and an annual service fee of \$60. Rural Hall residents pay a one-time \$70 fee for a 96-gallon yard waste cart; there is no annual fee for this service. Approximately 15,000 households participate in the yard cart program in Winston-Salem and 1,900 households in Kernersville use the yard cart services. In addition, The Winston-Salem Sanitation Division collects brush every 2 weeks from any single-family households that place it at the curb. In FYE 2011, the City of Winston-Salem collected 21,200 tons of yard waste in carts and at the curb. All material collected from this program is taken to the CCUC's Overdale Yard Waste Facility. The Town of Kernersville processed 1,953 tons of yard waste at its facility in FYE 2011. The Village of Clemmons processed 3,741 tons of mixed yard waste.

The City of Winston-Salem, the Towns of Kernersville and Rural Hall and the Village of Clemmons operate seasonal leaf collection programs. In FYE 2011, The City of Winston-Salem collected 11,160 tons of leaves. Leaves from the City of Winston-Salem are taken to either the Reynolds Park Road Leaf site or the Thirty-Second Street leaf transfer site. These leaves are either composted and given away to citizens in the spring and fall or used by the contractor in the production of compost for sale. The leaves in Kernersville, Rural Hall and Clemmons are taken to their respective compost facilities.

The Village of Clemmons and the Towns of Kernersville, Lewisville and Rural Hall and the City of Winston-Salem collect Christmas trees on a seasonal basis for inclusion in their compost/mulch programs.

In the spring of 2011 a new local company, Gallins Family Farms, obtained approval from NCDENR for a Type II composting pilot project and began a food waste collection service. They are collecting food preparation scraps from commercial kitchens (restaurants, etc.) as well as produce waste from grocery stores and plant trimmings from florists. Between May and December 2011, they diverted 122 tons from disposal.

Some Forsyth communities and the Cooperative Extension service have encouraged backyard composting and Grasscycling. The Town of Kernersville has sold home composting bins to its residents for the deeply discounted price of \$15 and has conducted composting and naturoscaping workshops to promote backyard composting.

On October 1, 2009, a provision in HB 1465 banned the disposal of pallets in landfills. The CCUC has in place the necessary resources to enforce this ban adequately at Hanes Mill Road Landfill. Pallets are accepted for recycling at both Overdale and Forum 52 Yard Waste Facilities.

### **Intended Actions**

The Town of Kernersville will continue to promote backyard composting through workshops, public education and outreach. The Town will also continue to mulch, manage and sell the yard waste collected within the community.

## 5.6 Waste-to-Energy Technologies

### Current Program

Waste-to-energy (WTE) facilities are not part of Forsyth County's current waste management program. WTE is not considered by this community to be an economically viable option at this time due to the high capital and operating costs, the lack of flow control, and public opposition. Other emerging technologies that convert waste to energy or other usable products are also considered unproven at this time and unlikely to be economically feasible. However, with increasing costs to site, permit and build new MSW landfills, it is possible that these technologies will become more viable. In particular, a regional approach could provide the economies of scale required to make these types of facilities attractive. In 2009, the CCUC, in cooperation with Mecklenburg County, retained a consultant to conduct a survey of alternate waste conversion technologies, including conventional mass-burn combustion. This report was expanded upon and updated in the Solid Waste Association's 2011 publication titled *Municipal Solid Waste Conversion Technologies* that can be viewed by clicking [HERE](#).

Hanes Mill Rd. Landfill extracts and converts methane gas to electricity under contract with Salem Energy Systems, a wholly owned subsidiary of DTE Biomass. In FYE 2011, the CCUC received over \$150,000 in gas sales and royalties from the contractor on production of 35,394,087 kilowatt-hours (kWh) of electricity. Over 967,000 Million Standard Cubic Feet (MSCF) of methane were extracted representing 529,680 Million British Thermal Units (MMBTU) of energy. Almost 850,000 MSCF were converted to electricity while 118,044 MSCF were flared.

### Intended Actions

Although not technically a waste-to-energy technology, the CCUC is investigating the use of closed out portions of the Hanes Mill Rd. Landfill as a solar photovoltaic (PV) array farm capable of generating a least one megawatt of energy. Several contractors have been contacted who have expressed an interest in undertaking such a project. A mailing list for these contractors and a Request for Expressions of Interest (RFEI) have been developed in anticipation of pursuing this green energy strategy. Currently, the City of Winston-Salem is assessing widening the scope of this project to include all departments and facilities.

There are no plans in the near term to investigate specific WTE or waste conversion technologies as alternative waste management methods in Forsyth County. Future revisions to this Plan may include further consideration of these approaches. As new cells in CCUC operated landfills are filled and closed, LFG extraction and recovery will continue to be implemented.

## 5.7 Transfers Outside Geographic Area

### Current Program

There are two privately owned transfer stations in Forsyth County. Most waste leaving Forsyth County is transferred through the Overdale Road Transfer Station, owned and operated by Republic Services, to their Uwharrie Environmental Landfill in Montgomery County or Charlotte Motor Speedway Landfill in Cabarrus County. A C & D transfer station, owned by

PCM Construction Services, is closed and no longer transfers waste. In FYE 2011, 38% of all Forsyth County waste was disposed in 12 different landfills outside the County. In FYE 2011, the two Republic Services Landfills received 97.4% of waste transferred out of the county while the remaining 10 landfills received only 2.6% of the total. (Refer to Table 5-4.)

Since FYE 2001, there has been a trend of more MSW being transferred and disposed out-of-county. There has been a nearly constant increase in the *percentage* of Forsyth County MSW disposed out-of-county since FYE 2001 with the percentage peaking in FYE 2011. Conversely, there has been a similar decrease in the amount and percentage of MSW disposed in-county. Since FYE 2002, there has been a 40.9% decrease in MSW disposed in-county and an 817% increase in MSW disposed out-of-county. In FYE 2011, in-county disposal was 254,468 tons or 62% of the total and out-of-county disposal was 156,467 tons or 38% of the total. (See Figure 5-1 and Table 5-5.) Most of this increase in out-of-county disposal occurs at Uwharrie Landfill in Montgomery County and BFI/Charlotte Motor Speedway Landfill in Cabarrus County.

### Solid Waste Disposed In-County vs. Out-of-County

Facility	FYE 2011 Tons	Change
<b>Disposed in County</b>		
Hanes Mill Rd. Landfill	208,547	50.7%
Old Salisbury Rd. Landfill	45,921	11.2%
<b>Total Disposed in County</b>	<b>254,468</b>	<b>61.9%</b>
<b>Disposed Out of County</b>		
Uwharrie Env. Regional Landfill	90,183	21.9%
BFI-Charlotte Motor Speedway Landfill	62,222	15.1%
WI - Sampson Co. LF	78	0.0%
Palmetto Landfill, SC	25	0.0%
Richland Landfill	7	0.0%
A-1 Sandrock C & D Landfill	2,219	0.5%
Foothills Environmental Landfill	0	0.0%
Coble's C & D Landfill	-	0.0%
WCA of High Point C & D Landfill	1,052	0.3%
Red Rock Disposal	15	0.0%
GDS Recycling to unknown LF	23	0.0%
U. S. Tire Monofill	642	0.2%
<b>Total Disposed Out of County</b>	<b>156,467</b>	<b>38.1%</b>
<b>Total Disposed</b>	<b>410,934</b>	<b>100.0%</b>

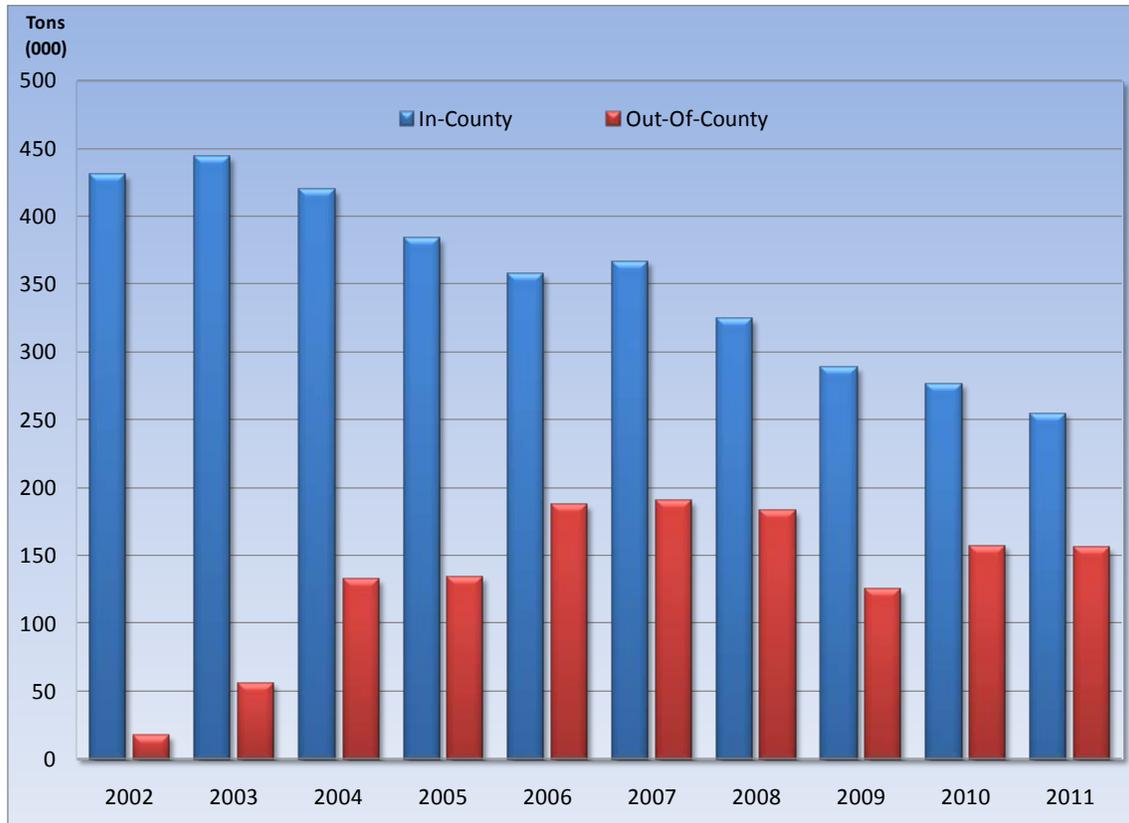
**Table 5-4**

**Solid Waste Disposed In-County vs. Out-of-County<sup>15</sup>**  
**FYE 2002 to 2011**

Fiscal Year	In-County	% In-County	Out-Of-County	% Out-Of-County
2002	430,475	96.2%	16,986	3.8%
2003	443,210	88.8%	55,819	11.2%
2004	419,989	76.1%	131,753	23.9%
2005	384,018	74.1%	134,257	25.9%
2006	357,583	65.6%	187,412	34.4%
2007	366,636	65.9%	189,816	34.1%
2008	324,453	64.0%	182,827	36.0%
2009	287,986	69.8%	124,720	30.2%
2010	276,504	63.8%	156,738	36.2%
2011	254,468	62.0%	155,824	38.0%

**Table 5-5**

**Municipal Solid Waste Disposed In-County vs. Out-of-County<sup>16</sup>**  
**FYE 2002 to 2011**



**Figure 5-1**

<sup>15</sup> Includes MSW & C & D waste.

<sup>16</sup> MSW only, does not include C & D waste.

Construction & Demolition waste is also being transported out of the county for recycling and disposal. WCA in High Point operates a hauling company in the area, which transports most of its collected C & D waste to their recycling facility and landfill in Guilford County. WCA recovers small amounts of C & D waste but most is disposed in their landfill. The chart in Figure 5-1 shows the amounts and percentages of all waste (MSW + CD) disposed in CCUC operated facilities versus all other facilities. The CCUC is now the only operator of MSW and C & D landfills in Forsyth County. This graphic, like the data in Table 5-5, also illustrates how dramatically CCUC facilities are losing market share to private interests that are hauling the waste out of the county.

### **Intended Actions**

None of the local governments participating in this Plan is actively investigating transfer options at this time.

## 5.8 Disposal

### Current Programs

The CCUC operates the State's second largest publicly owned and operated MSW landfill and the tenth largest C & D Waste Landfill, in terms of tons disposed/year in FYE 2011. There is one privately owned transfer station operating in the County for MSW. Much of Forsyth County's waste flows through this facility for ultimate disposal outside the County.

#### *Municipal solid waste*

Hanes Mill Road Landfill is owned by the City of Winston-Salem, operated by the CCUC, and permitted to accept waste from Forsyth, Davie, Stokes, Yadkin and Surry County sources. Currently the only out-of-county waste being received at Hanes Mill Road Landfill is from Stokes County. In FYE 2011, HMR LF received 208,547 tons of solid waste from Forsyth County sources and 12,775 tons from Stokes County sources for a total of 221,322 tons. The amount received annually from Stokes County remains relatively constant although the amount from Forsyth County continues to decline.

