KING GEORGE COUNTY
SOLID WASTE MANAGEMENT PLAN
MAJOR AMENDMENT and 2023 Certification Update

Prepared for
King George County, Virginia
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EXECUTIVE SUMMARY

The following Solid Waste Management Plan for the County of King George, Virginia is submitted in accordance with *9 VAC 20-130-10 et seq*. The County has chosen to prepare its Solid Waste Management Plan as a single entity region. The County's solid waste program falls under the umbrella of the Department of Public Works, whose Director reports to the County Administrator, and relies upon contracts with the private sector to manage refuse collection, disposal and recycling.

This Plan is the 2023 certification update of the Plan approved by DEQ on November 12, 2008. The approved Plan was amended in January 2015 as a Minor Permit Amendment as part of the 2013 certification process. Included in this 2023/2024 update is a major amendment for an increase in landfill capacity. This Plan replaces the July 15, 2020 submittal and incorporates the responses to the DEQ December 14, 2023 comments on that document.

As outlined under 9VAC20-130-175.B major amendments are defined as follows:

1. Major amendments shall include:

a. Any addition, deletion, or cessation of operation of any solid waste disposal facility;

b. Any increase in landfill capacity;

c. Any change that moves toward implementation of a waste management strategy that is lower in the waste management hierarchy;

d. Action plans, including an action plan to address a planning unit's recycling rate that has fallen below the statutory minimum; or

e. Any change to membership in the approved area. Director approval of changes to planning unit boundaries, as described in 9VAC20-130-100, shall occur prior to submission of solid waste plan amendments to revise plan membership.

The major amendment to the King George County Plan is triggered by Item b above. The following key item makes the revised Plan a major amendment to the originally approved 2008 plan:

a. Increase in capacity of the King George Landfill SWP 586.
    - Permit modification for increase in capacity approved by DEQ on December 28, 2016.
    - Permitted capacity of the landfill under Permit Modification #15 is 67 million cubic yards. (Original permit included a permit capacity of 45 million cubic yards.)
    - Increased capacity created by increase in landfill height.

The major amendment submittal documentation including the public participation information is included in **Appendix 12.**

A reformat of the original Plan was completed for the 2020 submittal and is carried over here. This document replaces the previously submitted 2020 update. Primarily, sections of the Plan have been moved to the appendices to improve the ease of updating the Plan.

In addition to the day-to-day record keeping, the County, through their Department of Public Works documents their solid waste activities in several ways, as follows:

- Monthly reports to the Board of Supervisors, indicating how the goals and objectives of the program have been met.
- Periodic updates presented to the Board of Supervisors, as requested.
- Annual submittal by March 31 of each year of the Waste Information and Assessment Report (Form 50-25) to DEQ, prepared by the private landfill operator.
- Submittal by April 30 (every 4 years, e.g. 2012/2016/2020/2024 etc per 9VAC20-130-165.B), of the Recycling Rate Report (Form 50-30) to DEQ.
- Annual submittal to DEQ usually by December of each year, of the update for financial assurance, with assistance from the private landfill operator.

All these reports, updates, and DEQ submittals as well as the background information are kept in the central archive (files) of the solid waste program located at the Landfill Facility, 10376 Bullock Drive, King George, Virginia 22485.

The Director of DEQ receives copies of the appropriate information through the following sources:

- Direct submittal to DEQ of Form 50-25 (Waste Assessment) and Form 50-30 (Recycling).
- New permit requests.
- Permit amendments.
- Updates to the Solid Waste Management Plan.
- General correspondence, which may be required from time to time.

Existing Solid Waste Management Program:

In August, 1993, King George County chose to convert from a publicly-owned and operated landfill operation to a publicly-owned and privately-operated facility. The King George County Landfill and Recycling Facility opened in November, 1996 under SWP 586. The 348.5-acre facility is located on an approximately 600-acre parcel abutting Route 665, Route 603, Route 605, and the CSX railroad spur in Sealston.

The facility's design capacity is 67 million cubic yards of waste. The facility offers collection of white goods, waste oil and antifreeze and sponsors two hazardous waste days to allow residents the opportunity to safely dispose of their waste.

The 2023 DEQ annual report for this landfill indicates a remaining life of 18.7 years (from December 31, 2022) or through approximately 2041. The current planning period runs from 2023 through 2043 so the remaining life in the landfill as reported for calendar year 2022, will not meet the County's needs by the end of the period. Over the next 20 years, the County will be in discussions with Waste Management about possible expansions or alternative disposal options. It should be noted that the life expectancy estimate for any landfill is a function of tonnage, material types, cover materials, and compaction, and can vary throughout the life of the facility. As the facility must report its remaining capacity and estimated life annually, the County can review the data and make adjustments to its planning as needed.

Two convenience centers have been developed for MSW and recyclables collection in the County. Operation of the convenience centers has been turned over to the County.

The transfer of all previously disposed materials from the former King George landfill to the new facility began in the spring of 1999. The transfer of all waste was completed by the contractor in 2004.

The Solid Waste Management Program is outlined in **Section 5** and the following Appendices:

- Collection - **Appendix 5**
- Disposal - **Appendix 6-A** and **Appendix 6-B**
- Recycling - **Appendix 7**
- Litter Control – **Section 5.4** and **Section 8.4**

Goals and Objectives for Waste Management:

Even with a successful program that encompasses collections, recycling and disposal as outlined above already in place, the County continues to consider ways to improve their program. Goals for the program include the following:

The County plans to continue improvements to the program as the County Board of Supervisors expresses interest, as markets open up, and as funding is made available. A majority of the items so noted do not have specific tasks or projects identified at this time but represent on-going activities already incorporated into the program.

Section 8.0 describes the future long-term goals for the program in greater detail and includes a list of action items.

King George County has developed and adopted this Solid Waste Management Plan for the following reasons:

- To protect the health, safety, and welfare of their residents by providing and planning for their present and future solid waste disposal needs.

- To protect the environment from the mismanagement of solid waste.
- To provide for the efficient and economical disposal of the solid waste.
- To promote recycling activities in King George and comply with the state-mandated recycling rates of 25 percent.
- To minimize the amount of solid waste landfilled to preserve valuable and limited landfill space.
- To develop an integrated approach for the handling and disposal of solid waste.
- To use limited natural resources effectively and efficiently.
- To comply with State Regulations *(9 VAC 20-130-10 et seq)*.

This Plan supports the King George County Comprehensive Plan[1], dated 2019, which presents the following Goals and Polices regarding Solid Waste.

Goals for Community Services and Facilities within the County:

- Provide and develop long term, safe and economical disposal of the solid waste generated in King George County.'
- Ensure all solid waste is handled efficiently, at low cost, and in an environmentally responsible manner.

Policies for Community Services and Facilities within the County:

- Develop long term and contingency plans for waste disposal.
- Encourage economically viable recycling of all materials in the solid waste disposal activity.
- Support and encourage roadside cleanup activities.
- Provide recycling facilities at all transfer stations.
- As population increases, provide additional solid waste transfer stations.
- Encourage low impact recycling industries in conjunction with the landfill operation.
- Continue to provide a hazardous waste collection day to give residents an opportunity to safely dispose of their waste.

[1] *King George County Comprehensive Plan, October 1, 2019*
https://www.kinggeorgecountyva.gov/documentcenter/view/4812

1.0 INTRODUCTION

King George County has been approved as a Planning Unit by the Virginia Department of Environmental Quality (VDEQ or DEQ). As an approved Planning Unit, must maintain a current Solid Waste Management Plan in accordance with the Virginia Solid Waste Planning and Recycling Regulations, *9VAC20-130-10 et seq*.

Solid Waste Management Plans are required to be updated every five years based on the original date of approval by VDEQ, or amended when significant solid waste management activities occur in the Planning Unit. The original Plan prepared by Draper Aden Associates (DAA) and dated December 29, 1991 was updated by the County on September 6, 1999, and by DAA in 2005. The Plan approval date was November 12, 2008.

The approved Plan was updated by DAA in 2015, as a SWMP minor amendment and as part of the 2013 certification process. Our records do not show that the 2015 submittal was ever acted on by DEQ.

The following document is the 2023 certification update of the Plan approved in 2008 by DEQ and amended in January 2015 for a Minor Permit Amendment. Included in this update is a major amendment for an increase in landfill capacity. This Plan replaces the July 15, 2020 submittal and incorporates the responses to the DEQ December 14, 2023 comments on that document as discussed in a February 16, 2024 call.

As outlined under 9VAC20-130-175.B major amendments are defined as follows:

1. *Major amendments shall include:*

   a. Any addition, deletion, or cessation of operation of any solid waste disposal facility;

   b. Any increase in landfill capacity;

   c. Any change that moves toward implementation of a waste management strategy that is lower in the waste management hierarchy;

   d. Action plans, including an action plan to address a planning unit's recycling rate that has fallen below the statutory minimum; or

   e. Any change to membership in the approved area. Director approval of changes to planning unit boundaries, as described in 9VAC20-130-100, shall occur prior to submission of solid waste plan amendments to revise plan membership.

The major amendment to the King George County Plan is triggered by Item b above. The following key item makes the revised Plan a major amendment to the originally approved 2008 plan:

a. Increase in capacity of the King George Landfill SWP 586.
   - Permit modification for increase in capacity approved by DEQ on December 28, 2016.

- Permitted capacity of the landfill under Permit Modification #15 is 67 million cubic yards. (Original permit included a permit capacity of 45 million cubic yards.)
- Increased capacity created by increase in landfill height.

This Plan will replace the previous document submitted on July 15, 2020 for which comments were received on December 14, 2023. This Solid Waste Management Plan has been prepared for King George County in accordance with regulatory requirements *(9VAC20-130-175)*. Documentation adopting the plan as required by the regulations can be found in **Appendix 10** and **Appendix 12**.

1.1 Legislation

The following Solid Waste Management Plan has been prepared in accordance with the Virginia Waste Management Board's Regulations for Solid Waste Management Planning, *9 VAC 20-130-10 et seq.,* as amended.

1.2 Authority *(9 VAC 20-130-20)*

The regulations were promulgated pursuant to Chapter 14 *(Sec.10.1-1400 et seq.)* and specifically Sections *10.1-1402, 10.1-1411* and *10.1-1413* of Title 10.1 of the Code of Virginia, which authorized the Virginia Waste Management Board to promulgate and enforce such regulations as may be necessary to carry out its duties and power, and the intent of the Virginia Waste Management Act and the federal acts.

1.3 Purpose *(9 VAC 20-130-40)*

The purpose of the regulations as generally stated in *9 VAC 20-130-40* and elsewhere in the regulations is to:

1. Establish minimum solid waste management standards and planning requirements for protection of public health, public safety, the environment, and natural resources throughout the Commonwealth;
2. Require the development of a comprehensive and integrated Solid Waste Management Plan that addresses all components of the solid waste hierarchy established by the United States Environmental Protection Agency (EPA) as embraced by the Commonwealth as follows:
    - Source Reduction (most desirable activity)
    - Reuse
    - Recycling

- Resource Recovery (waste-to-energy)
- Incineration
- Landfilling (least desirable activity)

3. Promote local and regional planning that provides for environmentally sound and compatible solid waste management with the most effective and efficient use of available resources;
4. Establish procedures and rules for designation of regional boundaries for Solid Waste Management Plans;
5. Establish state, local government, or regional responsibility for meeting and maintaining the minimum recycling rates of 25%;
6. Establish the requirement to withhold permits for failure to comply with the regulations;
7. Provide a method to request reasonable variance or exemptions from the regulations;
8. Provide for reporting and assessment of solid waste management in the Commonwealth.

