

## DRAFT Waste Management Recommendations

### Goal: Extend the Life of the South Wake Landfill

The South Wake Landfill is located between the Towns of Apex and Holly Springs on NC Highway 55. The operating permit from the State of North Carolina allows the South Wake Landfill to only accept municipal solid waste from residents, businesses, industries, and public institutions located within Wake County. The land acquisition process for the South Wake Landfill was initiated in approximately 1988, environmental permit applications were submitted in 1995, the solid waste permit (No. 92-22) was issued on March 2001, and the landfill was placed into service in February 2008. From the initial land acquisition to final startup, 20 years were required to place South Wake Landfill into service.

Prior to proceeding with final development of the South Wake Landfill, in 2004 Wake County conducted a request for proposal (RFP) process to solicit bids for alternative solid waste disposal and conversion technologies. The objective of the RFP process was to determine the least-cost disposal option available for Wake County. The result of the RFP process identified landfill disposal as the least-cost disposal option for residents, businesses, industries, and public institutions in Wake County. Once it was determined that landfill disposal was the least cost solid waste disposal option, Wake County conducted a second request for proposal (RFP) process. The objective of the second RFP process was to solicit landfill disposal bids for in-county disposal using the South Wake Landfill and out-of-county disposal using private landfills located within reasonable hauling distances of Wake County. The result of the second RFP process identified in-county landfill disposal at the South Wake Landfill is the least-cost landfill disposal option for residents, businesses, industries, and public institutions in Wake County.

The South Wake Landfill will be developed in phases and, upon completion, it is anticipated to have a total footprint of 189 acres and a design capacity of approximately 30 million cubic yards of municipal solid waste. Based on the current permitted capacity of the South Wake Landfill (*30 million cubic yards*), the planned compaction rate for waste received (*1,100 pounds per cubic foot*), and the forecasted population growth projections for Wake County, it is estimated that the South Wake Landfill has a life-expectancy of 25 years beginning February 2008.

As the least cost waste disposal option for residents, businesses, industries, and public institutions in Wake County, the Sustainability Task Force desires to develop recommendations that will extend the life of the South Wake Landfill. If the life-expectancy of the South Wake Landfill can be increased beyond 25-years, the community will benefit as follows:

1. The existing, least-cost, efficient, and environmentally responsible waste disposal system will be available to the community for a longer duration.

2. Additional time will be provided to complete the activities (i.e. land acquisition, planning, permitting, design, construction and startup) required to place the next generation waste management system into service; and
3. The capital, operating and startup costs associated with placing the next generation waste management system into service will be deferred.

## Proposed Recommendations

Following are the proposed recommendations for waste management developed by the Sustainability Task Force Waste Work Group. There are five draft recommendations, each with a number of strategies to help accomplish the recommendation.

1. Develop a Food Waste Diversion Program
2. Expand Waste Reduction, Reuse, and Recycling Beyond the Existing Residential Market
3. Increase Construction and Demolition Debris Recycling
4. Evaluate strategies to optimize current landfill resources
5. Initiate Investigations for Next Generation Waste Management System

### 1. Develop a Food Waste Diversion Program

#### Background

The 1999 Waste Characterization Study conducted by Wake County for the North Wake Landfill identified 12.1 percent of the waste received at the North Wake Landfill as food waste. If a portion of food waste can be cost-effectively diverted from landfill disposal, then the life-expectancy for the South Wake Landfill can be extended beyond the currently planned 25-years.

The USEPA and the USDA have worked together to develop a food waste diversion hierarchy that identifies strategies to divert food waste from landfills. The hierarchy applies the concepts of reduce, re-use, and recycle to food wastes. The food waste diversion hierarchy comprises the following activities, with disposal as the last, and least preferred, option:

1. Source Reduction - Reduce the amount of food waste being generated;
2. Feed People - Donate excess food to food banks, soup kitchens and shelters;
3. Feed Animals - Provide food wastes to farmers for animal feed production;
4. Industrial Uses - Provide fats for rendering or fuel production;
5. Composting - Recycle food wastes into a nutrient rich soil amendment; and
6. Disposal – Dispose of food waste in a landfill (current strategy used in Wake County)

## Strategies

Wake County should work with municipalities, large commercial entities (grocery stores), industrial facilities (food processors), institutional facilities (cafeterias), restaurants, and potential end users of food waste recovery (food banks, farmers, landscapers, industries) to evaluate options to divert and use food wastes more cost-effectively in Wake County.