Hanes Mill Road Landfill has one closed phase that is under post-closure care. It now operates in a 347-acre expansion site adjacent to the original area. A total of 90 acres of the expansion area will be lined for waste disposal. Waste is currently being disposed in Cells 1 - 4, together consisting of 51.5 acres. The first cell began receiving waste in May 2005. The 90-acre expansion area is projected to reach capacity in approximately 2034, based on current airspace volume, projected in-place densities and assumed incoming waste amounts.

Hanes Mill Road Landfill has Division of Waste Management (DWM) approval to use an alternative daily cover (ADC) called Posi-Shell<sup>®</sup> that aids in reducing the amount of air space consumed by conventional daily cover material (soil). As approved by the DWM, the landfill staff continues to add latex paint, when available, that is screened by the local Household Hazardous Waste (HHW) program contractor, to the Posi-Shell ADC mixture. This seems to aid in adhesion of the ADC mixture to the waste and in deterring disease vectors from being present in the waste. Paint is not always available so some applications of the ADC do not have paint added. In FYE 2011, nearly 64 tons of latex paint were reused in this manner.

There are many positive benefits associated with publicly owned waste management facilities, particularly in having a Subtitle D municipal solid waste landfill. Hanes Mill Road Landfill serves as the cornerstone of an integrated solid waste management program. Having this resources available to serve the solid waste management needs of our community is important for many reasons:

- **We assume responsibility** for the solid waste we generate by providing for its recycling and disposal in Forsyth County. The public sector here does not export our waste to facilities located in other communities.
- **We provide future disposal capacity** for use by our businesses and residents. At current disposal rates, Hanes Mill Road Landfill will serve our disposal needs for well over twenty more years. We have invested tens of millions of dollars in constructed landfill assets that will be available to serve our community in the future. Infrastructure like this

is important for economic development purposes, as well as providing security to existing businesses, institutions and individual citizens.

- **We maintain responsible pricing** for waste disposal. Our rates are established based on actual costs of providing services, and not simply what the market would allow based on competition. As indicated in Table 5-6, our tipping fees are competitive with other landfills in the region, and our presence serves as a stabilizing force in a competitive disposal market.
- **We use a portion of our tipping fee revenues to pay for recycling** programs that serve our residents and businesses. Curbside and drop-off recycling programs, schools recycling, scrap tire, appliances and household hazardous waste programs are all partially funded by the solid waste fund.

**Tip Fee Comparison Among Largest NC Public Landfills**

City	Tipping Fees (Dollars Per Ton) <sup>1</sup>	
	Municipal Solid Waste	Construction and Demolition Waste
Charlotte (Mecklenburg County) <sup>2</sup>	\$27.50	\$39.00
Durham	\$42.50	NA <sup>3</sup>
High Point	\$38.00	N/A
Greensboro <sup>4</sup>	\$41.00	\$31.00
Raleigh (Wake County) <sup>5</sup>	\$32.00/\$38.00	NA
Winston-Salem	\$36.00/\$32.00 <sup>6</sup>	\$30.00

1. A state disposal tax of \$2 per ton is included in all rates.
2. Mecklenburg County has a contract with a privately operated landfill in a neighboring county where it disposes of all its waste.
3. Durham, High Point, and Wake County do not operate construction and demolition landfills.
4. C&D debris is disposed at White Street Landfill at \$31/ton. MSW is accepted at the transfer facility at \$41/ton and transferred to a privately owned landfill in another county.
5. MSW is disposed at South Wake Landfill at \$32/ton. MSW is disposed at the transfer facility at \$38/ton. Loads containing more than 10% cardboard are charged at \$60/ton.
6. \$36.00/ton is the 'gate' rate but customers who deliver 700 tons or more a month are charged \$32.00/ton.

**Table 5-6**

- **Our solid waste system benefits our local economy** - By managing our wastes locally, we are benefiting the local economy by keeping the money we spend on waste disposal - and the jobs required managing our waste - in Forsyth County. As indicated in Table 5-7, Hanes Mill Road Landfill employs 19 people that receive a combined annual compensation of \$645,000. More importantly, the approximately \$7.8 million that it costs to dispose of our waste at the Hanes and OSR Landfills is kept in our local economy. Over the next twenty-five (25) years, this will equal close to \$200 million kept in our local economy. If you considered the other facilities operated by the CCUC, the figures would be even greater.

## Economic Development Benefits of Hanes Mill Rd. Landfill

Parameter	Annual	25 Years
<b>Landfill Size (TPD)</b>	800 TPD	
<b>Landfill Employment</b>		
Direct	18	450
Indirect	1	25
Total	19	475
<b>Landfill Economic Development Benefits</b>		
Total Employee Compensation	645,000	16,125,000
After Tax Income (72%)	464,400	11,610,000
After Tax Income Spent Locally (42%)	195,000	4,875,000
<b>Disposal Dollars Spent Locally (\$34/ton)</b>	\$7,820,000	\$195,500,000

**Table 5-7**

### *Construction and demolition waste*

Old Salisbury Road C & D Landfill is owned by the City of Winston-Salem and operated by the CCUC. It opened in September 1996, replacing the previous Land Clearing & Inert Debris landfill on Overdale Road. The site consists of 140 acres, 56 acres of which are used for waste disposal. The Old Salisbury Rd. Landfill has a remaining life expectancy of approximately 13 years, based on an assumed waste stream similar to last year's. There were 45,921 tons of Forsyth County C & D waste disposed at OSR Landfill in FYE 2011, a decrease of 38,959 tons or 46% from FYE 2008. For FYE 2012, it is expected that the facility will receive less than 30,000 tons.

There are nine private Land Clearing and Inert Debris (LCID) landfills in Forsyth County. These LCID landfills are approved for disposal of unpainted rock, bricks, concrete blocks, concrete, used asphalt, uncontaminated soil and land clearing vegetative debris (stumps, etc.), with some performing varying amounts of wood waste recovery.

### **Intended Actions**

#### *Municipal solid waste*

Forsyth County will continue to need reasonably priced waste disposal for the waste generated within its borders. The CCUC is planning for future disposal needs, and is considering funding options that will allow it to meet all the current operating and capital costs of waste disposal as well as invest money for the construction of a future landfill in the county or region. A financial model is maintained that projects the performance of the solid waste fund balance over the next 20+ years. This model incorporates a capital spending plan that includes funding for the development of a future publicly owned and operated landfill. Because the acquisition and development of an MSW landfill is a lengthy process, potential sites for a future facility are being identified now, so that they can be evaluated and ranked for further consideration.

## *Construction and demolition waste*

There are currently no plans to change the programs and services targeted at C & D waste disposal. Other options are being evaluated in light of the declining waste stream.

## **5.9 COMMUNITY EDUCATION AND OUTREACH**

### **Current Programs**

A variety of recycling educational publications listing the locations of collection centers, acceptable materials and preparation instructions are produced and distributed within the planning area. Presentations are given to civic groups and in public schools and pre-schools by both the City of Winston-Salem and the Towns of Kernersville and Lewisville. Keep Winston-Salem Beautiful (KWSB) and *Recycle Today* (Winston-Salem's contracted recycling program operated by WMI) sponsor the following special educational events:

- Clean and Green School Campus Contest – A major environmental review of Forsyth County Public Schools. KWSB and the Forsyth County Garden Club Council judge schools on their beautification and environmental education programs. 'Clean & Green' flags and certificates are awarded to outstanding schools and exemplary or role model schools also receive engraved plaques and trees.
- Earth Day Celebration – Each April KWSB and the CCUC offer to conduct presentations in Forsyth County schools and other local groups on recycling, litter prevention, composting and environmental education. The purpose is to increase awareness of environmental issues at an early age and to encourage children to appreciate our natural resources. Similar presentations are also conducted throughout the course of the year as requested. KWSB is a system-wide school partner.

City of Winston-Salem and KWSB programs are promoted at community events and fairs. Additionally, video and radio advertising are used to educate the public. The CCUC hosts the North Carolina Governor's School West each year with a tour of Hanes Mill Rd. Landfill.

Kernersville promotes its programs and events through an annual calendar distribution. The Stormwater and Sanitation Divisions work together to create a residential packet of information that contains a magnetic calendar of events, stormwater information, and recycling and solid waste information. This packet is distributed manually to each residence in the fall, and has improved the Town's method of communication with residents immensely and resulted in more efficiency and cost savings.

The Towns of Rural Hall and Lewisville promote waste reduction and recycling in their newsletters that are mailed to residents. The Town of Lewisville also has an active Recycling Committee. The Town of Lewisville participates in the Earth Day celebration by conducting programs at local schools, including Lewisville Elementary, Meadowlark Elementary, Vienna Elementary and Southwest Elementary.

The Town of Kernersville holds an annual Earth Day event focused on environmental issues, including waste reduction, reuse, recycling, and water quality. The event also promotes local

businesses, and sustainability issues. Earth day includes an art contest that invites local school students to submit works of art with an Earth Day theme. The Town also participates in several Town events, such as the Spring Folly and the Honey Bee festivals, to promote recycling, waste reduction, and general education to the public. Representatives from the recycling program set up booths at these events, give out prizes and answer the public's questions. The Town also provides co-mingled recycling services at these events.

One of the primary tools for Kernersville's recycling education efforts has become data gathering and analysis to further increase quality participation in the recycling program. Kernersville continues to develop effective marketing strategies for its recycling program. The recycling program logo is printed on the Town's recycling fleet and on T-Shirts that are distributed at community events.

Many program providers, both public and private, have begun to use the resources of the internet in order to promote their waste management programs and services. The City of Winston-Salem has a quarterly on-line newsletter entitled *Cart and Bin* that is used to educate, promote and encourage appropriate waste management practices. Rural Hall promotes recycling on their town website. The CCUC prints and distributes three outreach publications, one for the Enviro-Station HHW Program, one about the comprehensive services provided by the CCUC and one related to waste disposal and reduction. The CCUC newsletter is published several times a year and frequently features articles about solid waste programs. The CCUC Annual Report also contains detailed information about solid waste management programs. CCUC staff also accepts speaking invitations at a wide variety of organizations and events, and offers tours of its facilities to the public and interested parties.

In addition to purely educational activities at county schools, the CCUC administers and partially funds a comprehensive, voluntary recycling program for the entire Winston-Salem/Forsyth County School District. The CCUC contracts with WMI to collect cardboard, mixed office paper and beverage containers from all the public schools in the county. The program operates on 79 school campuses and at six other support facilities. The CCUC and Forsyth County together spend approximately \$90,000 annually to fund this program and provides administrative services to operate the program. It is estimated that approximately 2,000<sup>17</sup> tons of recyclables are collected through this program each year.

### **Intended Actions**

The CCUC and the City of Winston-Salem consider educating the public and business community on ways to reduce, reuse and recycle to be a high priority, and intend to make recommendations in support of these activities to City staff and the Utility Commission. Additional emphasis will be placed on using internet resources as a means to educate, promote and encourage appropriate waste management practices. The CCUC will update the brochure about waste disposal and reduction for each successive year. Staff will continue to accept invitations to speak at various venues and events, and will continue offering tours of CCUC facilities to a wide variety of interested parties and stakeholders.

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<sup>17</sup> Estimated based on data from CIWMB Waste Characterization Study for Schools.

The Town of Kernersville plans to conduct its participation studies semi-annually and use the data to create targeted education campaigns in areas with low participation rates. Particular attention will be paid to the non-English speaking populations as well as rental properties with high tenant turnover rates. The first of these targeted education campaigns began in the Spring of 2009, in which a control group and experimental group was studied before and after the distribution of targeted recycling promotional materials. Through this study, the Town will be able to see the impacts, if any, of its educational efforts.

## 5.10 Special Wastes

Special wastes include tires, white goods, motor oil and electronic waste (e-waste), all of which are banned from disposal in MSW landfills in NC, and household hazardous waste and abandoned manufactured homes. All special waste programs are operated in partnership with the private sector. The amounts of special wastes being recycled are provided in Table 5-8. Programs for the management of these materials are discussed in the remainder of this section.

### Special Wastes Managed

Waste Material	Amount Recycled
Scrap Tires	5,782 tons
White Goods	351 tons
Used Motor Oil	6,567 gallons
Household Hazardous	244 tons
e-wastes	8 tons

Table 5-8

### 5.10.1 Scrap Tires

#### Current Programs

In North Carolina, discarded, whole, pneumatic, automobile and truck tires are banned from disposal in landfills. In Forsyth County, used tires are accepted at Hanes Mill Road Landfill for either disposal or recycling. All tires on which the North Carolina State excise tax has been paid are accepted free at the landfill. Tires that are considered ineligible for free disposal because they were not assessed the North Carolina excise tax are accepted at a rate of \$82.84/ton for passenger and truck tires and \$184.03/ton for off-road tires. Solid rubber tires are accepted and disposed free at the landfill then charged to the Scrap Tire Grant Program at \$34/ton. All other tires are accepted free and sent for recycling or disposal to U. S. Tire in Concord, NC.