1.4 Recycling

9VAC20-130-125 (Recycling Requirements) states the following:

> *A. Each solid waste planning unit shall maintain a minimum recycling rate for municipal solid waste generated within the solid waste planning unit pursuant to the following schedule:*
>
> > *1. Except as provided in subdivision 2 of this subsection, each solid waste planning unit shall maintain a minimum 25% recycling rate; or*
> >
> > *2. Each solid waste planning unit shall maintain a minimum 15% recycling rate if it has (i) a population density rate of less than 100 persons per square mile according to the most recent United States Census or (ii) a not seasonally adjusted civilian unemployment rate for the immediately preceding calendar year that is at least 50% greater than the state average as reported by the Virginia Employment Commission for such year*

The most current US Census is the 2020 census, which indicated that the County had a population of 26,783. The County has a reported size of 183 square miles and thus 146 persons per square mile. It must therefore, meet the 25% recycling goal. Because the County has a population of less than 100,000 people, the County must only report recycling information to VDEQ every four years (2012/2016/2020/2024 etc), although it is required to keep accurate statistics for recycling during the intervening years.

1.5 Planning Area

The planning area for this Solid Waste Management Plan is the County of King George, Virginia. The County is part of the George Washington Regional Commission (GWRC) Planning District, but has elected to prepare this Solid Waste Management Plan separately from the planning district. See **Appendix 1-A** for a vicinity map indicating the location of the County within Virginia.

The following figures are provided in **Appendix 1-A**:

- Figure 1 - Location Map[2]
- Figure 2 - Area Map[3]
- Figure 3 - Location of County Convenience Centers Map[4]
- Figure 4 –GIS Map of County Zoning[5] Land Use Guide from 2019 Comprehensive Plan

1.6 Planning Period

The planning period for this Solid Waste Management Plan is 20 years from 2023 – 2043.

1.7 Definitions

Definitions relating to solid waste management are included in the *Virginia Solid Waste Management Regulations - 9VAC20-81-10*.

Definitions relating to Solid Waste Management Planning are also included in the *Virginia Solid Waste Planning and Recycling Regulations - 9VAC20-130-10*.

[2] Appendix 1 - A Map of County Location
[3] Appendix 1 - B Map of Area
http://www.onlinegis.net/KingGeorgeCountyVA/Map.html
[4] Appendix 1 - C Location of County Convenience Centers
[5] Appendix 1 - D County Zoning

2.0 BACKGROUND INFORMATION

To provide background to the discussions contained in this Solid Waste Management Plan, a discussion of the status of solid waste management nationally and an overview of the key points of the County's Solid Waste Management Plan amendment dated January 13, 2015, and the modification dated September 6, 1999, and revised in March 15, 2005, are being provided in this Section.

2.1 Status of Solid Waste Management Nationally

For information on the status of solid waste nationally **Appendix 2-A** contains the EPA 2017 Advancing Sustainable Materials Management: Facts and Figures Report. For the latest published information from the United States Environmental Protection Agency with regard to solid waste management in the US, the EPA website[6] should be consulted as interest dictates.

2.2 Highlights from 2015 Solid Waste Management Plan

The County submitted a minor amendment to their solid waste plan in June 2015. This can be provided upon request. A summary of proposed specific actions by the County is provided below as stated in the County's revised 2015 plan developed by Draper Aden Associates:

- Continue the twice-yearly Household Hazardous Waste collection program, and expand as desired by the County Board of Supervisors
- Continue to utilize the landfill operated by a supervised waste management operator
- Expand landfill as needed to maintain disposal capacity
- Continue to monitor the facility operation via County staff
- Develop the remaining convenience center planned for the County. Provide recycling facilities at all transfer stations. *The County has determined not to develop a third convenience center.*
- Develop database for recycling by the commercial / industrial sector
- Encourage low impact recycling industries in conjunction with the landfill operation.
- Develop educational programs for the commercial / industrial sector and develop outreach program
- Continue to develop educational programs for the County's residents
- Support and encourage roadside cleanup activities
- Be opportunistic for private and commercial entities through economic development

[6] https://www.epa.gov/facts-and-figures-about-materials-waste-and-recycling

This work is on-going, with the County tasked with annually reporting progress during budget planning activities.

3.0 DEMOGRAPHIC DATA

Refer to the King George County Comprehensive Plan[7] for in-depth information and demographic data as well as goals and action plans for the following sections.

3.1 Location

King George County is located in northeastern Virginia at the entrance to the Northern Neck peninsula. The County's northern boundary is formed by the Potomac River; the southern boundary is the Rappahannock River. To the west is Stafford County; and to the east is Westmoreland County. The County's 183 square miles are predominantly in the Coastal Plain with the topography ranging from flat to gently rolling terrain.

3.2 Population

King George County is located within the Fredericksburg metropolitan area, which is experiencing rapid growth as development expands along the I-95 corridor from Northern Virginia, and due to the independent growth of the region. Existing population information from 2000 to 2023 is provided in **Appendix 3-A.** Population projection information for the planning period is given in **Appendix 3- B** for 2024 through 2050. For greater background on County demographics refer to the source for the population estimate data the Weldon Cooper Center for Public Service[8]. The VEC Community Profile for King George County[9] is provided in **Appendix 3-C.**

3.3 Geographic Conditions

3.3.1 Geographic Setting

King George County is located within the Atlantic Coastal Plain region of Virginia. The County contains 183 square miles and is bounded by Stafford County to the west, Westmoreland County and Essex County to the east, the Potomac River to the north and the Rappahannock River to the south. It is known as the "*Gateway to the Northern Neck*" with 131 miles of shoreline, acres of unspoiled natural beauty, myriad cultural diversities, and historic wealth. Of the County's 113,920 acres, nearly 73,000 are forested, and over 38,000 acres are agricultural. It is a regional leader in pro-active and progressive planning, development and governmental services.

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[7] *King George County Comprehensive Plan, October 1, 2019*
https://www.kinggeorgecountyva.gov/documentcenter/view/4812
[8] https://demographics.coopercenter.org/
[9] https://virginiaworks.com/community-profiles

3.3.2 Physiography

King George County is located in the Coastal Plain Physiographic Province. The bedrock of this area "*is made up of partially consolidated sedimentary rocks that dip generally to the east at slightly steeper angles than the slope of the overall surface. The rocks consist of Cretaceous, Eocene, and Miocene marine sands (some of which contain fairly large percentages of glauconite), gravels, clays (a few of which are lignitic), shell marls, and diatomaceous sediments. In places the rocks are overlain by Pleistocene, Recent, and possibly Pliocene sand and gravel veneers, some of which constitute marine terraces formed when the level of the ocean was higher.*"'

3.3.3 Climate

King George enjoys a temperate climate with the area generally having warm summers and mild winters. Monthly temperatures range from an average low of 36.7 degrees in January to an average high of 76.0 degrees in August. The growing season averages 222 days, lasting from April to October. The area has an average extreme frost depth of 18 inches. Average annual precipitation is 41.7 inches. Average annual snowfall is about 18 inches.

3.4 Transportation

King George County is approximately 83 miles southeast of Washington; 60 miles north of Richmond; and 143 miles northwest of Norfolk. The County is served by major transportation routes including I-95 and Route 301, providing access to the Metropolitan Washington D.C. area and Baltimore, Maryland. Route 301 and Route 3 intersect in King George County. Route 3 connects I-95 and Fredericksburg to the west with the rest of the Northern Neck to the east. Route 301 offers crossings of both the Potomac River to the north and the Rappahannock River to the south.

CSX runs a north-south rail line generally along the I-95 corridor and passes just to the east of the City of Fredericksburg, and through Falmouth. From Falmouth, CSX also operates an east-west rail spur that runs generally along Rt. 3, near the current landfill site, and truncates before reaching the County seat of King George.

The Port of Hampton Roads is 125 miles southeast of King George. The port's 50-foot deep channels are located just 18 miles from the open sea, with mild climates guaranteeing ice-free conditions year-round. The Port of Richmond is approximately 60 miles south of King George.

See the County's Comprehensive Plan[10] for more information on transportation plans and goals.

[10] *https://www.kinggeorgecountyva.gov/documentcenter/view/4812*

3.5 Utilities and Services

Water and sewer services are operated by the King George County Service Authority. Electricity is offered by Dominion Virginia Power and the Northern Neck Electric Cooperative. Natural gas service is currently not available from Colombia Gas of Virginia. The County offers solid waste and recycling collection at 2 convenience centers and household hazardous waste collection twice a year.

See the County's Comprehensive Plan for more information on utilities and services plans and goals.

3.6 Economic Growth

King George County is a transitioning rural county with the third fastest growth rate in the state. The County has a diversified economy with strong military, services, manufacturing, retail trade and agricultural sectors.

The U.S. Naval Surface Warfare Center Dahlgren Division (Dahlgren Naval Station) plays a leading role in the County's economy infusing over a billion dollars into the regional economy annually. The County is also traversed by two major thoroughfares (US Routes 3 and 301) and includes a growing state of the art fiber optics and telecommunications network.

Agriculture remains important in the County's economy. As of the last assessment there were 200 agricultural parcels containing greater than 100 acres. The King George Gateway Shopping Center has been completed and is home to a Walmart Supercenter, Auto Zone, In First FCU, Five Guys Burgers and Fries, Hair Cuttery, GameStop, Verizon, Peebles, Dollar Tree, Rue21, UPS store, Good Will, Starbucks Drive-thru and many other smaller retail and food establishments. The County has an active Economic Development Authority (EDA), which has developed an industrial park and is aggressively marketing the County.

See the County's Comprehensive Plan[11] and The County's Annual Fiscal Plan[12] for more information on economic growth.

[11] https://www.kinggeorgecountyva.gov/documentcenter/view/4812
[12] https://www.king-george.va.us/184/Financial-Reports-Documents

3.7 Land Use

The majority of King George County is rural and used for residential or agricultural purposes.

There are several small communities located throughout the County, but no major population centers. Generally, the importance of agriculture to the economy of King George County has been diminishing while the importance of the Federal Government, through the Naval Surface Warfare Center (NSWC), has been increasing. The NSWC and its associated activity are the driving force behind the economy of King George County. In addition to the dollars the base directly pumps into the local economy, businesses and service industries have tended to locate along the major transportation links near the NSWC in order to serve the NSWC's needs.

See the County's Comprehensive Plan for more information on land use goals and future planning of the County.

4.0 WASTE GENERATION AND COMPOSITION

King George County utilizes a regional landfill that is owned by the County but operated under a long-term contract with a private operator. The facility manages waste generated within the County, and imports waste from other jurisdictions and industries located outside of the County. The operations contract requires the private operator to not only manage the disposal facility, but a household hazardous waste collection and disposal operation, mulching operation for yard waste, and recycling services. While the County has excellent records of the waste collected through the County convenience center system, it does not have records of the waste collected by the private sector from commercial and industrial establishments, or residential waste collected through individual accounts with the private sector, and delivered to the landfill facility.

4.1 Historical Waste Generation

The total tonnage of MSW generated in King George County for the 2001 to 2020 time period is provided in **Appendix 4-A**. The source of the data on County waste generation is tracked in the DEQ Recycling Rate Reports so not all years in the range above are included in the table.

Collection in King George County is privatized in several ways. The County does not handle any collection or disposal activities and hence has no mechanism for tracking wastes or special wastes generated within the County. The waste collected by the private haulers within the County are delivered to the private landfill where they are tracked by locality/state of origin.

4.2 Projected Waste Generation Rates

Assuming that waste generation can be generally correlated with population growth and based on the average per capita projections published by the US EPA Fact Sheet 2017.[13] A 4.5 pounds pers person per day EPA generation rate was used to project waste generation for 2019, 2020, 2025, 2030, 2035, 2040, 2045, and 2050. This information is included in **Appendix 4-B**.