- A. Develop and implement an residential composting program to include:
  1. Educational program
  2. Incentive program for materials needed such as bins, tumblers
- B. Optimize the use of grease waste as biofuel
- C. Develop a Pay-As-You-Throw (PAYT) program to more accurately reflect the costs of waste disposal and increase the amount of food diverted from the landfill
- D. Develop a food diversion and composting pilot program for food and food service providers and measure the outcomes
- E. Evaluate the full costs and benefits of implementing both residential and non-residential composting programs

## 2. Expand Waste Reduction, Reuse, and Recycling Beyond the Existing Residential Market

### Background

In Wake County, municipal governments provide solid waste management programs and services primarily for single-family residential housing units only. Residential recycling within municipal corporate limits is offered as a voluntary program. The recycling rate for single-family residential units in municipal corporate limits ranges from 14 percent to 27 percent. Diversion rates for single-family residential units can be increased by increasing the participation rate, increasing the number and types of materials recycled, and increasing composting of food waste.

Single-family residential units in the unincorporated areas of Wake County have the option to either (a) self-perform waste disposal and recycling services (using one of the County's eleven convenience centers), or (b) purchase waste disposal and recycling services from a private solid waste management company. The average cost for weekly waste disposal and recycling services in the municipal corporate limits of Wake County is approximately \$12.50 per month per resident. The average cost for weekly waste disposal and recycling services in the incorporated portion of Wake County is approximately \$25 per month per resident.

Unlike single-family residential units, municipal governments in Wake County generally do not provide waste disposal and recycling services for multi-family housing units, businesses (retail, restaurants, offices, etc.), industries, and public institutions, nor are targeted recycling education materials usually provided. Waste disposal and recycling services are obtained through individual subscription services negotiated with private sector companies. Similar to the single-family residential units, recycling for this sector is primarily voluntary; however, there are a few regulatory requirements to promote recycling, including the Alcohol Beverage Commission rule (HB 1518) requiring restaurants and bars recycle beverage containers, and Wake County's surcharge on cardboard disposal at the South Wake Landfill.

### Strategies

- A. Identify the collection and processing infrastructure, education, and incentives needed to reduce waste disposal and increase recycling rates for the largest sources of waste disposed by the following target audiences:
  1. single-family housing units
  2. multi-family housing units;
  3. businesses, industries, and public institutions.
- B. Implement a Pay-As-You-Throw (PAYT) pricing approach for waste disposal.
- C. Identify financial incentives that cost less than the current tipping fee of \$32 per ton to divert recyclable materials and reusable materials from landfill disposal.
- D. Continue to adjust the tipping fee at the South Wake Landfill (currently \$32 per ton) to accurately reflect the full cost of service for disposal.
- E. Work with recycling processors in Wake County to increase the types of materials that can be diverted from the waste stream through recycling.
- F. Offer development incentives (parking counts, housing density credits, etc.) and design information to developers who provide recycling facilities in new commercial, residential, and mixed-use projects to promote and encourage recycling and material reuse.
- G. Offer existing developments incentives and design information to retrofit sites to enable recycling.
- H. Update the waste characterization study and include commercial waste. Collect updated information on current markets for materials.