Forsyth County residents are allowed to bring up to five tires per household per year at no charge. Under certain circumstances, Forsyth County property owners are allowed to dispose of more than five tires per year through the Scrap Tire Cleanup Program. Tire clean-ups must be pre-authorized by CCUC staff before property owners bring the tires to the landfill. All commercial scrap tire generators in Forsyth County must submit a Scrap Tire Certification Form to the CCUC before tires will be accepted. Used pneumatic tires received at Hanes Mill Road Landfill are stored in trailers until full then transported to U. S. tire in Concord, NC for processing.

The CCUC's Tire Recycling Program accepted 5,864 tons of used tires in FYE 2011, 82 tons of which were solid rubber tires disposed at Hanes Landfill. The remaining tires were transported to U. S. Tire for recycling/disposal. U. S. Tire estimates that it recycles 85% of all tires transported from Forsyth County and disposes of the rest. Based on this, approximately 4,984 tons of tires were recycled while the remaining tires were disposed in the U. S. Tire monofill.<sup>18</sup> The total cost of managing used tires in FYE 2011 was \$479,624 of which \$447,540 was reimbursed by the State through the Scrap Tire Disposal Tax and Scrap Tire Grant Program.

The Town of Kernersville pays the state tire disposal tax and is not charged for disposal of the approximately 45 tons of waste tires generated annually in-house. Many of Kernersville's tires are retreaded and placed back on the market. Kernersville does not collect or dispose of tires from residents but refers them to the CCUC Tire Recycling Program.

### **Intended Actions**

Because the current used tire collection and management program in Forsyth County appears to serve the citizens well, there are no operational changes planned. The CCUC will continue its attempt to receive 100% State reimbursement for all costs of managing tires.

## **5.10.2 White Goods**

### **Current Programs**

Several municipalities in the planning area collect white goods as part of their residential solid waste services. The Town of Kernersville collects white goods from residents at the curb and accepts drop offs from Town residents at the Public Services site. This material is then picked up by a local scrap processor. The Town of Rural Hall collects white goods once per week. White goods containing Freon are taken to the white goods processing center at Hanes Mill Road Landfill. The remaining white goods are delivered to a local scrap processor. The Villages of Clemmons and Tobacoville and the City of Winston-Salem collect white goods as part of their annual bulky item collection service. The City of Winston-Salem provides this service from March through August of each year and collects once from each eligible residence in the service area during this period. White goods collected from these programs are taken to the white goods processing center at Hanes Mill Road Landfill.

White goods are accepted free of charge at the white goods processing center located at Hanes Mill Road Landfill. The white goods processing center is a storage, staging and transfer facility that facilitates customer vehicle unloading, transfer trailer loading and Freon evacuation. Omni Source in Kernersville manages the white goods program and evacuates the Freon from the appliances while still at the white goods processing center. The white goods are then transported to their scrap metal processing facility in Kernersville for recycling.

In FYE 2011, the white goods processing center at Hanes Mill Road Landfill received 351 tons of white goods. The amount of white goods brought to the program have been declining steadily over the last five years ostensibly due to the high value of scrap metal. Under contract with Omni Source, 167 pounds of refrigerant were removed from appliances and recycled. In FYE

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18 Scrap Tire Management Annual Report, July 1, 2007 - June 30, 2008, Forsyth County, NC. Estimated 85% recovery rate from personal conversation w/Scott Fowler, U. S. Tire, 3/20/2006.

2011, the total cost of the White Goods Management Program was \$20,000 and gross revenues from the sale of the scrap metal were \$58,162 resulting in net revenue of \$38,162. Forsyth County is currently ineligible to receive reimbursement for white goods management from the State.

**Intended Actions**

There are no plans to modify the program during the next three years.

**5.10.3 Used Motor Oil and Filters**

**Current Programs**

Collection of used motor oil is provided free to residents of Forsyth County at the Enviro-Station (see the following section for a full description of the services provided by the Enviro-Station). During FYE 2011, this program collected 6,567 gallons of used motor oil. Additionally, some auto parts stores and oil change service centers accept used motor oil as a part of their services. It is unknown whether these businesses charge a fee for the service. The Cooperative Extension Service operates an oil recycling program called HERO for *Help the Environment, Recycle Oil*. This program, targeted at the agricultural community, provides fact sheets and videos on the environmental consequences of improper disposal. The City of Winston-Salem and The Towns of Kernersville and Rural Hall collect used motor oil and filters from their fleet vehicles and send them to a processor for recovery.

**Intended Actions**

There are no plans to modify used motor oil management practices at this time.

**5.10.4 Household Hazardous Waste**

**Current Program**

Household hazardous waste management in Forsyth County is administered by the CCUC through an agreement with 3RC, a local waste management company specializing in HHW and CESQG waste management. 3RC provides daily HHW collection services through the *Enviro-Station*, which is operated out of its own permanent facility located on Martin Luther King Drive. Table 5-9 shows examples of the items accepted at the Enviro-Station.

**Materials Accepted at the Enviro-Station**

Paint & related products	Antifreeze	Acids
Pesticides	Fertilizers	Bases
Fuels	Pool chemicals	Batteries
Aerosols	Used motor oil	Fluorescent tubes and bulbs
Computer related equip.	Televisions	Cell phones

**Table 5-9**

In FYE 2011, the *Enviro-Station* accepted 492,834 pounds of HHW from Forsyth County residents. Paint and paint related products continue to make up over 50% of all HHW materials delivered to the facility. The total cost for this program in FYE 2011 was \$367,958. Both of these figures include e-waste. Costs for FYE 2012 will be increased due to the quantities of electronics, televisions in particular, that were accepted after the disposal ban went into effect.

The CCUC has approval from the Division of Waste Management to use screened latex paint from the *Enviro-Station* as an additive to its ADC, Posi-Shell. Tests showed that the inclusion of latex paint did not adversely affect the performance of the ADC and may actually help it better adhere to the waste. This arrangement allows the CCUC to better manage and beneficially reuse the large latex paint waste stream from the HHW program. In FYE 2011, almost 64 tons of latex paint were used in this program.

### **Intended Actions**

The CCUC and all local governments will continue to promote the existence and use of the *Enviro-Station* in all of their educational and outreach materials targeted to residential customers

## **5.10.5 Electronic Waste**

### **Current Programs**

In 2009, the *Enviro-Station* began accepting e-waste including computers and computer related devices, printers, speakers, scanners, fax machines, keyboards, mice, cell phones and TVs. 3RC, the contracted operator of the e-waste program, tracks and reports to the CCUC quantities of e-waste collected each month. As with all other HHW materials, a year-end report is compiled to analyze participation and waste material trends.

Public awareness and advertising for the e-waste program is an integral part of the *Enviro-Station* Program advertising campaign which is conducted through the government TV channel and website and print media. 3RC, the contracted operator of the e-waste program, tracks and reports to the CCUC quantities of e-waste collected each month. As with all other HHW materials, a year-end report is compiled to analyze participation and waste material trends.

Participation in the e-waste program increased dramatically after the landfill disposal ban went into effect on July 1, 2011 resulting in a huge influx of obsolete, analog TVs and some of the older flat panel TVs. In FYE 2011, approximately 75,000 lbs. of e-waste were accepted at the *Enviro-Station*, of which 18,333 lbs. were TVs representing 679 units. Based on current estimates the quantity of TVs collected will increase dramatically in FYE 2012. As of the end of March 2012, over 2,780 TVs had been received and it is anticipated that the final count will be close to 4,000 TVs by June 30.

Currently, the only e-wastes for which the CCUC has to pay 3RC are TVs, both the CRT-based type and the flat-panels. 3RC charges the CCUC \$15 per unit for management of these materials. At the end of March total costs for TVs was \$41,805 and is anticipated to be \$70,000 by June 30. Forsyth County has received two distributions from the E-waste Management Fund totaling \$52,771. Figure 5-10 below shows the accounts used for e-waste funds received and spent.

## E-Waste Management Account Expenses & Revenues

Account Name: E-Waste Management		FYE 2012	FYE 2013
Account No.	Description	Actuals	Budget
Expenses			
50751-527105	Other Contractual Services	52,616	62,620
Expenses Subtotal		52,616	62,620
Revenues			
50751-6125	E-Waste Management Tax	(52,771)	(26,500)
Revenues Subtotal		(52,771)	(26,500)
<b>Net</b>		<b>\$ (155)</b>	<b>\$ 36,120</b>

**Table 5-10**

3RC, the program operator, accepts and packages the e-waste and sends it to Electronic Recyclers International (ERI), located in Badin, NC that holds e-Stewards and Responsible Recycling certifications.

*ReConnect*, a joint venture by Dell Computer and Goodwill of Northwest North Carolina, is a computer and electronic reuse/recycling program available to all of northwestern North Carolina including Forsyth County. Through this program, any computer or related equipment can be taken to any attended Goodwill donation center in the area served by Goodwill of Northwest North Carolina. In Forsyth County alone, there are 18 locations participating in the program. Many of the computers and parts are reused by being resold through Goodwill Stores. Unusable parts are recycled through a local electronic recycling facility.

For the past seven years, the Town of Kernersville has held an e-recycling event every January to collect electronic devices, CRT's, and batteries. In 2009, Kernersville collected e-waste from 660 residents and businesses over the course of two weeks, and diverted over 30 tons of material from the landfill. In that same year, the Town started a curbside e-recycling program for all its residents. This program runs for two weeks every January. All materials collected in these programs are shipped to electronic recycling companies for recovery and reclamation.

### **Intended Actions**

There are no plans to make changes to the existing e-waste management programs in the planning area. All local governments in the planning area will continue to encourage residents to use the services provided through the *ReConnect* Program offered by Dell Computers and Goodwill of Northwest North Carolina as well as the services of the Enviro-Station to properly manage e-waste.

### **5.10.6 Abandoned Manufactured Homes**

Presently, Forsyth County has chosen not to implement a plan to manage abandoned manufactured homes. When the County develops a plan for the management of abandoned manufactured homes, a copy will be submitted to the DENR regional office for inclusion in the Solid Waste Management Plan.

## 5.11 Illegal Disposal and Litter

### Current Programs

#### *Illegal disposal*

The Forsyth County Office of Environmental Assistance and Protection addresses illegal disposal matters especially in the form of investigating sites that are reported by concerned citizens. Many of these sites contain scrap tires or construction and demolition debris. In the City of Winston-Salem, the Community and Business Development Department investigates complaints concerning illegal dumping within the City's boundaries.

#### *Litter management*

The City of Winston-Salem has a policy for the prevention of litter in the form of the City Sanitation Code. The code incorporates language to reference litter in general. The policy also allows the police to cite people according to the state litter laws, while the City Code allows for a 30-day imprisonment. The CCUC has a covered loads policy for vehicles entering the landfills designed to prevent waste from being blown from loads in transit.

Keep Winston-Salem Beautiful (KWSB), the local affiliate of Keep America Beautiful, has as its primary focus litter prevention and beautification within the host community. By working closely with other City of Winston-Salem divisions and private businesses, KWSB coordinates and conducts many events held throughout the year that promote litter prevention and environmental education. Key programs are as follows:

- Adopt-A-Street – Individuals, community and civic organizations and businesses adopt a section of one or more city streets and agree to collect litter at least six times per year. Signs are erected at each location, supplies are provided and trash is collected. Currently there are over 75 adopted streets in Winston-Salem. State maintained streets are similarly treated through the NCDOT Adopt-A- Highway Program.
- Adopt-A-Stream – A new program co-coordinated by KWSB and the City's Storm Water Division, individuals, community and civic organizations and businesses adopt a section of a local waterway and agree to remove trash and bulky items at least two times per year and monitor the water quality. Signs are erected at each location, supplies are provided and trash is collected. Currently there are over 25 adopted waterways in Winston-Salem.
- Adopt-A-Park – A program in which individuals, community and civic organizations and businesses adopt a city park and agree to collect trash at least four (4) times per year. Signs with the group's name are erected at each park, supplies are provided and trash is collected. Currently there are 25 adopted parks in Winston-Salem.
- Sign Sweepers – A program in which individuals, community and civic organizations and businesses adopt a section of a city street or streets and agree to remove and dispose of illegally placed signs along the public right-of-way or on utility poles throughout the year. Currently there are 12 adopted areas in Winston-Salem.