4.3 Waste Composition

The breakdown of projected waste generation by category is provided in **Appendix 4-C.** The County does not generate significant quantities of unusual or special wastes; therefore, its composition would be assumed to be similar to the national estimates discussed in **Section 2.1**. The County tracks *Virginia Solid Waste Management Regulations* special wastes under its recycling programs. Quantities of these materials are reported in the Recycling Rate Reports for the years 2012, 2016, 2018 and 2020 attached in **Appendix 4-D, Appendix 4-E**, **Appendix 4-F** and **Appendix 4-G.**

[13] https://www.epa.gov/facts-and-figures-about-materials-waste-and-recycling

5.0 EXISTING SOLID WASTE MANAGEMENT SYSTEM

The following section describes the major components of the County's current solid waste management system in existence in 2013 and updated for 2023.

5.1 Collection

The County does not provide collection services. However, it does operate 2 convenience centers. Operation of the convenience centers has been turned over to the County. The County has determined not to develop a third convenience center.

See **Appendix 5** for a detailed description of the current collection activities and the future goals for the program. This appendix also includes a methodology for evaluating the solid waste collection system.

5.2 Disposal

The County currently uses the King George Sanitary Landfill and Recycling Center (Permit #586).

Under the major modification #15 to SWP 586, approved by DEQ on December 28, 2016, the landfill permit indicated a remaining life of 28 years or through 2045. The 2023 DEQ annual report for this landfill indicates a remaining life of 18.7 years (from December 31, 2022) or through approximately 2041. The current planning period runs from 2023 through 2043 so the remaining life in the landfill as reported for calendar year 2022, will not meet the County's needs by the end of the period. Over the next 20 years, the County will be in discussions with Waste Management about possible expansions or alternative disposal options. It should be noted that the life expectancy estimate for any landfill is a function of tonnage, material types, cover materials, and compaction, and can vary throughout the life of the facility. As the facility must report its remaining capacity and estimated life annually, the County can review the data and make adjustments to its planning as needed.

See **Appendix 6-A** for detailed information on disposal. The King George County landfill permit is included in **Appendix 6-B**.

5.2.1 Previously operated or permitted landfills

Prior to the permitting of the current landfill, the County had operated one other permitted landfill and one transfer station. This landfill operated under Permit Number 005 from the former State Department of Health (permitted in 1972). It was an unlined facility located near the intersection of Rt. 3 and Purkins Corner. Under the new landfill operations agreement with Waste Management, the company was responsible for exhuming the entire waste content of the old

landfill and placing the waste into the new landfill, Permit #586. The total quantity of waste exceeded 1.1 million tons, and the operation was completed in 2006, and subsequently the old landfill site was graded. In 2008 the site was demonstrated to have achieved clean closure and post-closure monitoring, and was terminated by the Department.

The transfer station (PBR #059) ceased operation in the mid-1990s, and the permit was formally revoked by the Department on September 19, 2007. A convenience center and recycling drop-off facility is now sited on property adjacent to the parcel the landfill (SWP#005) once occupied.

5.3 Recycling

King George County, like most areas, has both publicly and privately sponsored recycling programs operating within it. **Appendix 7** provides additional information on the County's current recycling program.

5.4 Litter Control

King George County has adopted anti-litter laws, which are enforced. These laws were adopted to discourage unlawful littering throughout the County.

The Virginia Department of Transportation (VDOT) sponsors an Adopt-a-Highway program in King George County. VDOT's program was implemented to encourage residents, civic organizations, and other groups to beautify and maintain public rights-of-ways. The person or group that has adopted a highway, collects litter from the roadside and places it in bags provided by VDOT. VDOT personnel then collect the bags and deliver them to the King George landfill for disposal.

King George County is currently pursuing a partnership with surrounding counties to step up litter prevention programs. The intent of this partnership is to work together on a regional basis to control litter problems. This partnership should add strength to the litter prevention efforts for all the communities involved.

King George County hopes to encourage enforcement of anti-litter laws, improve recycling efficiency and continue to participate in volunteer clean-up events during the planning period.

5.5 Treatment

The County does not currently treat municipal solid waste, nor is treatment planned for the future.

5.6 Public Education

5.6.1 Residential

King George County holds public hearings on all major issues related to solid waste management. New programs are advertised in the local newspapers and brochures distributed. Residents are encouraged to become involved with local solid waste issues and programs. King George previously created a Solid Waste Management Planning Ad Hoc Committee who developed a guideline report "*King George County Solid Waste Management Plan Phase 1 Report*", and currently has an appointed Landfill Advisory Committee. By keeping its residents fully informed, King George believes that resident support for their programs can be maintained, and their programs improved.

The County coordinates outreach in the public school system in an effort to promote recycling and environmental awareness. In addition to the education programs sponsored by King George County, the Virginia Department of Environmental Quality and the United States Environmental Protection Agency have programs directed at educating people on solid waste management issues. These programs include publications, which are widely available, maintaining information hotlines, and sponsoring seminars and conferences.

5.6.2 Industrial/Commercial

The County does not currently have any specific outreach program that educates businesses in the areas of recycling, reuse, or waste reduction techniques.

5.7 Public/Private Partnership

The County serves as a model for effective partnership with the private sector. Under the master landfill operations agreement with Waste Management Inc., (WMI) the County utilizes the significant resources of a major corporation to assist it in meeting its waste management goals. Currently, the County contracts with WMI for the following:

- Removal of all waste (1.1 million tons) from the old King George County landfill and dispose of the materials in a subtitle D compliant landfill.
- Development of a recreational park at the old landfill site.
- Design and development of the County's 2 convenience sites and recycling drop-off centers.
- Operation of the convenience centers is turning over to The County from WMI.
- Operation of the County's household hazardous waste collection facility, and disposal of the materials collected.
- Mulching of yard waste delivered to the landfill site by County residents.

- Payment of a host fee for use of the landfill facility.
- Payment of an Inspector fee to County
- Beneficial use fee for use of coal ash as alternate daily cover.

These activities are further described in the appropriate sections of the Plan. Other activities may be negotiated with WMI, to further enhance the County's solid waste management program.

5.8 Solid Waste Evaluation

The County continuously evaluates their system for improvements.

Periodically, the County assesses the effectiveness of its collection system (there are no transfer stations in the system). This system is semi-privatized with the County providing operations for two convenience centers, and residents, businesses, and industries contracting directly with private collection companies. In reviewing the system the County may consider such items as:

- Budget
- Contracts
- Equipment Needs
- Personnel
- Effectiveness
- Aesthetics
- Complaints over previous year
- Traffic or entrance issues
- Safety
- Location of disposal facilities

This assessment is completed informally. If it appears that modifications to the system are needed, recommendations will be made to the governing body and action taken as necessary. Recommendations may include the following information:

- Description of change
- Background on need for change
- Evaluation of infrastructure needs
- Evaluation of potential contractual requirements
- Recommendations for method of implementation
- Schedule
- Regulatory requirements
- Costs and budget requirements
- Revenue sources to fund change.

5.9 Central Archive

In addition to the day-to-day record keeping, the County, through their Department of Public Works, documents their solid waste activities in several ways, as follows:

- Monthly reports to the Board of Supervisors, indicating how the goals and objectives of the program have been met.
- Periodic updates presented to the Board of Supervisors, as requested.
- Annual submittal by March 31 of each year, of the Waste Information and Assessment Report (Form 50-25) to DEQ, prepared by the private landfill operator.
- Submittal by April 30 (every 4 years, e.g. 2012/2016/2020/2024 etc per 9VAC20-130-165.B), of the Recycling Rate Report (Form 50-30) to DEQ.
- Annual submittal to DEQ usually by December of each year, of the update for financial assurance, with assistance from private landfill operator.

All these reports, updates, and DEQ submittals as well as the background information are kept in the central archive (files) of the solid waste program located at the King George Landfill, 10376 Bullock Drive, King George, Virginia 22485.

The Director of DEQ receives copies of the appropriate information through the following sources:

- Direct submittal to DEQ of Form 50-25 (Waste Assessment) and Form 50-30 (Recycling).
- New permit requests.
- Permit amendments.
- Updates to the Solid Waste Management Plan.
- General correspondence, which may be required from time to time.

6.0 BUDGET

The County's budget information[14] is provided in further detail in **Appendix 8.**

6.1 Operating Budget

King George County enjoys a competitive real estate tax rate, in part due to its partnership with the private sector relative to its solid waste management program. The County pays no disposal fees, and its contract with Waste Management, Inc. requires the contractor to coordinate the recycling program, and convenience center design. The County's solid waste program is fully funded through this relationship.

6.2 Revenues

Landfill revenues are an important source of funds for the County. This source of funds has afforded the County the opportunity to upgrade and expand facilities while retaining a lower real estate rate. Landfill revenues have traditionally been restricted for financing capital projects, which primarily takes the form of debt service. The contractor is responsible for any landfill closure and post closure costs. As of June 30, 2023 the County set aside escrow funds in the amount of $4,351,844 to cover potential liabilities related to any landfill closure and post closure costs, which may result from the contractor's ineligibility to cover such costs.

Waste Management, Incorporated operates a landfill in the County that accepts waste from Virginia and states north of the Commonwealth. The County receives $5 for every ton of waste accepted at the facility. With the approval of the landfill expansion in 2016 by DEQ, the County will receive an additional $1/ton for every ton received once the landfill operation begins to use the expansion capacity. For FY 2023, landfill revenues (from host fees) were $4.6 million. An additional $0.5 million was paid to the County for costs associated with the permit expansion permitting.

6.3 Capital Improvement Program

The County does not anticipate additional facilities at this time.

[14] https://www.king-george.va.us/184/Financial-Reports-Documents

7.0 WASTE MANAGEMENT HIERARCHY

Under *9 VAC 20-130-30*, the following policy is set forth:

"It is the policy of the Virginia Waste Management Board to require each region designated pursuant to 9 VAC 20-130-180 through 9 VAC 20-130-220, as well as each city, county and town not part of such a region, to develop comprehensive and integrated Solid Waste Management Plans that, at a minimum, consider and address all components of the following hierarchy:

1. *Source reduction*
2. *Reuse*
3. *Recycling*
4. *Resource recovery (waste to energy)*
5. *Incineration*
6. *Landfilling"*

Section *9 VAC 20-130-120.C.6*, also addresses this requirement by stating:

"The local government or regional Solid Waste Management Plan shall include data and analyses of the following type for each jurisdiction. Each item below shall be in a separate section and labeled as to content:

> *6. A description of programs for solid waste reduction, reuse, recycling, resource recovery, incineration, storage, treatment, disposal and litter control."*

The following sections provide the information as available as required by the regulations.

7.1 Source Reduction

Source reduction refers to any change in the design, manufacture, purchase, or use of materials or products (including packaging) to reduce their amount or toxicity before they become municipal solid waste. Source reduction can help reduce waste disposal and handling costs, conserve resources, and reduce pollution. **Section 2.1** and **Appendix 2-A** previously discussed the trends in source reduction nationally noting that the reduction of yard waste in landfills is the most significant source reduction activity at the moment as localities and states ban yard waste from landfills.

While individuals can attempt to reduce their volume of waste, source reduction policies will be aimed primarily at businesses and industries. Many source reduction policies are not feasible at the local level but are best handled at the state or federal level. An example of this is the banning of yard waste from landfills, or requiring minimum packaging standards. Financial incentives and disincentives, broad regulations concerning source reduction and changes to manufacturing processes are difficult to implement on a local basis.

As waste tipping fees increase at the landfill and the outside facilities, the commercial sector will become more sensitive to the expenses involved in their disposal programs, and will begin to consider source reduction more closely.