### 3. Increase Construction and Demolition Debris Recycling

#### Background

In Wake County, construction and demolition (C&D) debris is most closely associated with the home building industry. The typical C&D waste includes concrete/masonry, scrap lumber, asphalt shingles, gypsum-based drywall, carpet, and carpet padding. As of 2007, the current C&D debris generation rate in Wake County was estimated to be approximately 580,000 tons per year and of this annual total approximately 90,000 tons per year was recycled for a recycling rate of 15.5 percent. At this time, local governments do not provide any services or facilities for C&D debris disposal. However, there are currently four (4) privately owned and operated C&D debris landfills in Wake County with permitted capacity of 32 million tons, which equates to approximately 60 years of C&D disposal capacity for Wake County. Wake County has been hosting a C&D workgroup to identify barriers to C&D re-use and recycling, and to identify opportunities to increase the recycling and re-use of C&D materials.

#### Strategies

- A. Institute a pilot study to evaluate the costs and benefits of re-using and recycling C&D materials.
- B. Develop education materials such as a fact sheet to inform developers and builders of opportunities and resources for re-using and recycling C&D materials.
- C. Develop and outreach plan for disseminating educational materials to builders and other customers. Include multiple points of contact such as during the permitting process.

### 4. Evaluate strategies to optimize current landfill resources

#### Background

The South Wake Landfill (active landfill) and the Feltonville Landfill (closed landfill) occupy a parcel of land in southwest Wake County that totals approximately 760 acres. The South Wake Landfill will occupy approximately 189 acres when it reaches capacity in 2033. In addition to the South Wake Landfill and the Feltonville Landfill, 760 acre parcel includes a solid waste transfer station, a convenience center, a multi-material recycling facility, and a household hazardous waste disposal facility. In addition, the South Wake and the Feltonville Landfills current generate methane gas from the decomposition of waste, which can be used as a fuel source for energy production facilities.

Given the scope, nature, and scale of resources available at the South Wake and Feltonville Landfills, the County should investigate opportunities to optimize the available resources for the maximum benefit of the community through either private development or public development.

#### Strategies

- A. Provide opportunities to optimize the beneficial use of methane at the South Wake Landfill and Feltonsville Landfill;
- B. Explore the use of available land at the County's existing landfill disposal facilities for implementing alternative technologies for power generation;
- C. Attract private businesses and industries to locate close to the South Wake Landfill to benefit from the proximity to the landfill's resources.

## 5. Initiate Investigations for Next Generation Waste Management System

### Background

New solid waste disposal facilities require a long lead-time (20-years) to complete land acquisition, planning, permitting, design, construction and startup. Although new, the South Wake Landfill has a time-limited capacity of 25-years given current waste management practices. New innovative and alternative waste conversion and disposal technologies have the potential to serve as clean, renewable sources of energy for our growing community

### Strategies

- A. The County should partner with research universities to learn about new technologies and investigate the next generation of waste management facilities that will be implemented to serve the waste disposal or conversion needs of residents, businesses, industries and public institutions in Wake County.
- B. The evaluation criteria should include environmental compliance requirements, quality of service factors (reliability, redundancy, etc.), level of service factors (i.e. accommodate long-term population growth projections), cost-of-service factors (i.e. retain relatively low unit cost of service), and social factors (i.e. equity, environmental justice).
- C. To address potential adverse impacts, the County should consider alternative mitigation measures for individuals that reside adjacent to, or in close proximity to, a solid waste disposal or processing facility.
- D. The evaluation of next generation waste management facilities should consider both in-county and out-of-county options.
- E. The evaluation of next generation waste management facilities should also include an assessment of technology advances that provide for energy production from waste materials generated in Wake County. Such technologies include, but are not limited to, the following:
  - i. Advanced landfill design
  - ii. Waste-to-Energy (produce electricity from incineration of waste)
  - iii. Gasification (produces combustible gas, hydrogen, synthetic fuels)

- iv. Thermal depolymerization (produces synthetic crude oil)
  - v. Pyrolysis (produces combustible tar/bio-oil and chars)
  - vi. Plasma arc gasification (produces hydrogen and CO usable for fuel cells or generating electricity)
  - vii. Anaerobic digestion (Biogas rich in methane) for organic waste components such as food waste, and wastewater treatment facility sludge.
  - viii. Fermentation production (ethanol, lactic acid, hydrogen)
- F. The evaluation of next generation waste management facilities should include a project implementation schedule identifying the various steps to bring a new system online.