- Great Winston-Salem Clean Up – Annual cleanup in April is part of the national Great American Cleanup coordinated by Keep America Beautiful. Hundreds of volunteers select or are assigned to cleanup specific streets, parts or neighborhoods. In 2011, over 700 volunteers collected over 14 tons of trash and debris.
- Big Sweep – Held every fall, this annual event is conducted nationwide and utilizes volunteers to clean up the City’s creeks, streams, and lakes. In past years, the NC Big Sweep organization presented Forsyth County with the Outstanding Community Involvement Award for their volunteer turnout and volume, the largest in the state. In 2011, nearly 4,000 volunteers removed over 16 tons of trash and debris from local waterways.

KWSB also conducts an annual ‘Litter Index’ of Winston-Salem as required by the parent organization, Keep America Beautiful. The city is divided up into nearly 100 sub areas based on land usage. Teams drive through these areas and assign scores based on the presence or absence of litter along roadways. Winston-Salem received a score of 1.65 in 2011 with 1 being litter free and 4 being an illegal dump. This annual study is used to target future cleanup activities for KWSB events and ongoing programs.

The Town of Lewisville Beautification Committee coordinates an Adopt-A-Street program as well as an annual town-wide one-day event to pick up trash in right-of-ways and other public property. The Town also uses court-ordered community service workers to pick up litter from right-of-ways. The Village of Clemmons coordinates an Adopt-A-Street program as well as two annual Village-wide events to pick up trash in right-of ways and on other public properties. One pickup is in cooperation with service requirements for students and the other pickup is provided by volunteer groups.

The Towns of Kernersville and Rural Hall participate annually in the NC Department of Transportation Spring Litter Sweep Campaign.

## **Intended Actions**

### ***Illegal disposal***

To address illegal disposal and other issues, the County will seek the assistance of local law enforcement officials and decision-makers to address remaining problems and to assist in illegal dumping abatement program development. All reported illegal disposal sites will continue to be investigated and attempts made to identify the responsible party.

### ***Litter management***

Keep Winston-Salem Beautiful continues to increase its litter prevention education programs in the schools and the community. The Town of Kernersville will continue to participate in the Spring Litter Sweep activities and explore ways to increase volunteerism in this program.

## **5.12 Purchasing Recycled Products**

### **Current Programs**

The Town of Kernersville has an Environmentally Responsible Purchasing Policy (ERPP), which promotes the purchase of recycled content materials and environmentally preferable products by Town employees and officials, as well as contractor purchases. The Town of Rural Hall Board has a policy encouraging all departments to purchase and use products with recycled material. Preference is given to products with higher levels of post-consumer recycled content.

### **Intended Actions**

The CCUC will continue to encourage the City/County Purchasing Division and area businesses to establish a policy to purchase supplies with recycled content if cost effective. Commission staff will utilize the resources of the Buy Recycled Business Alliance to promote and measure the effectiveness of these initiatives. The Towns of Kernersville and Rural Hall will continue promoting their environmentally preferred purchasing policies among its departments.

## 6 EMERGENCY AND DISASTER RESPONSE

It is critical for county and municipal local governments to have an effective emergency and disaster response plan in place that fully addresses the collection and management of disaster debris. Providing these vital services in a timely manner after a disaster helps reduce the chances of further health and safety concerns beyond those presented by the disaster itself. The collection and sanitary disposal of dead animals, the recycling or disposal of construction and demolition waste and vegetative waste, along with the continuation of regular garbage removal services is vital to maintaining public health and preventing disease outbreaks.

### **Current Programs**

The *Forsyth County Multi-Jurisdictional Hazard Mitigation Plan* provides for the comprehensive mobilization and operation of numerous government agencies and private organizations to assist with the collection and management of debris resulting from a natural or other disaster. This Plan was last updated in 2010 with involvement by all jurisdictions and the public at large. Every local government in Forsyth County passed a resolution approving and adopting the Plan and it has been officially approved by the Federal Emergency Management Agency (FEMA). The most recent update to the Plan can be found by clicking [HERE](#).

The *Winston-Salem/Forsyth County Emergency Operations Plan*, updated in October 2010, provides details on how specific government and private organizations will respond to specific consequences of the emergency or disaster and it can be found by clicking [HERE](#). Appendix 1 of the Operations Plan provides information on waste collection, disposal and management under the heading of *Public Works and Engineering Emergency Support Function (ESF-3)*. Immediately following, Appendix 2 contains the *Disaster Debris Management Plan* where all areas reserved for staging disaster debris are found. This Plan was developed by CCUC staff to be in compliance with NCGS 130A-309.09A(b)(5)(h).

In this Operations Plan, the CCUC has identified five locations to be used to temporarily or permanently stage and/or process storm debris. The Overdale Yard Waste Facility and the Forum 52 Yard Waste Facility are process sites for vegetative storm debris, both of which are already permitted and used for other yard waste storage/processing. This list of identified sites will be updated and any additional permitting will be obtained prior to the use of these sites for storm debris management. Kernersville has designated an area at its Beeson Park location as an emergency storm debris storage site that will be available for City and Forsyth County use in the event of an emergency. The facility is several acres in area and is located at the end of Beeson Road in Kernersville.

### **Intended Actions**

Organizations participating in emergency and disaster response will maintain and keep available all of the resources required to effectively manage wastes produced as a result of the disaster. *The Forsyth County Multi-Jurisdictional Hazard Mitigation Plan*, including the *Disaster Debris Management Plan*, will be reviewed on a regular basis and updated when needed. CCUC Staff will work with DWM staff to obtain pre-approval of sites proposed for staging and processing storm debris. Emergency crews will remain in a state of readiness when confronted with the likelihood of an approaching disaster capable of producing large quantities of storm debris.

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## 7 SOLID WASTE MANAGEMENT COSTS AND FINANCING

North Carolina General Statute 130A-309.08 requires that counties and municipalities determine and report annually the full cost of solid waste management services in their service area to all residential and non-residential users of the services. The mechanism by which this is accomplished is most often through the *Solid Waste Management Annual Report* completed annually by each municipality and county. Part I of the Annual Report contains full cost data for solid waste collection, disposal, recovery, and mulching/composting programs. This section of the Plan provides a summary description and assessment of solid waste management costs as reported by the CCUC and each municipality based upon each jurisdiction's FYE 2011 *Solid Waste Management Annual Report*, and updated information provided by selected jurisdictions. It also includes a description of financing methods for CCUC operated programs and services.

The CCUC continues to have its Cost of Service Study, a full cost analysis (FCA) that was performed by an independent consultant and initially published in October 2004, updated periodically. The last update was published in 2009 and it is scheduled to be updated again in 2012. This FCA allocates all identified annual costs to 14 service centers (programs, services or facilities) over a 20-year planning period. Capital and other multi-year costs are included and amortized over the life of the asset/facility or the planning period, whichever is most appropriate. Costs from the FCA are then used as a basis to construct a 20-year financial model that shows projected operating results and fund balances for all 14 service centers operated by the CCUC. Included in this 20-year financial model are all planned capital projects that will assure adequate solid waste management capacity during the planning period and beyond. A benchmarking study, also written by an independent consultant and updated periodically, reports the effectiveness and efficiency of CCUC programs compared to their public and private counterparts. In addition, the City of Winston-Salem Finance Department completes audited financial statements each year for solid waste operations.

### 7.1 Costs – Descriptions and Assessment

Tables 7-1, 7-2 and 7-3 show total annual costs for waste collection/disposal, recycling and yard waste collection, respectively, on a per-ton and per-household basis for each municipality included in the Plan. Annual costs reflect administrative, public education, and code enforcement costs as well as (for some communities) bulk container collection services not reflected in the per-household costs for specific services provided to residents of single family and low density multi-family dwellings. Costs for collecting waste and recyclables vary with the nature of services provided, the size of the town, and other variables, so caution is advised if comparing costs between municipalities. Comprehensive data may be unavailable for all communities. As each jurisdiction refines its record keeping and accounting methods, reporting of more accurate and detailed cost information will be possible in future years.

### Solid Waste Collection & Disposal Costs by Municipality

Municipality	Annual Costs	Collected & Disposed		Households	
		Tons	\$/Ton	Served	\$/Month
Bethania	\$ 25,593	130	\$ 196.87	165	\$ 12.93
Clemmons	\$ 1,049,585	5,687	\$ 184.56	5,920	\$ 14.77
Kernersville	\$ 581,981	5,107	\$ 113.96	6,418	\$ 7.56
Lewisville	\$ 581,623	3,760	\$ 154.69	4,719	\$ 10.27
Rural Hall	\$ 90,454	650	\$ 139.16	991	\$ 7.61
Tobaccoville	\$ 121,412	819	\$ 148.24	1,091	\$ 9.27
Walkertown	\$ 259,697	1,933	\$ 134.35	1,712	\$ 12.64
Winston-Salem	\$ 8,528,946	74,882	\$ 113.90	76,064	\$ 9.34

**Table 7-1**

### Recycling Collection & Processing Costs by Municipality

Municipality	Annual Costs	Collected & Recycled		Households	
		Tons	\$/Ton	Served	\$/Month
Bethania	\$ 7,722	41	\$ 188.34	165	\$ 3.90
Clemmons	\$ 172,548	1,090	\$ 158.30	6,095	\$ 2.36
Kernersville	\$ 250,359	1,319	\$ 189.81	6,418	\$ 3.25
Lewisville	\$ 127,772	649	\$ 196.88	4,719	\$ 2.26
Rural Hall	\$ 31,118	138	\$ 225.49	1,018	\$ 2.55
Tobaccoville	\$ 29,784	88	\$ 338.45	1,091	\$ 2.27
Walkertown	\$ 47,658	157	\$ 303.55	1,715	\$ 2.32
Winston-Salem	\$ 2,232,568	10,565	\$ 211.32	76,064	\$ 2.45

**Table 7-2**

### Yard Waste Collection & Processing Costs by Municipality

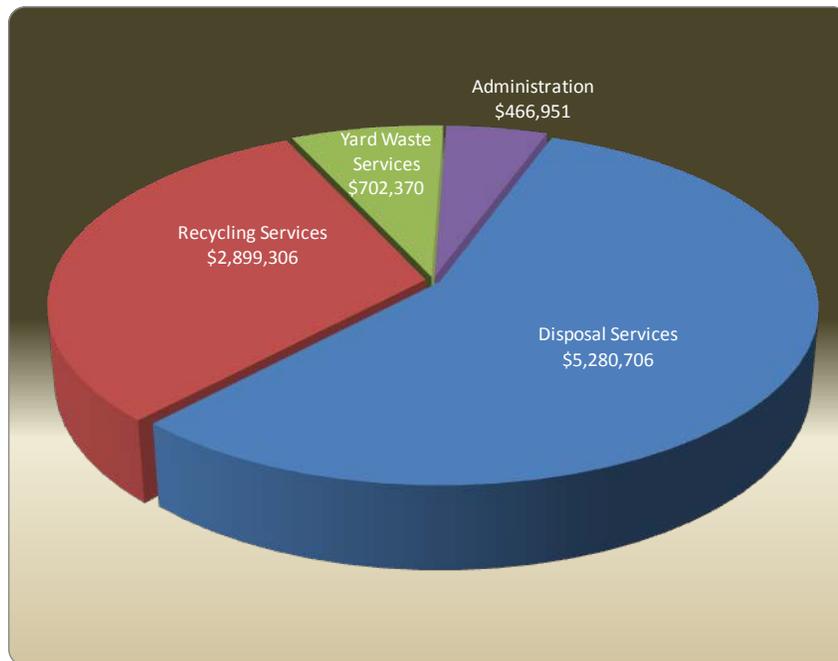
Municipality	Annual Costs	Collected & Composted		Households	
		Tons	\$/Ton	Served	\$/Month
Bethania	NA	NA	NA	NA	NA
Clemmons	\$ 237,487	4,511	\$ 52.65	1,195	\$ 16.56
Kernersville	\$ 382,350	3,385	\$ 112.95	6,418	\$ 4.96
Lewisville	NA	NA	NA	NA	NA
Rural Hall	\$ 7,000	150	\$ 46.67	991	\$ 0.59
Tobaccoville	NA	NA	NA	NA	NA
Walkertown	NA	NA	NA	NA	NA
Winston-Salem	\$ 4,374,651	36,994	\$ 118.25	76,064	\$ 4.79

**Table 7-3**

The CCUC operates an integrated solid waste management system for Forsyth County through 13 comprehensive services.<sup>19</sup> These services comprise four major categories of expenses in the CCUC budget that are listed below. Figure 7-1 shows how expenses are allocated across the four major categories of services.