The most effective source reduction activity that can occur at the local level is public education. As documented in **Section 5.6**, the County conducts an active public education program.

7.2 Reuse

Reuse is similar to source reduction as it prevents materials from entering the waste stream, but involves separating a given solid waste material from the waste stream and using it, without processing or changing its form, other than size reduction, for the same or another end use. Examples of reuse include such activities as swap shops or thrift stores, clothing collection centers, pallet reuse, use of refillable bottles and reconditioning of drums or barrels.

As with source reduction, private citizens can make an effort to reuse or encourage reuse of many items that would normally be discarded to the landfill. However, the focus of the program would be better aimed at the commercial sector including the County's businesses and industries. The County does not currently focus their educational programs on the commercial sector and does not currently collect specific information on reuse by the commercial sector.

Currently reuse centers such as the Salvation Army are available to the public in the local region (Fredericksburg).

The following activities are proposed under this plan relative to reuse, as interest and funding are available:

- Continue to educate public relative to the need for reuse,
- Educate the commercial sector to address reuse,
- Collect data on commercial reuse programs.

7.3 Recycling

Recycling is the process of separating a given waste material from the waste stream and processing it so that it may be used again as a raw material for a product, which may or may not be similar to the original product. **Section 5.3** and **Appendix 7** outlined the recycling activities in the County extensively. Highlights from this section include the following:

- For calendar years 2012, 2016, 2018, and 2020, the County collected a total of 62,784 tons of principal recyclable materials from their program, as follows:
    - Paper

  - Metal
  - Plastics
  - Commingled
  - Yard Waste
  - Wood Waste
  - Waste Tires
  - Used Oil
  - Batteries

- For calendar years 2012, 2016, and 2018, 363,885 tons of coal ash was collected and reused as alternate daily cover. In the future, much of this ash will be utilized to produce cinderblock. In 2016, 273,284 tons of ash were reused as cover. In 2018 ash alternate cover was down to 52,580 tons. In 2020, coal ash was not listed as the County no longer uses coal ash for ADC. The local power plant was decommissioned and a source of coal ash no longer available.

- For calendar year 2020, 27,558 tons of tire chips and 40,348 tons of glass were listed as having been used for alternate daily cover.

Between 2008 and 2012, the County's recycling rate ranged from 20% to 44%. In 2016, the rate was reported as 56%; in 2018, the rate was reported as 54%; in 2020 the rate was reported as 31.8%. The current recycling efforts are proposed to continue.

7.4 Resource Recovery and Incineration

Resource recovery refers to a system that provides for collection, separation, recycling and recovery of energy from solid wastes, including disposal of non-recoverable waste residues. Incineration means the controlled combustion of solid waste for disposal. According to the EPA, burning MSW can generate energy while reducing the amount of waste by up to 90 percent in volume and 75% in weight. The two activities are similar and are therefore combined for this discussion.

At this time, the County is not exploring resource recovery and incineration possibilities.

7.5 Landfilling

Section 5.2 and **Appendix 6-A** summarize the disposal capacity of the County landfill in detail. **Appendix 6-B** provides the permit for the landfill and outlines the operations.

Under the major modification #15 to SWP 586, approved by DEQ on December 28, 2016, the landfill permit indicated a remaining life of 28 years or through 2045. The 2023 DEQ annual report

for this landfill indicates a remaining life of 18.7 years (from December 31, 2022) or through approximately 2041. The current planning period runs from 2023 through 2043 so the remaining life in the landfill as reported for calendar year 2022, will not meet the County's needs by the end of the period. Over the next 20 years, the County will be in discussions with Waste Management about possible expansions or alternative disposal options. It should be noted that the life expectancy estimate for any landfill is a function of tonnage, material types, cover materials, and compaction, and can vary throughout the life of the facility. As the facility must report its remaining capacity and estimated life annually, the County can review the data and adjust its planning as needed.

7.6 Litter Control

King George County has adopted anti-litter laws, which are enforced. These laws were adopted to discourage unlawful littering throughout the County. This is discussed in greater detail in **Section 5.4**.

8.0 GOALS AND OBJECTIVES OF PROGRAM

In August, 1993 King George County chose to convert from a publicly-owned and operated landfill operation to a publicly-owned and privately-operated facility. The King George County Landfill and Recycling Facility opened in November 1996. The 348.5-acre facility is located on an approximately 600-acre parcel abutting Route 665, Route 603, Route 605, and the CSX railroad spur in Sealston. The facility's design capacity is 67 million cubic yards of waste. The facility offers collection of white goods, waste oil and antifreeze and sponsors two hazardous waste days to allow residents the opportunity to safely dispose of their waste. Two convenience centers have been developed for MSW and recyclables collection in the County.

The transfer of all previously disposed materials from the former King George landfill to the new facility began in the spring of 1999. The transfer of all waste was completed by the landfill contractor in 2004.

This section outlines the goals and objectives for the County's solid waste management program. The County operates a successful integrated solid waste management system that addresses all aspects of the program, from collections to recycling, reuse and disposal. The County however plans to continue improvements to the program as the County Board of Supervisors expresses interest, as markets open up, and as funding is made available. A majority of the items so noted do not have specific tasks or projects identified at this time but represent on-going activities already incorporated into the program.

Goals for Community Services and Facilities by the County in its Comprehensive Plan[15] include:

- Provide and develop long term, safe and economical disposal of the solid waste generated in King George County.
- Ensure all solid waste is handled efficiently, at low cost, and in an environmentally responsible manner.

Policies identified by the County in its Comprehensive Plan include:

- Develop long term and contingency plans for waste disposal.
- Encourage economically viable recycling of all materials in the solid waste disposal activity.
- Support and encourage roadside cleanup activities.
- Provide recycling facilities at all transfer stations.
- As population increases provide additional solid waste transfer stations.
- Encourage low impact recycling industries in conjunction with the landfill operation.

[15] *King George County Comprehensive Plan, October 1, 2019*
https://www.kinggeorgecountyva.gov/documentcenter/view/4812

- Continue to provide hazardous waste collection days to give residents an opportunity to safely dispose of their waste.

8.1 Collections

The County utilizes the services of Waste Management Inc., to operate collections for the County convenience center system. Operation of the convenience centers has been turned over to the County and plans for expansion of the convenience center system have been halted. **Appendix 5** summarizes the goals and action items for the County's collection program.

8.2 Disposal

The County utilizes the disposal services of Waste Management Inc., under its landfill operations contract. It receives a host fee and other revenues for this operation and does not pay a disposal fee. As reported in the 2023 DEQ Annual Report (for calendar year 2022), the King George Landfill has a remaining life of approximately 18.7 years (through 2041) This falls short of the planning period. Over the next 20 years, the County will explore its options whether it is expansion to the existing landfill or other alternatives. It should be noted that the life expectancy estimate for any landfill is a function of tonnage, material types, cover materials, and compaction, and can vary throughout the life of the facility. As the facility must report its remaining capacity and estimated life annually, the County can review the data and make adjustments to its planning as needed. **Appendix 6** summarizes the goals and action items for the County's disposal program.

8.3 Recycling

The County has a recycling program including household hazardous waste collection days, yard waste mulching operations, all operated and coordinated by Waste Management Inc., under its landfill operations contract. The Operation of the convenience centers has been turned over to the County and plans for expansion of the convenience center system have been halted. **Appendix 7** summarizes the goals and action items for the County's recycling program.

8.4 Litter Control

King George County has adopted anti-litter laws, which are enforced. These laws were adopted to discourage unlawful littering throughout the County. The County promotes recycling and litter control through its public education program. The parks and recreation department assists with this effort.

Item Number	Goal	Action Item	Schedule	Estimated Costs
LC-1	Educate public relative to litter control.	Continue to support existing educational program.	On-going	Possible within County operating budget. Use existing staff
LC-2	Reduce litter in County	Continue to support road cleanups by Adopt-A-Street and Adopt-A-Spot, community volunteers and VDOT. Expand as resources are available.	On-going	Possible within County operating budget. Use existing staff
LC-3	Minimize illegal dumping.	Continue to patrol County. Provide comprehensive collection services.	On-going	Possible within County operating budget. Use existing staff
LC-4	Continue to seek partnerships for litter control programs	pursuing a partnership with surrounding counties to step-up litter prevention programs on a regional basis	On-going	Possible within County operating budget. Use existing staff
LC-6	Continue to beautify the County relative to illegal and roadside litter	Support and encourage roadside cleanup activities	As directed by the County BOS	Possible within County operating budget. Use existing staff
LC-7	Enforcement	Encourage enforcement of anti-litter laws.	On-going	Possible within County operating budget. Use existing staff

9.0 IMPLEMENTATION SCHEDULE

The implementation schedule for the County's integrated waste management program has been summarized under separate sections above, or in appendices attached.

See the following Appendices (which contain summary tables) for implementation schedules under Goals and Objectives of the following programs:

- Collection - **Appendix 5**
- Disposal - **Appendix 6-A**
- Recycling - **Appendix 7**

The goals and objectives including the implementation schedule for the Litter Control program is addressed under Section 8.4.

The County does not anticipate additional costs relative to its program, as expansions of existing systems are already anticipated and covered under the landfill operations contract. Other expenses are already included in the existing operating budget.

10.0 FUNDING AND FINANCING

The Solid Waste Program budget for FY 2024 (FY 2023 – 2024) is anticipated to remain a relatively constant component of the overall County budget. The entire solid waste program budget is compensated by landfill-generated fees provided by the landfill operator under contract to the County. See **Appendix 8** for relevant excerpts of the FY 2024 Annual Budget Report. Refer to the County website[16] for current and past Adopted Annual Budget Reports and Comprehensive Annual Financial Reports.

The County has an appropriate planning mechanism in their budgetary process to allow ample time to project the funding needed and to provide the funding as necessary. Funding for all programs is determined ultimately by the County Board of Supervisors, which must weigh requests from the solid waste program for additional expenditures against the backdrop of the total County budget.

[16] https://www.king-george.va.us/184/Financial-Reports-Documents

11.0 PUBLIC PARTICIPATION

Original Plan – Approved by DEQ on November 12, 2008

King George County advertised a notice for a Public Hearing in *The Journal* on Wednesday, September 15, 2004 and held the public hearing on the plan at the Board of Supervisors meeting held on September 21, 2004. The King George County Board of Supervisors approved the plan at the Board meeting on September 21, 2004 and adopted a resolution stating such. A copy of the public hearing advertisement is included in **Appendix 9-A.** A copy of the County resolution adopting the plan is included in **Appendix 10**. Copies of the plan were placed in the following locations for public review:

- County Public Library
- County Solid Waste Office
- County Board of Supervisors Office

No other specific public participation activities were conducted for the plan. However, the plan will become the cornerstone of future public education activities.

Public participation is not Applicable to this plan update to the existing King George County Solid Waste Management Plan according to *9VAC20-130-130* in the state code. This section will remain for future major amendments.

Major Amendment – Included in 2023/2024 Plan Update

The 2023/2024 update to the SWMP includes a major amendment addressing the increase in landfill capacity for the Permit 586 facility from 45 million cubic yards to 67 million cubic yards as approved by DEQ on December 28, 2016. This permit modification was approved after appropriate public input on the permit application and draft permit.