- **Administration** (provides administrative support for all solid waste services)
- **Disposal Services**
  - Hanes Mill Road MSW Landfill
  - Old Salisbury Road C & D Landfill
  - Ebert Road Landfill (closed)
- **Yard Waste Services**
  - Overdale Road Yard Waste Facility
  - Forum 52 Yard Waste Facility
  - Reynolds Park Road Leaf Site
- **Recycling Services**
  - HHW Collection Center
  - White Goods Processing
  - Tire Recycling
  - City of Winston-Salem Curbside Recycling
  - County Drop-Off Recycling (3 locations)
  - School Recycling

**Actual Operating Costs for CCUC Services**



**Figure 7-1**

<sup>19</sup> These are not the same service and program descriptions defined in the Cost of Service Study.

Table 7-4 below shows FYE 2011 *actual* operating expenses and FYE 2012 *budgeted* operating expenses for each of the 13 services provided by the CCUC.

**Detailed Annual Operating Costs<sup>20</sup> for  
CCUC Solid Waste Management Services**

Service Description	Actual FY 2010-11	Budgeted FY 2011-12
<b>Administration</b>	<b>466,951</b>	<b>492,390</b>
<b>Disposal Services</b>	<b>5,280,706</b>	<b>6,186,340</b>
Hanes Mill Road MSW Landfill	4,257,596	4,818,640
Old Salisbury Road Landfill	986,557	1,304,500
Ebert Road Landfill (closed)	36,554	63,200
<b>Yard Waste Services</b>	<b>702,370</b>	<b>826,090</b>
Overdale Yard Waste Facility	564,605	623,610
Forum 52 Yard Waste Facility	136,770	166,480
Reynolds Park Road Leaf Site	995	36,000
<b>Recycling Services</b>	<b>2,899,306</b>	<b>2,418,050</b>
HHW Collection Center	25,556	-
White Goods Processing	20,000	20,000
Tire Recycling	539,564	522,260
City of W-S Curbside Recycling	2,235,891	1,771,220
County Drop-Off Recycling	(1,596)	12,000
School Recycling	79,891	92,570
<b>Total</b>	<b>\$ 9,349,334</b>	<b>\$ 9,922,870</b>

**Table 7-4**

In addition to these annual operating expenses, the CCUC budgets capital expenses for many of its services. Table 7-5 provides a breakdown of the capital expenses related to existing and future solid waste services provided by the CCUC. These listed capital expenses are only for one year and the amounts vary greatly from year to year based on project schedules. The largest capital expenses for Hanes Mill Road Landfill are typically for cell construction in the years when it occurs. All capital expenses, except for closure and post closure care, are paid for with a combination of cash reserves and bond proceeds. Closure and post closure care costs are paid for using funds out of a separate, restricted account.

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<sup>20</sup> Includes salaries & wages, maintenance & operating and equipment costs.

**Capital Expenses for CCUC  
Solid Waste Management Services**

Facility/Service/Program Name	Actual FYE 2011	Budgeted FYE 2012
Hanes Mill Road Landfill	\$ 4,058,216	\$16,117,900
Old Salisbury Road Landfill	\$ -	\$ 500,000
Future C & D Landfill	\$ 29,954	\$ 7,640,000
Overdale Rd. Yard Waste Facility	\$ -	\$ 94,000
<b>Total</b>	<b>\$ 4,088,170</b>	<b>\$24,351,900</b>

**Table 7-5**

## 7.2 Financing Methods

The solid waste collection programs for the municipalities in Forsyth County are funded by property taxes that pay for the cost of collection and disposal, with one exception. The City of Winston-Salem charges user fees to cover the cost of collecting and disposing of bulk container (dumpster) waste, all of which comes from multi-family housing units, businesses or institutions. The recycling programs of the smaller municipalities are also tax supported with one exception. The Town of Kernersville charges a fee to residents for its curbside recycling program. The City of Winston-Salem curbside recycling program is funded by the CCUC through an inter-departmental transfer to the Sanitation Division. The two staffed drop-off recycling centers are funded by both the CCUC and Forsyth County.

The CCUC's largest revenue source is landfill tip fees. Other sources include commodity revenues, inter-governmental transfers, interdepartmental transfers, property rental, gain/loss on sale of assets and investments. Prior to FYE 2008, investments provided a significant source of revenue to the CCUC and helped assure a healthy fund balance. Recent economic events have made both fixed income and equity investments less reliable income sources. Table 7-6 shows the funding sources and actual revenues for FYE 2011. The pie chart in Figure 7-2 on the following page better illustrates the share of each revenue source.

**Sources of Funding for CCUC Programs**

Source	FYE 2011 Actual	FYE 2012 Budget
Tip Fees	\$ (9,209,548)	\$ (10,057,180)
Excise Taxes	\$ (693,009)	\$ (652,470)
Transfers In	\$ (413,274)	\$ (486,150)
Investments	\$ (857,210)	\$ (256,610)
Recycling	\$ (649,753)	\$ (618,690)
Other	\$ 10,099	\$ (30,570)
<b>Totals</b>	<b>\$ (11,812,695)</b>	<b>\$ (12,101,670)</b>

**Table 7-6**

Tip fees are charged at four of the CCUC's solid waste facilities: Hanes Mill Road Landfill, Old Salisbury Road Landfill, Overdale Road Yard Waste Facility and Forum 52 Yard Waste Facility. A two-tier tip fee system is employed at Hanes Mill Road Landfill where large, commercial customers who deliver at least 700 tons of MSW to the landfill per month pay \$30/ton while all others pay \$34/ton. Customers of Old Salisbury Road Landfill pay \$28/ton.<sup>21</sup> Citizens who deliver waste in cars, cars with trailers or pickup trucks to either facility pay a minimum flat fee based on estimated weights for vehicles; they are not weighed. The tip fee at the CCUC's two yard waste facilities is \$29/ton. Daily operating costs at the landfills operated by the CCUC are entirely supported by tipping fees.

Until 2010, the fees covered daily operations, construction, future site development, closure and post-closure care. Substantial increases in costs for non-disposal related services funded by the CCUC and a dramatic reduction in incoming tonnages at both landfills caused fund balances to drop over the last 4 years.

Historically, the CCUC has funded waste reduction and recycling programs in Winston-Salem and Forsyth County. Through an interlocal agreement, the City of Winston-Salem and Forsyth County are phasing in their contribution to funding these programs. In FY 2012, the CCUC funded 60% of these programs while the City and County funded the remaining 40%. In FY 2013, the CCUC will fund 50% and the City and County will fund 50%. It is anticipated that by the end of FYE 2014, all recycling programs that are currently funded by the CCUC will be wholly funded by two local governments that should reduce future deficits for the Solid Waste Fund. The Household Hazardous Waste Program is now being funded entirely by the Water & Sewer and Stormwater Divisions via a transfer to the Solid Waste Fund.

### Actual Revenues from CCUC Programs & Services

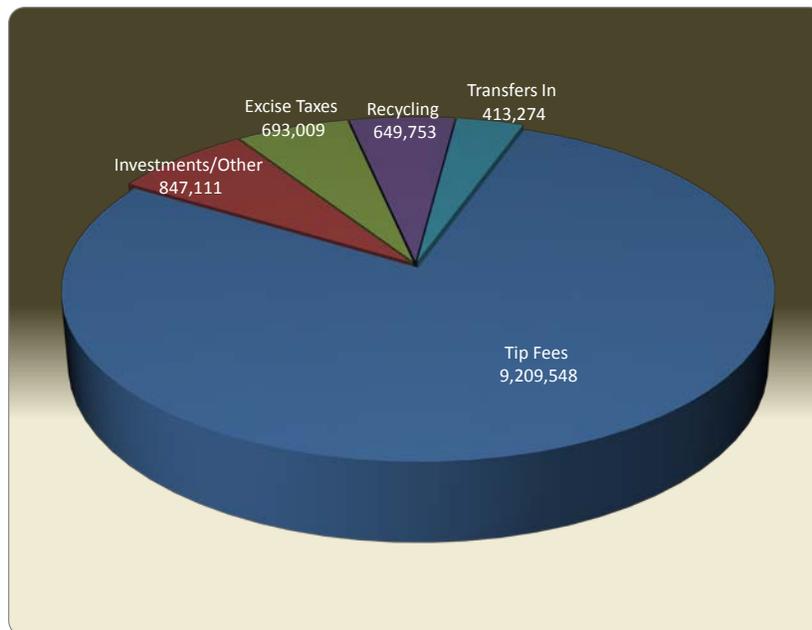


Figure 7-2

<sup>21</sup> The \$2/ton solid waste disposal tax applies to Hanes Mill Rd. Landfill and Old Salisbury Rd. Landfill, which is added to the tip fees at both of these facilities.

Fee-based services are working well overall, however the current economic downturn has created serious challenges while operating within tight budgets. Hanes Mill Road Landfill generates revenues that cover current operations as well as sufficient reserves for construction and maintenance of the landfills and post-closure requirements. Conversely, Old Salisbury Road C & D Landfill, which used to be a sound funding source, is now struggling to break even due to the dramatic downturn in construction and demolition related activities. Almost all other solid waste programs in Winston-Salem and other municipalities are dependent upon general fund revenues.

Given that substantial tip fee revenue received at these facilities is ultimately paid by the municipalities, the Utility Commission utilizes some of the revenue to support recycling programs and facilities benefiting all jurisdictions, namely the recycling centers at the Hanes Mill Road Landfill, Kernersville, and Pfafftown, the City of Winston-Salem’s curbside recycling program, and the Enviro-Station HHW collection program. State excise taxes and landfill tipping fees fund the tire management program. The CCUC absorbs any net expense for the white goods program because it is currently ineligible to receive funds from the White Goods Management Account.

The \$2/ton State tax on all disposed waste in North Carolina applies to two CCUC operated facilities, Hanes Mill Road Landfill and Old Salisbury Road Landfill. Every permitted solid waste disposal facility in North Carolina is required to make quarterly remittances to the State of \$2/ton for every ton of waste disposed or transferred out of the State. Subsequently, the State Department of Revenue makes a quarterly distribution of a portion of the collected funds to the cities and counties based on population. Table 7-7 shows the total annual distribution amounts of the Solid Waste Disposal Tax returned to local governments in Forsyth County in FYE 2011. These funds will be used to help pay for and expand existing solid waste programs and add new ones.

**Solid Waste Disposal Tax  
Distributions by Jurisdiction**

Local Government	For FY Ending 6/30/2011
Bethania	269
Clemmons	12,679
Kernersville	15,597
Lewisville	9,490
Rural Hall	1,969
Tobaccoville	1,896
Walkertown	3,420
Winston-Salem	159,429
Forsyth County	43,960
<b>Total</b>	<b>\$248,709</b>

**Table 7-7**

Figure 7-3 is the audited financial statement for the Solid Waste Management Fund for FYE 2011. Operating income as well as income from most other sources was less than budgeted. Despite the lower than anticipated revenues, a projected \$2 million deficit was avoided by a \$2.4 million reduction in operating expenditures. The result was a contribution of \$378,236 to fund balance. A deficit of over \$2 million is projected for FYE 2012.

**Solid Waste Disposal Fund - Schedule of Revenues, Expenditures and Transfers**

For Fiscal Year Ending June 30, 2011

	<u>Tot. Budget</u>	<u>Actuals</u>	<b>Variance Favorable (Unfavorable)</b>
<b>Operating Revenues</b>			
Charges for Services	10,096,699	9,859,301	(237,398)
Other	<u>28,380</u>	<u>18,457</u>	<u>(9,923)</u>
<i>Total Operating Revenue</i>	10,125,079	9,877,758	(247,321)
<b>Operating Expenditures</b>			
Personal Services	1,804,840	1,724,367	(80,473)
Maintenance & Operations	<u>7,627,220</u>	<u>5,300,280</u>	<u>(2,326,940)</u>
<i>Total Operating Expenditures</i>	<u>9,432,060</u>	<u>7,024,647</u>	<u>(2,407,413)</u>
<i>Operating Income</i>	693,018	2,853,111	2,160,092
<b>Non-Operating Revenues/(Expenditures)</b>			
Intergovernmental Revenue	944,590	746,972	(197,618)
Investment Income	630,000	857,210	227,210
Proceeds from Sale of Assets	-	237,550	237,550
Interest & Fiscal Charges	(555,100)	(539,209)	15,891
Principal Retirement	<u>(1,795,510)</u>	<u>(1,764,861)</u>	<u>30,649</u>
<b>Total Non-Operating Expenditures, Net</b>	<u>(776,020)</u>	<u>(462,339)</u>	<u>313,681</u>
<i>Income Before Transfers</i>	(83,002)	2,390,772	2,473,773
<b>Transfers</b>			
Transfers In	359,311	359,311	-
Transfers to General Fund	<u>(2,432,700)</u>	<u>(2,371,847)</u>	<u>60,853</u>
<i>Change in Net Assets - Modified Accrual Basis</i>	<u><b>(2,156,390)</b></u>	<u><b>378,236</b></u>	<u><b>2,534,626</b></u>
 Reconciliation of Modified Accrual Basis to Full Accrual Basis			
<i>Change in Net Assets - Modified Accrual Basis</i>		378,236	
Depreciation		(1,607,181)	
Unamortized Financing Costs		(37,571)	
Principal Retirement		1,764,861	
Book Value of Disposed Assets		<u>(266,106)</u>	
<i>Change in Net Assets - Full Accrual Basis</i>		<u><b>232,239</b></u>	

**Figure 7-3**

## **APPENDIX A-1**

### **Notice of Public Meeting**

#### **PUBLIC MEETING NOTICE**

The Winston-Salem/Forsyth County Utility Commission will hold a public meeting Monday, May 14, 2012 on the Forsyth County 10 Year Solid Waste Management Plan Update. The purpose of this meeting is to receive public comment on the three-year update to the Plan. This public meeting will be held during the Utility Commission's regularly scheduled meeting beginning at 2 p.m. in the Winston-Salem City Council Chamber, Room 230, City Hall, 101 N. Main Street, Winston-Salem, NC.