King George County implemented the public participation for the major amendment in accordance with 9VAC20-130-130 as summarized below. All documentation for this effort is included in **Appendix 12.**

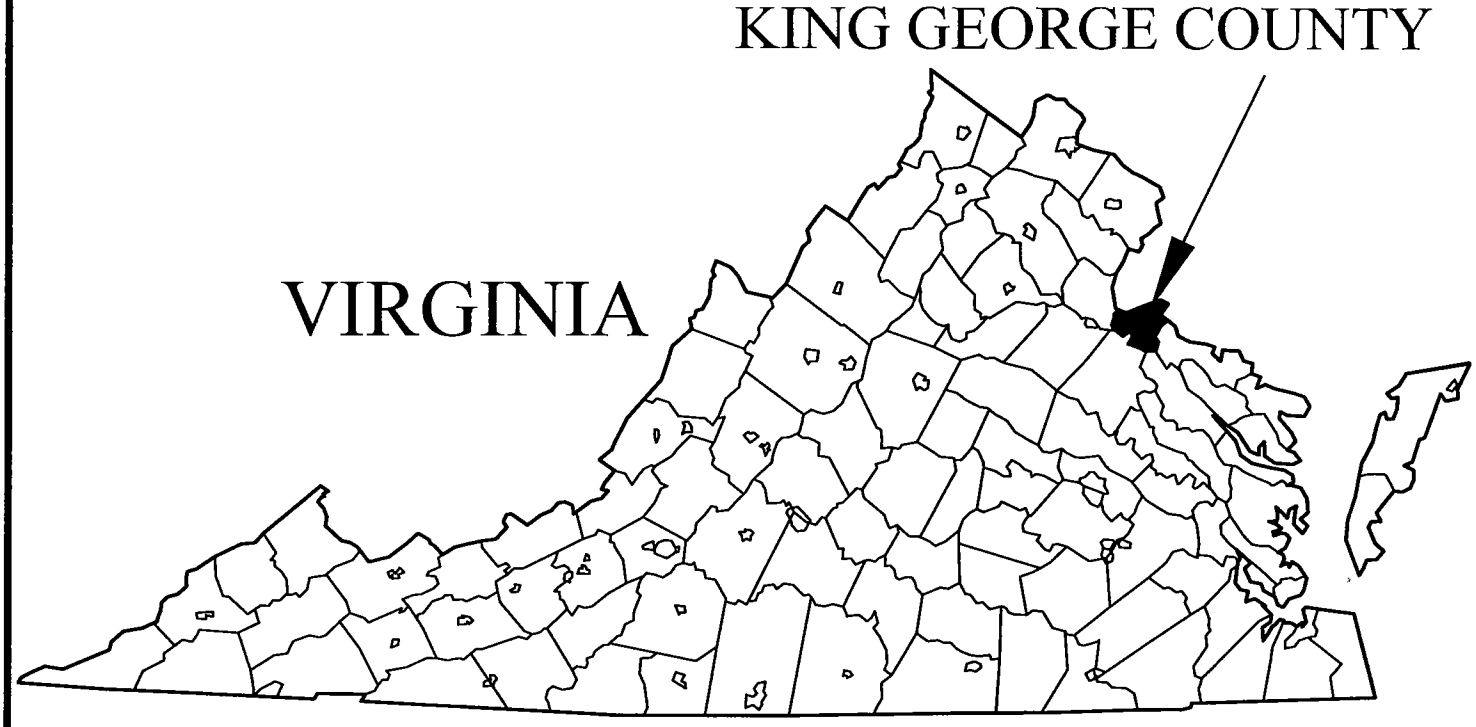
- King George County advertised a notice for a Public Hearing in *The Free Lance-Star* on March 19, 2024 and March 26, 2024. (Advertisements attached.)
- The public hearing on the major amendment to the plan was held at the Board of Supervisors meeting on April 2, 2024. (Meeting agenda and meeting minutes attached.) **(Pending)**
- The King George County Board of Supervisors approved the plan at the Board meeting on April 2, 2024 and adopted a resolution stating such. (Signed resolution attached.) **(Pending)**

- XXXX public comments were received at the meeting. **This will be verified against the final meeting outcome – if comments received will include all comments and responses in Appendix 12.**
- Copies of the plan could be reviewed at kinggeorgecountyva.gov/swmp

No other specific public participation activities were conducted for this major amendment to the Plan. However, the Plan will become the cornerstone of future public education activities.

APPENDIX 1 A

COUNTY LOCATION MAP



Draper Aden Associates
Engineering ◆ Surveying ◆ Environmental Services

Richmond, VA
8090 Villa Park Drive
Richmond, VA 23228
804-264-2228 Fax: 804-264-8773
www.daa.com

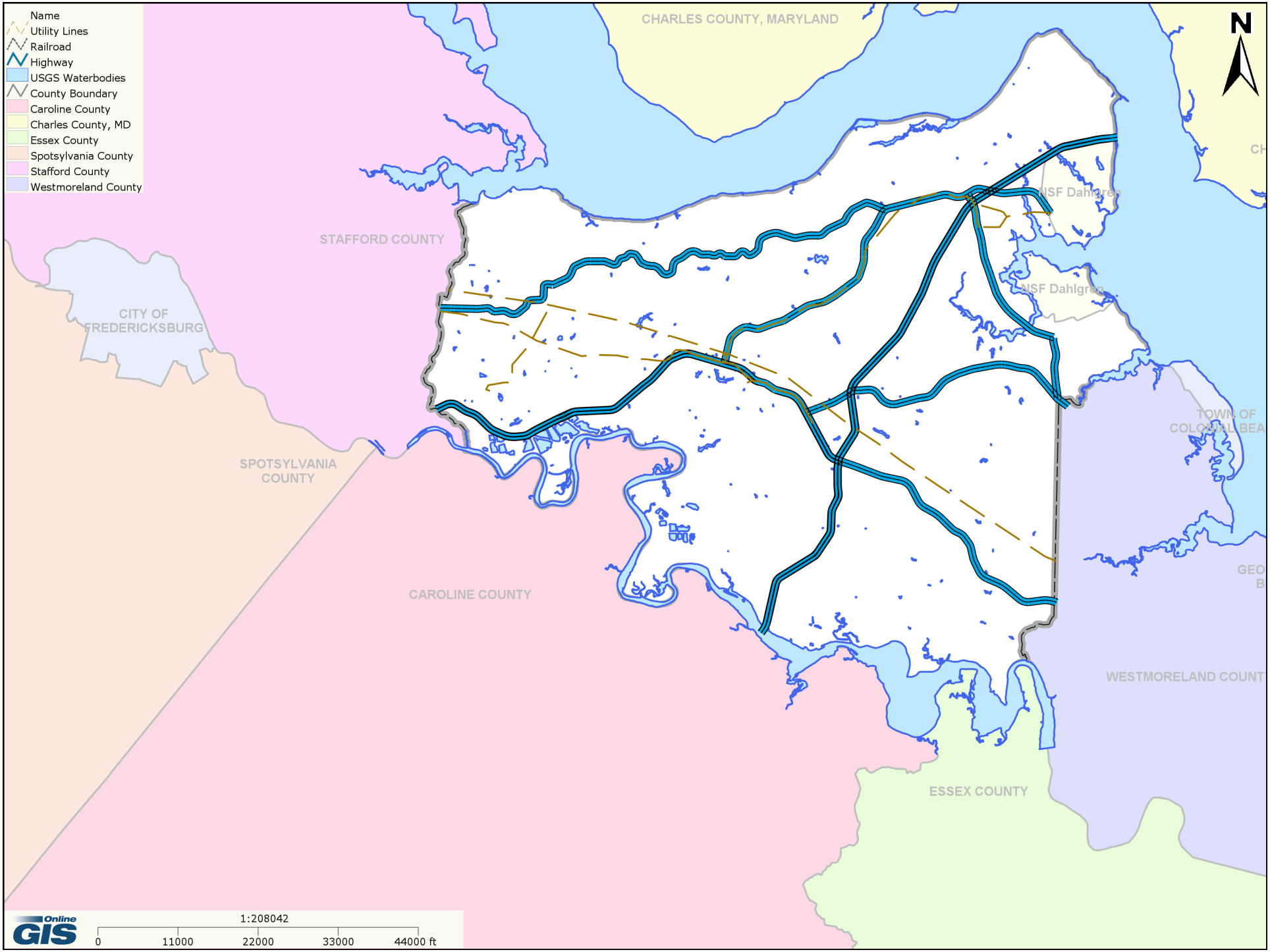
Blacksburg, VA
Charlottesville, VA
Hampton Roads, VA
Raleigh-Durham, NC

FIGURE 1- LOCATION OF KING GEORGE COUNTY

R04443-01

APPENDIX 1 B

MAP OF AREA


Name
Utility Lines
Railroad
Highway
USGS Waterbodies
County Boundary
Caroline County
Charles County, MD
Essex County
Spotsylvania County
Stafford County
Westmoreland County
CHARLES COUNTY, MARYLAND
STAFFORD COUNTY
CITY OF FREDERICKSBURG
SPOTSYLVANIA COUNTY
CAROLINE COUNTY
ESSEX COUNTY
NSF Dahlgren
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TOWN OF COLONIAL BEA
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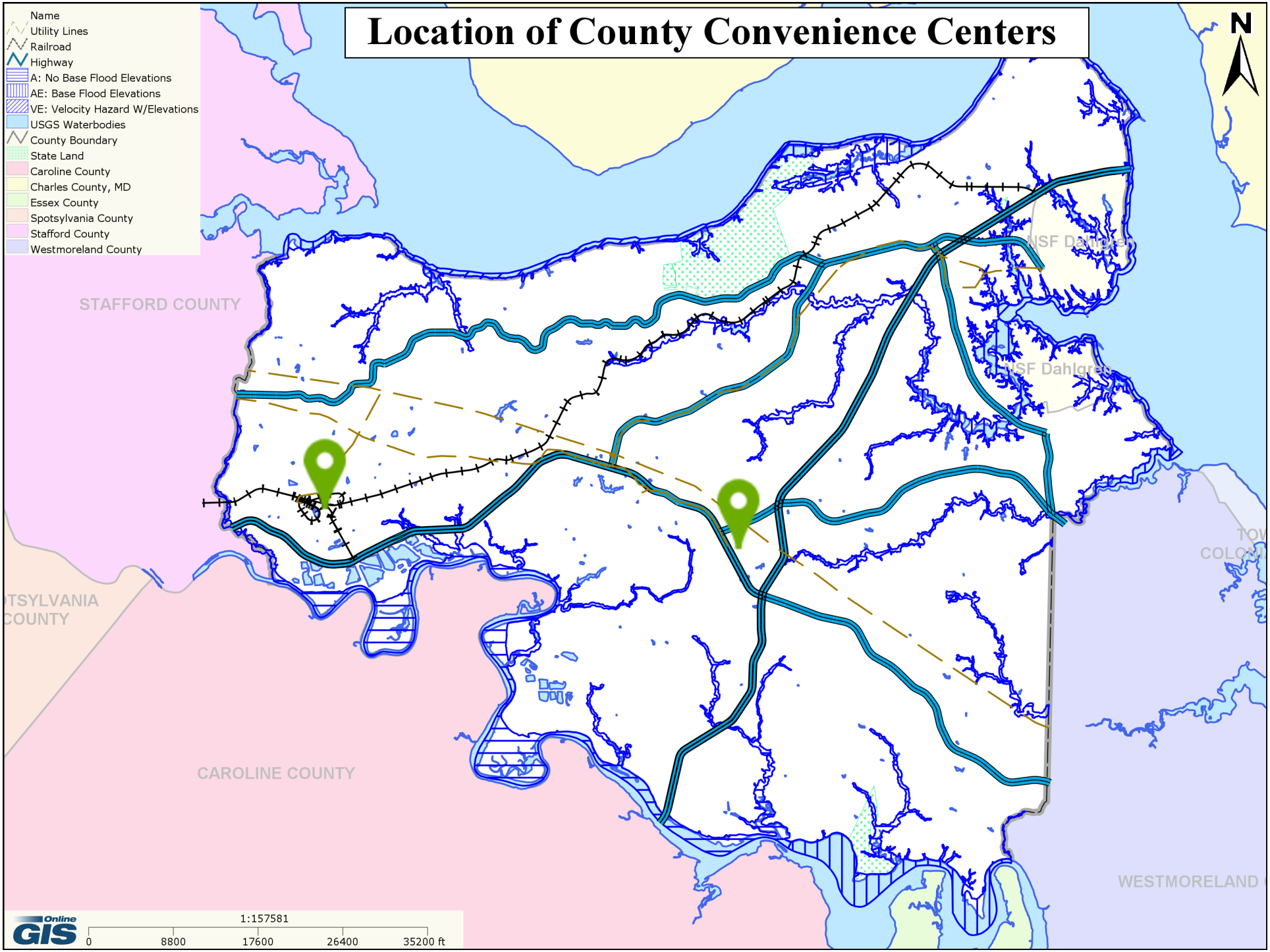
APPENDIX 1 C