Draft copies of the update to the 10 Year Solid Waste Management Plan will be available for review at all municipal town halls in Forsyth County; the main branch of the Forsyth County Library, 660 W. Fifth St. Winston-Salem; the City/County Utilities Division Administrative Offices, 101 N. Main Street, Suite 357, Winston-Salem, NC; and on the internet at [this link](#).  
<http://www.ci.winston-salem.nc.us/Assets/CityOfWS/Documents/Utilities/A%20SWM%20Plan%202012%20Draft%202-2.pdf>

For more information, call the Utilities Division at 747-7320.

## APPENDIX A-2

### Public Comments to the SWM Plan



May 7, 2012

Winston-Salem / Forsyth County Utilities  
PO Box 2511  
Winston-Salem, NC 27102

Attention: Ms. Janis McHargue, Solid Waste Administrator

Subject: Public Comment to Solid Waste Plan

Dear Ms. McHargue,

Abbey Green submits the following public comment which we believe will augment information presented in the Solid Waste Plan.

Abbey Green is a recycling and transfer center, permitted to receive 425 tons per day (annually in excess of 100,000 tons) of C&D waste and limited industrial wastes which are of "like character" with C&D wastes. We are permitted to receive waste from 18 counties, although a large percentage of our waste, perhaps 90%, comes from Forsyth County

In 2008 we first presented the plan for our facility to the staff of the Utility Commission, and we have enjoyed a good cooperation since that time. We have continually been open with the Commission concerning our goals, and our volumes from within the county, so that the Commission can plan for the effect we will have on the operations at of the Commission's landfills. We started operation in January 2011 and have since reached a "run rate" that allows us to project with some certainty we will achieve 30,000 plus tons in the July 1, 2011 until June 30, 2012 timeframe.

We are recycling at a rate of over 70% of debris as measured by weight. We have improved our processes and believe higher percentages will be achieved. In addition we have recently begun to recycle tear-off shingles and carpet which further enhances our ability to take additional debris previously not recycled.

We reference Section 4.1 (page 18 paragraph 2) of your Plan which discusses private waste companies and the effect of holding down tipping fees below the State's average cost of disposal. Abbey Green's tipping fees are above those of the Commission's facilities for like debris, so this condition does not apply to us.

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PO Box 12339  
Winston-Salem, NC 27117

Abbey Green Inc.

Telephone: 336 785 2130  
[www.abbeygreen.com](http://www.abbeygreen.com)

Page 2

We look forward to our continuing cooperation with the Utilities Commission in reaching their goals for recycling in Forsyth County.

Sincerely,



J. R. Baker  
General Manager  
Abbey Green

cc. David Neill, Chairman Utility Commission

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PO Box 12339  
Winston-Salem, NC 27117

Abbey Green Inc.

Telephone: 336 785 2130  
Fax: 336 785 2826

## **APPENDIX B**

### **Resolutions from Participating Local Governments Adopting the Plan**

## Forsyth County

### RESOLUTION ADOPTING AN UPDATED 2012-2022 COMPREHENSIVE SOLID WASTE MANAGEMENT PLAN

**WHEREAS**, N.C. General Statute 130A-309.09A(b) requires each unit of local government, either individually or in cooperation with other units of local government to develop a 10-year comprehensive solid waste management plan; and

**WHEREAS**, the Division of Waste Management encourages local governments within the same county to collaborate and develop a single, comprehensive plan; and

**WHEREAS**, as previously authorized by the County, the Winston-Salem/Forsyth County Utility Commission has developed an updated 10-year Comprehensive Solid Waste Management Plan for Forsyth County and all incorporated municipalities within the county; and

**WHEREAS**, the Winston-Salem/Forsyth County Utility Commission included public input in the Solid Waste Management planning process by making the proposed plan available for public review and comment at a public meeting held on May 14, 2012 as required by N.C.G.S. 130A-309.09A(b); and

**WHEREAS**, the said updated 2012-2022 Comprehensive Solid Waste Management Plan ensures adequate resources exist in the County for solid waste collection services, disposal capacity, waste reduction, and solid waste management practices for the citizens of the County; and

**WHEREAS**, State law requires each solid waste management plan to be updated at least every three years; and

**WHEREAS**, the updated 2012-2022 Comprehensive Solid Waste Management Plan was adopted by the Winston-Salem/Forsyth County Utility Commission on May 14, 2012; and

**WHEREAS**, the County staff recommends adoption by Forsyth County of the updated 2012-2022 Comprehensive Solid Waste Management Plan.

**NOW, THEREFORE, BE IT RESOLVED** by the Forsyth County Board of Commissioners that the updated 2012-2022 Comprehensive Solid Waste Management Plan is hereby adopted on behalf of Forsyth County.

Adopted this the 25<sup>th</sup> day of June 2012.

**ADOPTED**

**JUN 25 2012**

Forsyth County Board  
of Commissioners

## **City/County Utility Commission**

### **RESOLUTION ADOPTING THE 2012 UPDATE TO THE FORSYTH COUNTY 10 YEAR SOLID WASTE MANAGEMENT PLAN**

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WHEREAS, NC General Statute 130A-309.09A(b) requires all North Carolina Counties to submit updates to their 10 Year Solid Waste Management Plan every three years; and

WHEREAS, the last update to the Forsyth County Solid Waste Management Plan was submitted in 2009; and

WHEREAS, CCUC staff have compiled the update to the Forsyth County Solid Waste Management Plan for Forsyth County and all incorporated municipalities within the county; and

WHEREAS, the above cited statute requires public input into the planning process; and

WHEREAS, the Plan has been made available for public review and comment and the place and time of a public meeting has been advertised.

NOW, THEREFORE, BE IT RESOLVED by the City/County Utility Commission, an agency representing the interests of the City of Winston-Salem and Forsyth County on solid waste issues, hereby adopts the 2012 Update to the Forsyth County 10-Year Solid Waste Management Plan.

**ADOPTED**

**May 14, 2012**

City/County  
Utility Commission

**Town of Bethania**

**RESOLUTION TO APPROVE THE WINSTON-SALEM/FORSYTH COUNTY  
SOLID WASTE MANAGEMENT PLAN**

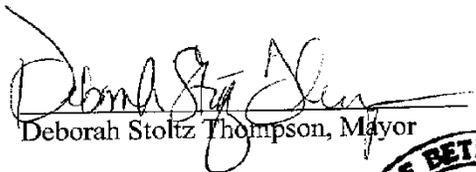
**WHEREAS**, better planning for solid waste will help protect public health and the environment, provide for an improved solid waste management system, better utilize our natural resources, control cost of solid waste management; and

**WHEREAS**, the Town of Bethania adopted a solid waste management plan on June 11, 2009; and

**WHEREAS**, the Town of Bethania, in cooperation with the Winston-Salem/ Forsyth County Utility Commission, realizes the need for a 3-year update to the 10 Year Solid Waste Management Plan,

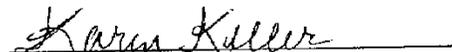
**NOW, THEREFORE, LET IT BE RESOLVED** that the Board of Commissioners of the Town of Bethania hereby adopts the Forsyth County 10 Year Solid Waste Management Plan (SWMP) for the planning period of July 1, 2012 to June 30, 2022.

Adopted this 29<sup>th</sup> day of June 2012.

  
Deborah Stoltz Thompson, Mayor



ATTEST:

  
Karen Keller, Town Clerk

## Village of Clemmons

Resolution Number 2012-R-08

### RESOLUTION ADOPTING THE 2012 UPDATE TO FORSYTH COUNTY SOLID WASTE MANAGEMENT PLAN FOR THE VILLAGE OF CLEMMONS

WHEREAS, it is a priority of this community to protect human health and the environment through safe and effective management of municipal solid waste;

WHEREAS, the reduction of the amount and toxicity of the local waste stream is a goal of this community;

WHEREAS, equitable and efficient delivery of solid waste management services is an essential characteristic of the local solid waste management system;

WHEREAS, it is a goal of the community to maintain and improve its physical appearance and to reduce the adverse effects of illegal disposal and littering;

WHEREAS, the Village of Clemmons recognizes its role in the encouragement of recycling markets by purchasing recycled products;

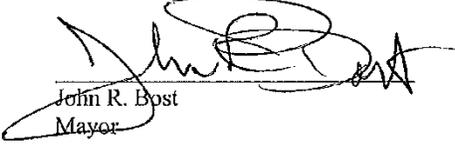
WHEREAS, involvement and education of the citizenry is critical to the establishment of an effective local solid waste program;

WHEREAS, the State of North Carolina has placed planning responsibility on local government for the management of solid waste;

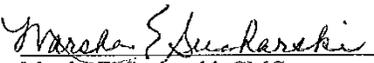
WHEREAS, NC General Statute 130A-309.09A(b) requires each unit of local government, either individually or in cooperation with other units of local government, to update the Ten Year Comprehensive Solid Waste Management Plan at least every three years;

WHEREAS, the City-County Utilities Solid Waste Management Department and Citizens Solid Waste Advisory Council have undertaken and completed a long-range planning effort to evaluate the appropriate technologies and strategies available to manage solid waste effectively;

NOW, THEREFORE, BE IT RESOLVED BY THE CLEMMONS VILLAGE COUNCIL that the 2012 Ten Year Comprehensive Solid Waste Management Plan is accepted and endorsed and placed on file with the Clerk to the Council on this 11th day of June, 2012.

  
John R. Bost  
Mayor

ATTEST:

  
Marsha E. Sucharski, CMC  
Village Clerk



**Town of Kernersville**

**RESOLUTION NO. R-2012-17**

**RESOLUTION APPROVING THE WINSTON-SALEM FORSYTH COUNTY  
SOLID WASTE PLAN**

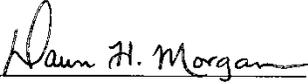
**WHEREAS**, adequately planning for solid waste management and waste reduction will protect public health and the environment, provide for improved solid waste collection and disposal, better utilize our natural resources, and control the cost of solid waste management; and

**WHEREAS**, N.C General Statute 130A-309.09A(b) requires each unit of local government, either individually or in cooperation with other units of local government to develop a 10-year comprehensive solid waste management plan; and

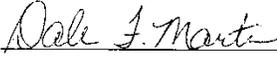
**WHEREAS**, the City-County Utilities Commission compiles the Plan with contributions from all municipalities within Forsyth County.

**NOW, THEREFORE, BE IT RESOLVED** that the Board of Aldermen of the Town of Kernersville hereby, approves the Winston-Salem/Forsyth County Solid Waste Management Plan.

Adopted this 5<sup>th</sup> day June, 2012.