LOCATION OF CONVIENIENCE CENTERS


Location of County Convenience Centers
Name
Utility Lines
Railroad
Highway
A: No Base Flood Elevations
AE: Base Flood Elevations
VE: Velocity Hazard W/Elevations
USGS Waterbodies
County Boundary
State Land
Caroline County
Charles County, MD
Essex County
Spotsylvania County
Stafford County
Westmoreland County
N
STAFFORD COUNTY
CAROLINE COUNTY
WESTMORELAND
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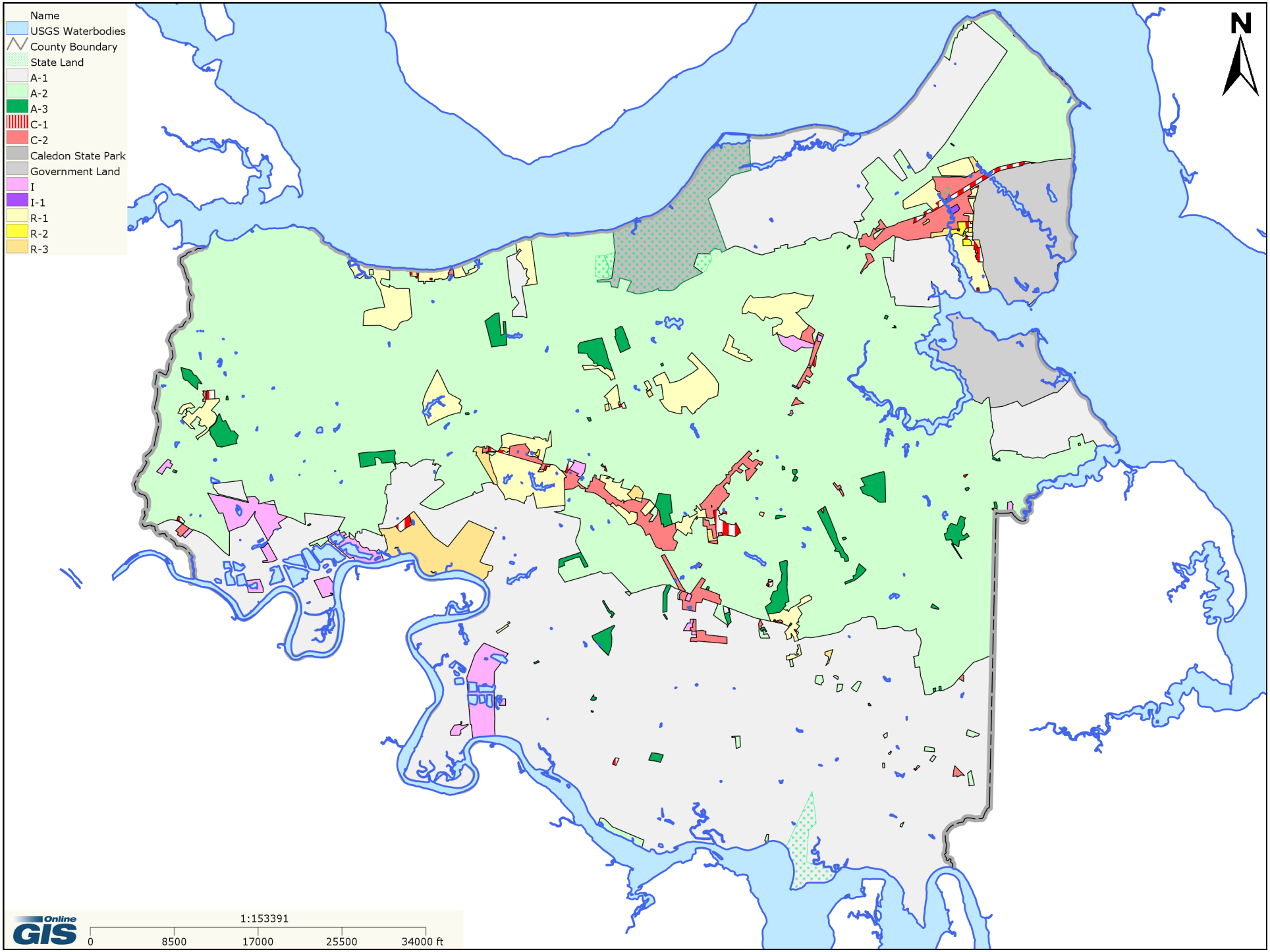
35200 ft

APPENDIX 1 D

COUNTY ZONING


Name
USGS Waterbodies
County Boundary
State Land
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A-2
A-3
C-1
C-2
Caledon State Park
Government Land
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R-1
R-2
R-3
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Online GIS
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17000
25500
34000 ft

APPENDIX 2 A

USEPA FACT SHEET 2017

Advancing Sustainable Materials Management: 2017 Fact Sheet

Assessing Trends in Material Generation, Recycling, Composting, Combustion with Energy Recovery and Landfilling in the United States

November 2019

Introduction

The U.S. Environmental Protection Agency (EPA) has collected and reported data on the generation and disposition of municipal solid waste (MSW) in the United States for more than 30 years. This information is used to measure the success of materials management programs across the country and to characterize the national waste stream. These facts and figures are based on the most recent information, which is from calendar year 2017.

In 2017, in the United States, approximately 268 million tons (U.S. short tons unless specified) of MSW were generated (*See* Figure 1). Of the MSW generated, approximately 67 million tons of MSW were recycled and 27 million tons of MSW were composted. Together, more than 94 million tons of MSW were recycled and composted, equivalent to a 35.2 percent recycling and composting rate (*See* Figure 2). In addition, more than 34 million tons of MSW (12.7 percent) were combusted with energy recovery. Finally, more than 139 million tons of MSW (52.1 percent) were landfilled (*See* Figure 3 and Table 1).

Information about waste generation and disposal is an important foundation for managing materials. Sustainably managing materials requires focusing on the life cycle of a product, from the time it is produced, used, reused and ultimately recycled or discarded. This is known as Sustainable Materials Management (SMM). SMM refers to the use and reuse of materials in the most productive and sustainable way across their entire life cycle. SMM conserves resources, reduces waste and minimizes the adverse environmental impacts of material use.

This report analyzes MSW trends in generation and management, materials and products, and economic indicators affecting MSW. It also includes a section on the generation of construction and demolition (C&D) debris, which is not a part of MSW, but comprises a significant portion of the non-hazardous solid waste stream.

Figure 1. MSW Generation Rates, 1960 to 2017

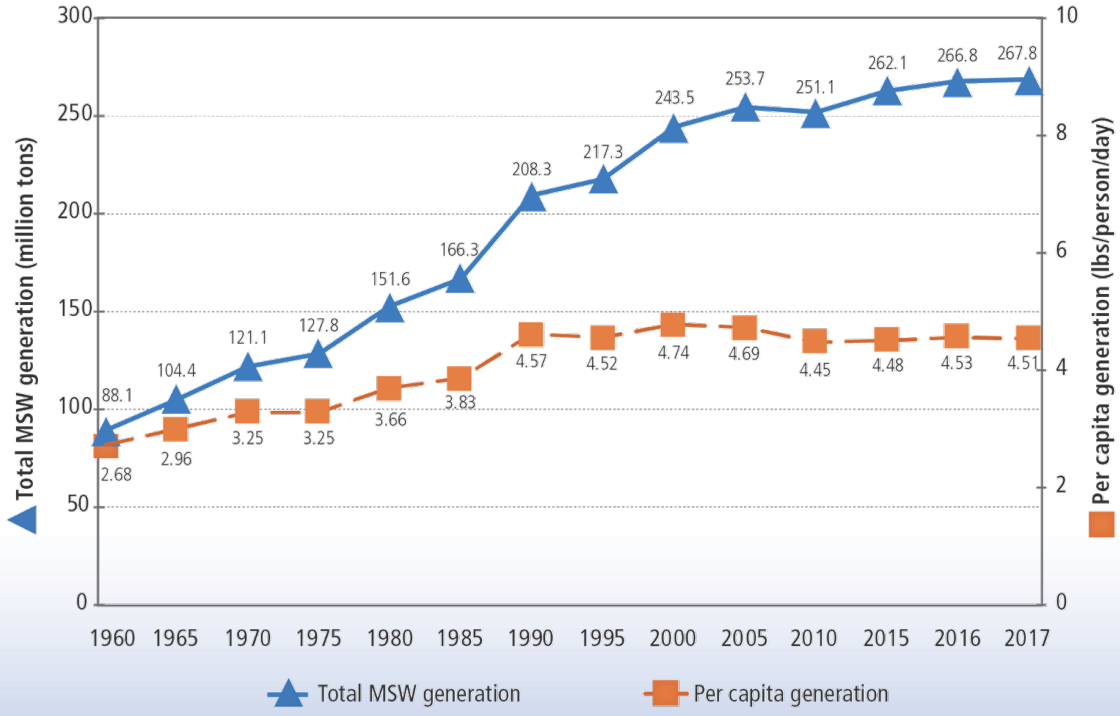


Figure 2. MSW Recycling and Composting Rates, 1960 to 2017

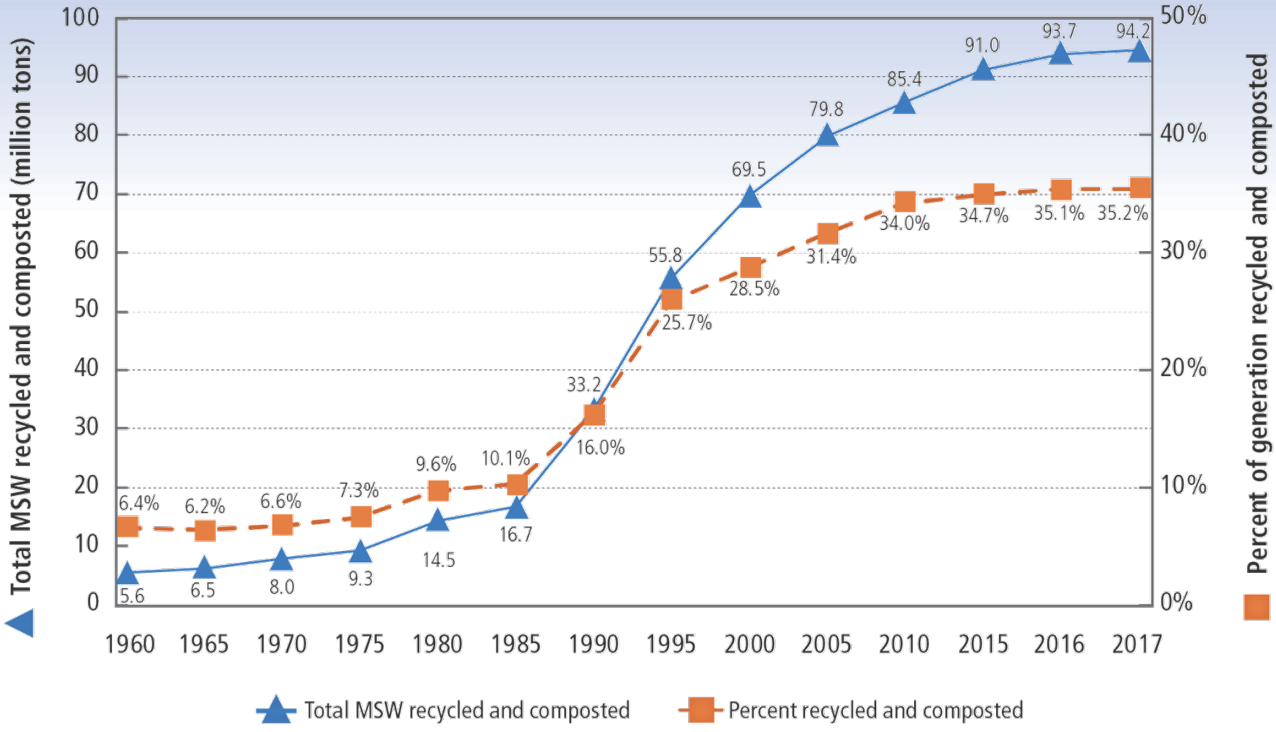


Figure 3. Management of MSW in the United States, 2017

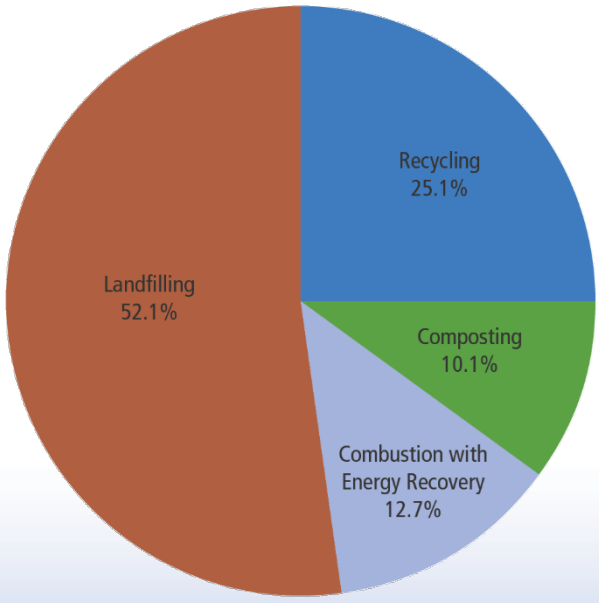


Table 1. Generation, Recycling, Composting, Combustion with Energy Recovery and Landfilling of Materials in MSW, 2017*
(in millions of tons and percent of generation of each material)

Material	Weight Generated	Weight Recycled	Weight Composted	Weight Combusted with Energy Recovery	Weight Landfilled	Recycling as Percent of Generation	Composting as Percent of Generation	Combustion as Percent of Generation	Landfilling as Percent of Generation
Paper and paperboard	67.01	44.17	-	4.49	18.35	65.9%	-	6.70%	27.38%
Glass	11.38	3.03	-	1.48	6.87	26.6%	-	13.01%	60.37%
Metals									
Steel	18.89	6.17	-	2.29	10.43	32.7%	-	12.12%	55.21%
Aluminum	3.83	0.62	-	0.56	2.65	16.2%	-	14.62%	69.19%
Other nonferrous metals†	2.33	1.54	-	0.07	0.72	66.1%	-	3.00%	30.90%
Total metals	**25.05**	**8.33**	-	**2.92**	**13.80**	**33.3%**	-	**11.66%**	**55.09%**
Plastics	35.37	2.96	-	5.59	26.82	8.4%	-	15.80%	75.83%
Rubber and leather	9.11	1.67	-	2.49	4.95	18.3%	-	27.33%	54.34%
Textiles	16.89	2.57	-	3.17	11.15	15.2%	-	18.77%	66.02%
Wood	17.99	3.00	-	2.85	12.14	16.7%	-	15.84%	67.48%
Other materials	5.10	1.45	-	0.67	2.98	28.4%	-	13.14%	58.43%
Total materials in products	**187.90**	**67.18**	-	**23.66**	**97.06**	**35.8%**	-	**12.59%**	**51.66%**
Other wastes									
Food, other‡	40.67	-	2.57	7.47	30.63	-	6.3%	18.37%	75.31%
Yard trimmings	35.18	-	24.42	2.11	8.65	-	69.4%	6.00%	24.59%
Miscellaneous inorganic wastes	4.04	-	-	0.79	3.25	-	-	19.55%	80.45%
Total other wastes	**79.89**	-	**26.99**	**10.37**	**42.53**	-	**33.8%**	**12.98%**	**53.24%**
Total municipal solid waste	**267.79**	**67.18**	**26.99**	**34.03**	**139.59**	**25.1%**	**10.1%**	**12.71%**	**52.13%**

* Includes waste from residential, commercial and institutional sources.

† Includes lead from lead-acid batteries.

‡ Includes collection of other MSW organics for composting.

Details might not add to totals due to rounding.

Negligible = Less than 5,000 tons or 0.05 percent.
A dash in the table means that data are not available.

Trends in Municipal Solid Waste

Our MSW, or trash, is comprised of various items consumers throw away. These items include packaging, food, yard trimmings, furniture, electronics, tires and appliances. MSW does not include industrial, hazardous or C&D waste. Sources of MSW include residential waste, including waste from multi-family housing, as well as waste from commercial and institutional locations, such as businesses, schools and hospitals.

Over the last few decades, the generation, recycling, composting, combustion with energy recovery and landfilling of MSW has changed substantially. Solid waste generation peaked at 4.74 pounds per person per day in 2000. The rate of 4.51 pounds per person per day in 2017 is slightly lower than the 2016 rate, which was 4.53 pounds per person per day (*See* Figure 1).

The combined recycling and composting rate increased from less than 10 percent of generated MSW in 1980 to 35.2 percent in 2017 (*See* Figure 2). Without including composting, recycling alone rose from 14.5 million tons (9.6 percent of MSW) in 1980 to 67.2 million tons (25.1 percent) in 2017. Composting was negligible in 1980, but it rose to 27.0 million tons in 2017 (10.1 percent; *See* Figure 3 and Table 2 for details).

Food

Nationally, the composting of food rose from 2.15 million tons in 2016 (5.3 percent of food generated) to 2.57 million tons in 2017 (6.3 percent).

Combustion with energy recovery was less than 2 percent of generation in 1980 at 2.8 million tons. In 2017, more than 34.0 million tons (12.7 percent of MSW generated) were combusted with energy recovery (*See* Table 2).

Since 1990, the total amount of MSW going to landfills has dropped by 5.7 million tons, from 145.3 million tons in 1990 to 139.6 million tons in 2017 (*See* Table 2). The net per capita 2017 landfilling rate was 2.3 pounds per day, which was lower than the 3.2 per capita rate in 1990 (*See* Table 3).

Table 2. Generation, Recycling, Composting, Combustion with Energy Recovery and Landfilling of MSW, 1960 to 2017 (in millions of tons)

Activity	1960	1970	1980	1990	2000	2005	2010	2015	2016	2017
Generation	88.1	121.1	151.6	208.3	243.5	253.7	251.1	262.1	266.8	267.8
Recycling	5.6	8.0	14.5	29.0	53.0	59.2	65.3	67.6	68.6	67.2
Composting*	neg.	neg.	neg.	4.2	16.5	20.6	20.2	23.4	25.1	27.0
Combustion with energy recovery†	0.0	0.5	2.8	29.8	33.7	31.7	29.3	33.5	33.9	34.0
Landfilling and other disposal‡	82.5	112.6	134.3	145.3	140.3	142.2	136.3	137.6	139.2	139.6

* Composting of yard trimmings, food and other MSW organic material. Does not include backyard composting.

† Includes combustion of MSW in mass burn or refuse-derived fuel form, and combustion with energy recovery of source separated materials in MSW (e.g., wood pallets, tire-derived fuel).

‡ Landfilling after recycling, composting and combustion with energy recovery. Includes combustion without energy recovery.

Details might not add to totals due to rounding.

neg. (negligible) = less than 5,000 tons.

Table 3. Generation, Recycling, Composting, Combustion with Energy Recovery and Landfilling of MSW, 1960 to 2017 (in pounds per person per day)

Activity	1960	1970	1980	1990	2000	2005	2010	2015	2016	2017
Generation	2.7	3.3	3.7	4.6	4.7	4.7	4.4	4.5	4.5	4.5
Recycling	0.2	0.2	0.4	0.6	1.0	1.1	1.1	1.2	1.2	1.1
Composting*	neg.	neg.	neg.	0.1	0.3	0.4	0.4	0.4	0.4	0.5
Combustion with energy recovery†	0.0	neg.	0.1	0.7	0.7	0.6	0.5	0.6	0.6	0.6
Landfilling and other disposal‡	2.5	3.1	3.2	3.2	2.7	2.6	2.4	2.3	2.3	2.3
Population (In millions)	180.0	204.0	227.3	249.9	281.4	296.4	309.1	320.9	323.1	325.1

* Composting of yard trimmings, food, and other MSW organic material. Does not include backyard composting.

† Includes combustion of MSW in mass burn or refuse-derived fuel form, and combustion with energy recovery of source separated materials in MSW (e.g., wood pallets, tire-derived fuel).

‡ Landfilling after recycling, composting, and combustion with energy recovery. Includes combustion without energy recovery.

Details might not add to totals due to rounding.

neg. (negligible) = less than 5,000 tons.

Analyzing MSW

EPA analyzes MSW by breaking down the data in two ways: by material or by product. Materials are made into products, which are ultimately reprocessed through recycling or composting, or managed by combustion with energy recovery facilities or landfills. Examples of materials that EPA tracks include paper and paperboard, plastics, metals, glass, rubber, leather, textiles, wood, food and yard trimmings. For a full list of materials, *see* Table 1.

Products are what people buy and handle, and they are manufactured out of the types of materials listed above. Product categories include containers and packaging, nondurable goods, durable goods, food and yard trimmings. Containers and packaging, such as milk cartons and plastic wrap, are assumed to be in use for a year or less; nondurable goods like newspaper and clothing are assumed to be in use for less than three years; and durable goods, such as furniture, are assumed to be in use for three or more years. Some products, such as appliances, may be made of more than one material. Information about products shows how consumers are using and discarding materials and offers strategies on ways to maximize the source reduction, recycling and composting of materials.

Materials in MSW

Table 1 and the following figures provide specific information about materials in MSW. Table 1 shows generation, recycling, composting, combustion with energy recovery and landfilling by material, weight and percent of generation.

Figure 4 below provides the breakdown of MSW generation by material. Paper and paperboard, along with food, continued to be the largest components of MSW generated. Paper and paperboard accounted for 25 percent, while food accounted for about 15 percent. Yard trimmings and plastics comprised about 13 percent each. The remaining amount of MSW generated consisted of rubber, leather and textiles; metals; wood; glass; and other materials.

Composting Collection Programs [1,2]

- About 3,860 community composting programs were documented in 2017—an increase from 3,227 in 2002.
- Food composting curbside collection programs served 6.1 million households in 2017. About 6.7 million households had access to drop-off food collection programs that year.

Figure 5 provides the breakdown of MSW recycling by material in 2017. Paper and paperboard composed the largest component of MSW recycling, representing nearly 66 percent. Metals made up over 12 percent of MSW recycled. The remaining amount of MSW recycled consisted of rubber, leather and textiles; plastics; glass; wood; and other materials.