  
Dawn Morgan, Mayor

ATTEST

  
Dale Martin, Town Clerk



## Town of Lewisville

**RESOLUTION 2012020 OF THE LEWISVILLE TOWN COUNCIL  
ADOPTING THE 2012 SOLID WASTE MANAGEMENT PLAN  
OF FORSYTH COUNTY AND THE MUNICIPALITIES OF FORSYTH COUNTY**

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**WHEREAS**, it is a priority of this community to protect human health and the environment through safe and effective management of municipal solid waste; and

**WHEREAS**, the reduction of the amount and toxicity of the local waste stream is a goal of this community; and

**WHEREAS**, equitable and efficient delivery of solid waste management services is an essential characteristic of the local solid waste management system; and

**WHEREAS**, it is a goal of the community to maintain and improve its physical appearance and to reduce the adverse effects of illegal disposal and littering; and

**WHEREAS**, Town of Lewisville recognizes its role in the encouragement of recycling markets by purchasing recycled products; and

**WHEREAS**, involvement and education of the citizenry is critical to the establishment of an effective local solid waste program; and

**WHEREAS**, the State of North Carolina has placed planning responsibility on local government for the management of solid waste; and

**WHEREAS**, NC General Statute 130A-309.09A(b) requires each unit of local government, either individually or in cooperation with other units of local government, to update the Ten Year Comprehensive Solid Waste Management Plan at least every three years; and

**WHEREAS**, the planning period for the current plan is July 1, 2012 to June 30, 2022; and

**WHEREAS**, the Town of Lewisville has undertaken and completed a long-range planning effort to evaluate the appropriate technologies and strategies available to manage solid waste effectively;

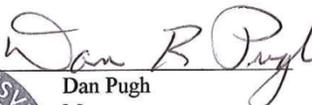
**NOW, THEREFORE, BE IT RESOLVED BY THE GOVERNING COUNCIL OF THE TOWN OF LEWISVILLE:**

**That Forsyth County and the Municipalities of Bethania, Clemmons, Kernersville, Lewisville, Rural Hall, Tobaccoville, Walkertown and Winston-Salem's 10 Year Solid Waste Management Plan for the Planning Period of July 1, 2012 - June 30, 2022 is accepted and endorsed and placed on file with the Clerk to the Board on this 14<sup>th</sup> day of June, 2012.**

ATTEST:

  
Joyce C. McWilliams Walker  
Town Clerk



  
Dan Pugh  
Mayor

# Town of Rural Hall

RESOLUTION #702

## RESOLUTION ADOPTING THE 2012 UPDATE TO THE FORSYTH COUNTY SOLID WASTE MANAGEMENT PLAN

**WHEREAS**, it is a priority of this community to protect human health and the environment through safe and effective management of municipal solid waste;

**WHEREAS**, the reduction of the amount and toxicity of the local waste stream is a goal of this community;

**WHEREAS**, equitable and efficient delivery of solid waste management services is an essential characteristic of the local solid waste management system;

**WHEREAS**, it is a goal of the community to maintain and improve its physical appearance and to reduce the adverse effects of illegal disposal and littering;

**WHEREAS**, the Town of Rural Hall recognizes its role in the encouragement of recycling markets by purchasing recycled products;

**WHEREAS**, involvement and education of the citizenry is critical to the establishment of an effective local solid waste program;

**WHEREAS**, the State of North Carolina has placed planning responsibility on local government for the management of solid waste;

**WHEREAS**, NC General Statute 130A-309.09A(b) requires each unit of local government, either individually or in cooperation with other units of local government, to update the Ten Year Comprehensive Solid Waste Management Plan at least every three years;

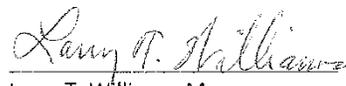
**WHEREAS**, the Winston-Salem/Forsyth County Utilities Commission has undertaken and completed a long-range planning effort to evaluate the appropriate technologies and strategies available to manage solid waste effectively;

**NOW, THEREFORE, BE IT RESOLVED BY THE TOWN OF RURAL HALL BOARD OF COUNCILMAN** that Forsyth County's 2012 Ten Year Comprehensive Solid Waste Management Plan is accepted and endorsed and placed on file with Clerk to the Board on this day, May 14, 2012.

ATTEST:

  
Dora K. Moore, Town Clerk



  
Larry T. Williams, Mayor

# Village of Tobacoville

Resolution #149

## VILLAGE of TOBACCOVILLE

### RESOLUTION ACCEPTING and ENDORSING THE WINSTON-SALEM/FORSYTH COUNTY SOLID WASTE MANAGEMENT PLAN of 2012-2022

**WHEREAS**, better planning for solid waste will help protect public health and the environment, provide for an improved solid waste management system, better utilize our natural resources, and control the cost of solid waste management; and

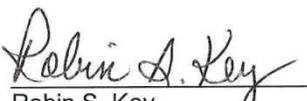
**WHEREAS**, NC General Statute 130A-309.09A(b) requires each unit of local government, either individually or in cooperation with other units of local government, to develop a 10-year comprehensive solid waste management plan and to perform updates to the plan every three years; and

**WHEREAS**, the Village of Tobacoville requested to be represented by the Winston-Salem/Forsyth County solid waste staff;

**NOW, THEREFORE, BE IT RESOLVED BY THE COUNCIL OF THE VILLAGE OF TOBACCOVILLE** that the Winston-Salem/Forsyth County 2012-2022 Ten Year Comprehensive Solid Waste Management Plan is hereby adopted and placed on file with the Clerk to the Council, this the 7th day of June, 2012

  
Billy W. McHone  
Mayor

ATTEST:

  
Robin S. Key  
Village Clerk



**Town of Walkertown**

**TOWN OF WALKERTOWN**

STATE OF NORTH CAROLINA

COUNTY OF FORSYTH

TOWN OF WALKERTOWN



RESOLUTION #12-028

JUNE 28, 2012

**RESOLUTION: TO ADOPT THE FORSYTH COUNTY 10-YEAR SOLID WASTE MANAGEMENT PLAN UPDATE FOR THE PERIOD OF JULY 1, 2012 – JUNE 30, 2022**

**WHEREAS**, NC General Statute 130A-309.09A(b) requires each unit of local government, either individually or in cooperation with other units of local government, to update the Ten Year Comprehensive Waste Management Plan at least every three years; and,

**WHEREAS**, the original Plan, which covered Forsyth County and all incorporated municipalities, was developed by; the City/County Utility Commission in 1997; and,

**WHEREAS**, in June 2009, the Town of Walkertown, by resolution 09-017, approved the Forsyth County 10 Year Solid Waste Management Plan Update prepared for Forsyth County and all incorporated municipalities; and

**NOW THEREFORE, BE IT RESOLVED** that the 2012 Solid Waste Management Plan Update as prepared by City-County Utility Commission for the period of July 1, 2012 – June 30, 2022 is approved and adopted by the Walkertown Town Council.

**RESOLVED AND ADOPTED** this, the 28th day of June, 2012.

**ATTEST BY:**

**TOWN OF WALKERTOWN**

By: *Rusty Sawyer*  
Rusty Sawyer  
Town Clerk

By: *Kenneth R. Davis*  
Kenneth R. Davis  
Mayor



## City of Winston-Salem

D-28303

APPROVED

### RESOLUTION ADOPTING THE 2012 UPDATE TO THE FORSYTH COUNTY SOLID WASTE MANAGEMENT PLAN

**WHEREAS**, N.C. General Statute 130A-309.09A(b) requires all North Carolina Counties to submit updates to their 10-Year Solid Waste Management Plan every three years; and

**WHEREAS**, the last update to the Forsyth County Solid Waste Management Plan was submitted in 2009; and

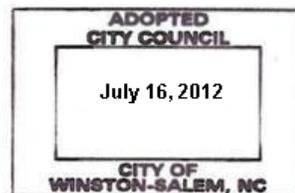
**WHEREAS**, the Utility Department staff compiled the update to the Forsyth County Solid Waste Management Plan for Forsyth County and all incorporated municipalities within the county; and

**WHEREAS**, the above cited statute requires public input into the planning process; and

**WHEREAS**, the Plan has been made available for public review and comment and a public meeting was held on May 14 during the City/County Utility Commission (CCUC) regularly scheduled meeting; and

**WHEREAS**, the Plan was adopted by the CCUC on May 14.

**NOW, THEREFORE, BE IT RESOLVED** by the City Council of the City of Winston-Salem that the 2012 Update to the Forsyth County 10-Year Solid Waste Management Plan is hereby adopted.

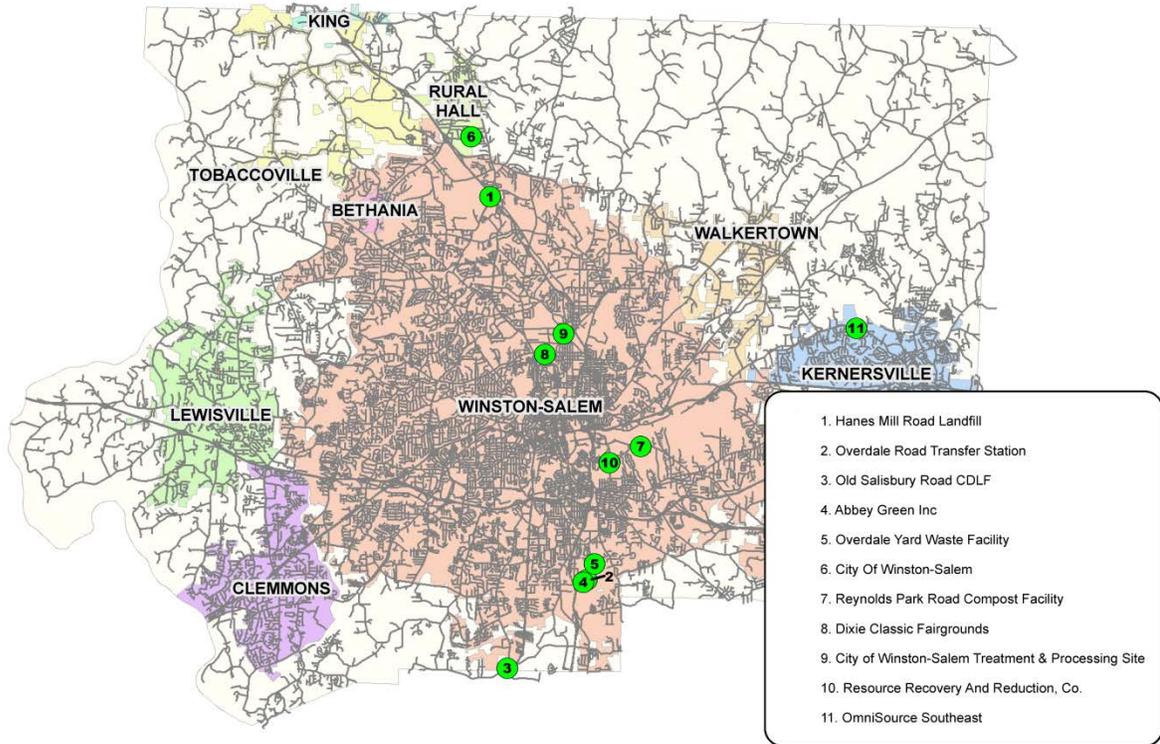


# APPENDIX C-1

## Map of Planning Area

### Location of Municipalities Included in the Solid Waste Management Plan

### Location of Primary Solid Waste Management Facilities



## Forsyth County, North Carolina

## APPENDIX C-2

### Solid Waste Management Facilities in Forsyth County (Excludes LCID)

	Permit Name	Permit #	Waste Type	Operation Type	Location
1	Hanes Mill Road Landfill	3402-MSWLF-1997	MSW	LF	325 W. Hanes Mill Rd., Winston-Salem
2	Overdale Road Transfer Station	3416T-TRANSFER-	MSW	Trans	5000 Overdale Rd., Winston-Salem
3	Old Salisbury Road CDLF	3412-CDLF-1995	CD	Active	336 Old Salisbury Rd., Winston-Salem
4	Abbey Green Inc	3424-TRANSFER-2010	CD	Trans	5030 Overdale Rd., Winston-Salem
5	Overdale Yard Waste Facility	3409-COMPOST-1992	Type I	Compost	4010 Old Milwaukee Lane, Winston-Salem
6	City Of Winston-Salem	3423-COMPOST-	Type I	Compost	180 North Star Drive, Rural Hall
7	Reynolds Park Road Compost Facility	3413-COMPOST-1998	Type I	Compost	Reynolds Park Rd. Winston-Salem
8	Dixie Classic Fairgrounds	3421-Compost-2005	Type III	Compost	421 West 27th St., Winston-Salem
9	City of Winston-Salem Treatment & Processing Site	3425-TP-2011	YW	TP	3 West Thirty-Second St, Winston-Salem
10	Resource Recovery And Reduction, Co.	3415-HHW-2010	HHW	Collection	1401 South MLK, Jr. Dr., Winston-Salem
11	OmniSource Southeast	3420-INDUS-2005	Indus	TP	1426 W Mountain St, Kernersville

## APPENDIX D-1

### Waste Composition at Hanes Mill Rd. Landfill – Residential

No.	Material Description	% Comp.	No.	Material Description	% Comp.
<b>Organic Materials</b>			<b>C&amp;D</b>		
1	Food Waste	17.4%	31	Non-Reinforced Concrete	0.3%
2	Textiles	6.7%	32	Asphaltic Shingles	0.2%
3	Wood (Not C&D)	3.7%	33	Aluminum	0.1%
4	Other/Composite Organic	3.5%	34	Linoleum	0.1%
5	Yard Waste	1.3%	35	Rock	0.0%
6	Manures	0.5%	36	Gypsum Board	0.0%
7	Ag. Crop Residues	0.1%	37	PVC	0.0%
8	Tires	0.0%	38	Asphaltic Concrete	0.0%
<b>Total Organic Materials</b>		<b>33.1%</b>	<b>Total C&amp;D</b>		<b>6.7%</b>
<b>Paper</b>			<b>Inorganics</b>		
9	Other Paper	9.6%	39	Electronics	3.0%
10	Cardboard	3.9%	40	Soil and Fines	2.1%
11	Newspaper	3.9%	41	Other HHW	0.5%
12	Chipboard	3.7%	42	Other Inorganic	0.3%
13	Magazines/Glossy	2.4%	43	Paint	0.2%
14	Office Paper	1.8%	44	Oil/Oil Filters	0.0%
15	Mixed Paper	1.3%	<b>Total Inorganics</b>		<b>6.1%</b>
16	Telephone Books	0.5%	<b>Metals</b>		
<b>Total Paper</b>		<b>27.1%</b>	45	Other Ferrous	1.9%
<b>Plastic</b>			46	Tin/Steel Cans	1.5%
17	Film Plastic/LDPE	9.2%	47	Aluminum Cans	0.7%
18	Other Composite Plastic	4.2%	48	Other Non-Ferrous	0.5%
19	PET Bottles and Jugs	1.9%	49	Other/Composite Metals	0.2%
20	Expanded Polystyrene	1.4%	50	White Goods	0.1%
21	Colored HDPE Bottles and Jugs	0.9%	<b>Total Metals</b>		<b>4.8%</b>
22	Natural HDPE Bottles and Jugs	0.4%	<b>Glass</b>		
<b>Total Plastic</b>		<b>18.0%</b>	51	Clear Bottles/Containers	1.9%
<b>C&amp;D</b>			52	Brown Bottles/Container	1.3%
23	Dimensional lumber	1.6%	53	Green Bottles/Containers	0.6%
24	Pressboard and other sheet lumber	1.2%	54	Other/Composite Glass	0.2%
25	Carpet	0.9%	55	Flat Glass	0.1%
26	Plywood	0.7%	<b>Total Glass</b>		<b>4.2%</b>
27	Reinforced Concrete	0.5%	<b>Special Waste</b>		
28	Other C&D	0.4%	56	Special Waste	0.0%
29	Ferrous Metal	0.4%	<b>Total Special Waste</b>		<b>0.0%</b>
30	Brick	0.3%	<b>Total</b>		
					<b>100.0%</b>

## APPENDIX D-2

### Waste Composition at Hanes Mill Rd. Landfill – Commercial

No.	Material Description	% Comp.	No.	Material Description	% Comp.
<b>Organic Materials</b>			<b>C&amp;D</b>		
1	Food Waste	12.5%	31	Plywood	0.3%
2	Wood (Not C&D)	6.0%	32	Gypsum Board	0.2%
3	Other/Composite Organic	5.1%	33	Rock	0.1%
4	Textiles	4.9%	34	Linoleum	0.1%
5	Ag. Crop Residues	0.8%	35	Aluminum	0.1%
6	Yard Waste	0.7%	36	PVC	0.0%
7	Manures	0.2%	37	Asphaltic Concrete	0.0%
8	Tires	0.2%	38	Reinforced Concrete	0.0%
<b>Total Organic Materials</b>		<b>30.4%</b>	<b>Total C&amp;D</b>		<b>12.2%</b>
<b>Paper</b>			<b>Inorganics</b>		
9	Cardboard	10.0%	39	Electronics	2.6%
10	Other Paper	7.5%	40	Other HHW	1.7%
11	Chipboard	3.2%	41	Soil and Fines	1.4%
12	Office Paper	2.9%	42	Paint	0.6%
13	Newspaper	1.9%	43	Other Inorganic	0.6%
14	Magazines/Glossy	1.9%	44	Oil/Oil Filters	0.0%
15	Mixed Paper	1.1%	<b>Total Inorganics</b>		<b>6.9%</b>
16	Telephone Books	0.4%	<b>Metals</b>		
<b>Total Paper</b>		<b>28.9%</b>	45	Other Ferrous	1.9%
<b>Plastic</b>			46	Tin/Steel Cans	1.1%
17	Film Plastic/LDPE	6.3%	47	Aluminum Cans	0.5%
18	Other Composite Plastic	4.1%	48	Other Non-Ferrous	0.4%
19	Expanded Polystyrene	1.6%	49	Other/Composite Metals	0.0%
20	PET Bottles and Jugs	1.4%	50	White Goods	0.0%
21	Colored HDPE Bottles and Jugs	0.6%	<b>Total Metals</b>		<b>3.9%</b>
22	Natural HDPE Bottles and Jugs	0.3%	<b>Glass</b>		
<b>Total Plastic</b>		<b>14.4%</b>	51	Clear Bottles/Containers	1.3%
<b>C&amp;D</b>			52	Brown Bottles/Container	0.7%
23	Carpet	4.8%	53	Other/Composite Glass	0.3%
24	Dimensional lumber	1.5%	54	Green Bottles/Containers	0.2%
25	Pressboard and other sheet lumber	1.3%	55	Flat Glass	0.0%
26	Brick	0.9%	<b>Total Glass</b>		<b>2.5%</b>
27	Other C&D	0.9%	<b>Special Waste</b>		
28	Non-Reinforced Concrete	0.8%	56	Special Waste	0.8%
29	Asphaltic Shingles	0.8%	<b>Total Other</b>		<b>0.8%</b>
30	Ferrous Metal	0.4%	<b>Total</b>		
					<b>100.0%</b>

## APPENDIX D-3

### Waste Composition at Old Salisbury Road C & D Landfill

No.	Material Description	% Comp.
	<b>C&amp;D</b>	
1	Non-Treated Wood	19.7%
2	Asphaltic Shingles	10.9%
3	Non-Reinforced Concrete	10.4%
4	OCC	8.5%
5	Drywall/Sheetrock	7.0%
6	Plastic (Other Plastic Products)	5.4%
7	Bricks	4.4%
8	Pressboard and Other Sheet Lumber	4.2%
9	Yard Waste	3.9%
10	Rock	3.6%
11	Treated Wood	3.1%
12	Insulation	2.8%
13	Ferrous	2.8%
14	Plastic Film/Wrap/Bags	2.7%
15	Non-Ferrous	2.3%
16	Other	1.8%
17	Paper (Other than OCC)	1.5%
18	MSW	1.4%
19	Dirt/Fines	1.3%
20	Carpet	0.8%
21	PVC	0.4%
22	Linoleum	0.3%
23	Glass	0.2%
24	Durables (Electrical Appliances/Com	0.1%
25	Tile	0.1%
26	Other C&D	0.1%
27	Asphaltic Concrete	0.1%
28	Aluminum	0.0%
29	Tires	0.0%
30	Food Waste	0.0%
31	HHW	0.0%
32	Rubber	0.0%
33	Reinforced Concrete	0.0%
	<b>Total</b>	<b>100.0%</b>

## APPENDIX E

### WASTE REDUCTION GOAL SHEET NC LOCAL GOVERNMENT TEN YEAR SOLID WASTE MANAGEMENT PLAN

Local government name **Forsyth County and included municipalities**

Previously established FY 2018-2019 waste reduction goal **-5%**

After considering your government's current and projected solid waste activities, resources, population and economic growth have you reached your previously established goal? **No**

Establish a new waste reduction goal **-10.0%**

### WASTE REDUCTION CALCULATIONS

To provide 10 years of solid waste management planning, as per General Statute 130A-309.09A(b), waste reduction goals are updated. Use the following chart to determine the tonnages needed to be diverted from landfills in order to reach the new waste reduction goal.

CALCULATION	FY 2018-2019
1. Baseline year disposal rate - 1989-1990 (tons/per capita)	<b>1.34</b>
2. Percent disposal reduction goal from baseline year (per capita)	<b>-10%</b>
3. Targeted disposal rate (tons/capita)	<b>1.21</b>
4. Estimated population for July 2022 (persons)	<b>414,400</b>
5. Calculated disposal at baseline disposal rate (tons)	<b>555,296</b>
6. Targeted annual disposal to meet goal (tons)	<b>499,766</b>
7. Targeted annual disposal reduction to meet goal (tons)	<b>55,530</b>

### WASTE REDUCTION PLAN

See Section 4.3 in Plan

## APPENDIX F

### Summary of Local Government Solid Waste Collection Programs

Program	Bethania	Clemmons	Kernersville
<b>Residential Curbside Recycling</b>	Govt. contract w/Kiser Weekly collection	Govt. contract w/WMI Weekly collection	Municipal Staff Weekly collection
<b>Drop-Off Recycling</b>	None	Cardboard	Cardboard at public & private sites
<b>Special Waste Programs</b>	None	None	e-recycling 1X/year for 2 weeks
<b>Commercial Waste Recycling</b>	Private contract	Private contract & govt. contract w/WMI for M/F units	Private contract & Municipal Staff
<b>Bulky Item Collection</b>	Private contractor Drop-off 1X/year	Municipal staff 1X/year	Municipal staff Quarterly
<b>Yard Waste &amp; Leaf Collection</b>	None	Per schedule Xmas trees	1X/week
<b>Resid. Waste Collection (1x Week)</b>	Govt. contract w/Kiser	Govt. contract w/WMI	Municipal staff
<b>Commercial Waste Collection</b>	Private contract	Private contract & govt. contract w/WMI for M/F units	Municipal staff Private contract
<b>Industrial Waste Collection</b>	Private contract	Private contract	Private contract

## Summary of Local Government Solid Waste Collection Programs

Program	Lewisville	Rural Hall	Tobaccoville
<b>Residential Curbside Recycling</b>	Govt. contract w/WMI, Weekly collection	Govt. contract w/WMI Weekly collection	Govt. contract w/Kiser, Bi-weekly collection
<b>Drop-Off Recycling</b>	Cardboard at Town Hall Annex	None	None
<b>Special Waste Programs</b>	3 R-day collection days/year	None	None
<b>Commercial Waste Recycling</b>	Private contract	Private contract	Private contract
<b>Bulky Item Collection</b>	Volunteers, R-day events 3X/year	1X/week	1X/year, assisted by Village of Clemmons
<b>Yard Waste &amp; Leaf Collection</b>	None Xmas trees	Yes, Xmas trees, pallets	None
<b>Resid. Waste Collection (1x Week)</b>	Govt. contract w/WMI	Contract w/WMI	Govt. contract w/Kiser
<b>Commercial Waste Collection</b>	Private contract	Private contract	Private contract, 96 gal/week paid for by Village
<b>Industrial Waste Collection</b>	Private contract	Private contract	Private contract

## Summary of Local Government Solid Waste Collection Programs

Program	Walkertown	Winston-Salem	Forsyth Co.
<b>Residential Curbside Recycling</b>	Govt. contract w/WMI, Bi-weekly collection	Govt. contract w/WMI, Weekly collection	None
<b>Drop-Off Recycling</b>	None	9 OCC sites at fire stations	3 staffed centers, Pfafftown, Kernersville, Hanes Mill Rd. Landfill
<b>Special Waste Programs</b>	None	Used oil	Used oil collection Permanent HHW collection
<b>Commercial Waste Recycling</b>	Private contract	Private contract & Govt. contract w/WMI	Private contract
<b>Bulky Item Collection</b>	None	Municipal staff 1X/year	None
<b>Yard Waste &amp; Leaf Collection</b>	None	Yard waste, weekly Leaves, seasonal Xmas trees, seasonal	Processing only, no collection Xmas trees, pallets
<b>Residential Waste Collection (1x Week)</b>	Contract w/Waste Industries	Municipal staff	Private contract with govt. franchised haulers
<b>Commercial Waste Collection</b>	Private contract	Municipal staff Private contract	Private contract
<b>Industrial Waste Collection</b>	Private contract	Private contract	Private contract

## APPENDIX G

### Municipal/County Recycling Tonnages by Material Type<sup>22</sup>

Material	Bethania	Clemmons	Kernersville	Lewisville	Rural Hall
<b>Glass</b>	12.4	188.99		136.33	27.21
<b>PETE</b>	4	52.5		19.48	3.89
<b>HDPE</b>	3	21		25.97	6.48
<b>Mixed Plastic</b>					
<b>Al Cans</b>	3	31.52		12.98	2.59
<b>Steel Cans</b>	4	31.52		25.97	5.18
<b>White Goods</b>			13.07		3.87
<b>Other Metal</b>					
<b>ONP</b>	15	629.97		389.53	77.72
<b>OCC</b>		28.08	417.62		
<b>OMG</b>		52.5		25.97	6.48
<b>Office Paper</b>					
<b>Mixed Paper</b>		10.5			
<b>Other Paper</b>		31.52		12.98	
<b>Electronics</b>			8.08		
<b>Commingled</b>		11.68	1,293.56		
<b>Total</b>	<b>41.40</b>	<b>1,089.78</b>	<b>1,732.33</b>	<b>649.21</b>	<b>133.42</b>

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<sup>22</sup> Solid Waste Management Annual Report for FYE 2011, for all named local governments.