Figure 6 provides the breakdown of MSW composting by material, Figure 7 provides the breakdown of MSW combustion with energy recovery, and Figure 8 provides the breakdown of MSW landfilling.

Figure 4. Total MSW Generation (by material), 2017
267.8 Million Tons

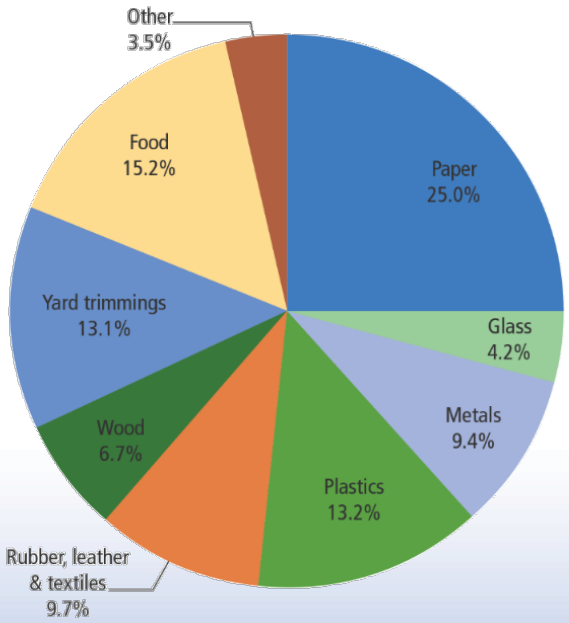


Figure 5. Total MSW Recycling (by material), 2017
67.2 Million Tons

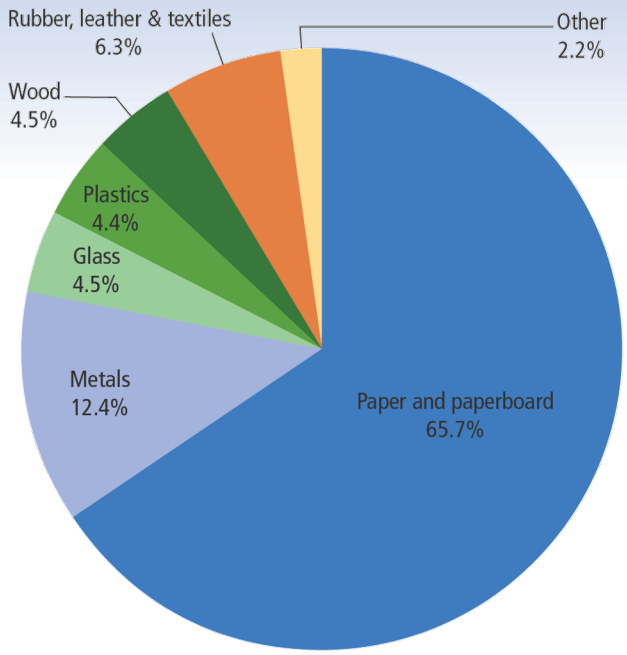


Figure 6. Total MSW Composting (by material), 2017
27.0 Million Tons

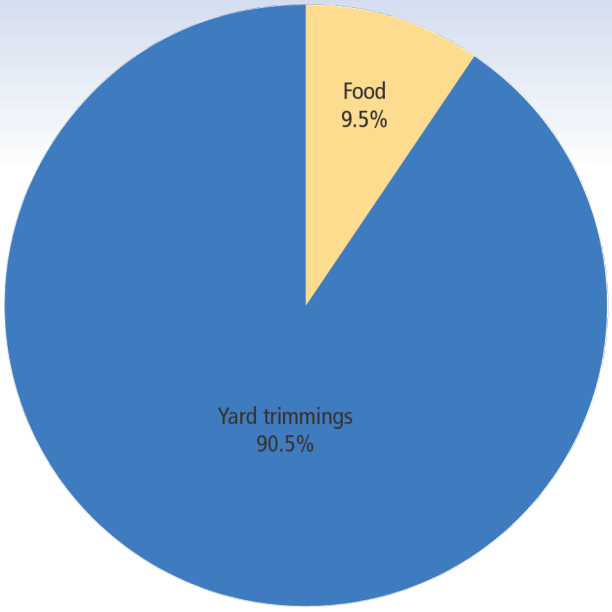


Figure 7. Total MSW Combusted with Energy Recovery (by material), 2017 34.0 Million Tons

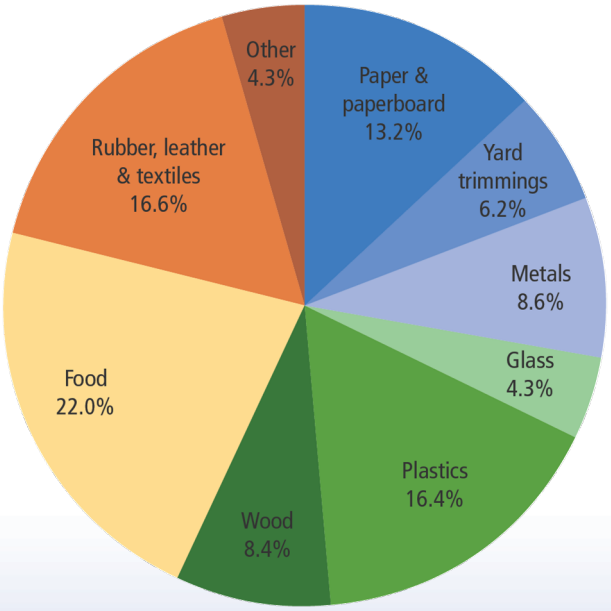
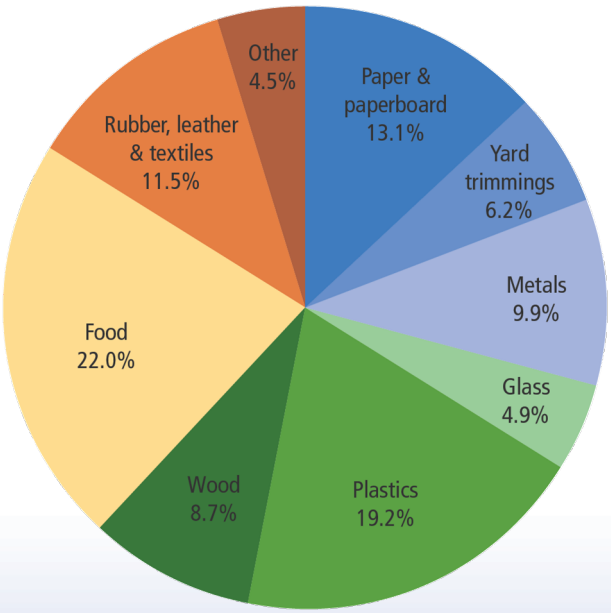


Figure 8. Total MSW Landfilled (by material), 2017
139.6 Million Tons



Products in MSW

The following information provides the details of the products found in MSW. Table 4 shows generation, recycling, composting, combustion with energy recovery and landfilling by product category, weight and percent of generation. The product categories include containers and packaging, durable goods, nondurable goods, and food and yard trimmings.

Containers and packaging made up the largest portion of MSW generated at 80 million tons (29.9 percent) in 2017. More than 57 million tons (21.4 percent of MSW generation) of durable goods were generated, while more than 50 million tons (18.9 percent of MSW generation) of nondurable goods were generated. The generation of food in MSW was over 40 million tons (15.2 percent), yard trimmings generation was 35 million tons (13.1 percent), and the generation of other wastes was about four million tons (1.5 percent).

The Containers and packaging product category had the highest recycling rate at 50.1 percent in 2017. Paper products, steel and glass were the most recycled materials by percentage in this category. The recycling of nondurable goods was 32.1 percent. Paper products such as newspapers/mechanical papers were the most recycled nondurable goods. Newspapers/mechanical papers include newspapers, directories, inserts, as well as some advertisement and direct mail printing. Overall, 18.9 percent of durable goods were recycled. With a 99.1 percent recycling rate in 2017, lead-acid batteries continued to be one of the most recycled products.

Yard trimmings had the highest composting rate of all product categories at 69.4 percent. Food was composted at a rate of 6.3 percent.

Food was the product category with the highest rate of combustion with energy recovery with a rate of 18.4 percent. Durable goods were combusted at a rate of 15.9 percent and nondurables at a rate of 13.3 percent. Containers and packaging, along with yard trimmings, were combusted at rates below 10 percent.

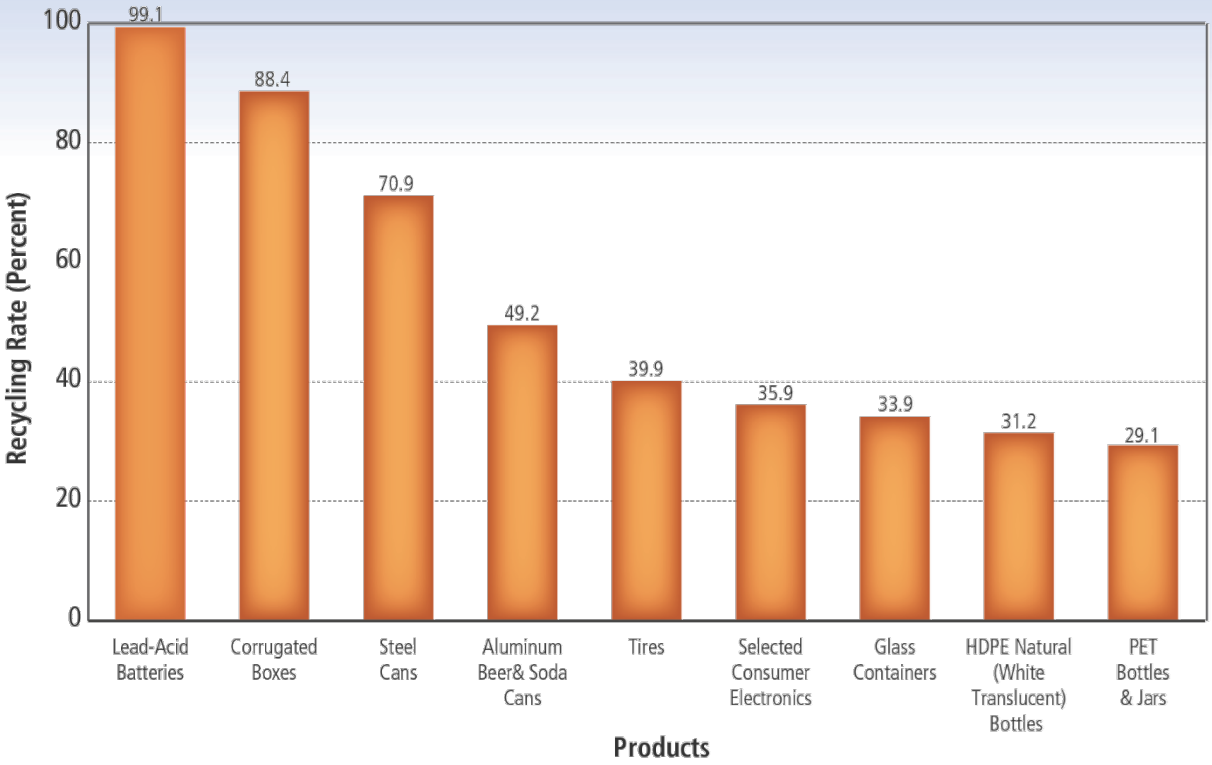
Food was the product category with the highest landfill rate at 75.3 percent. Durable goods followed with a landfill rate of 65.2 percent. Nondurable goods had the third highest landfill rate at 54.6 percent. Containers and packaging, along with yard trimmings, were the product categories with the lowest landfill rates at 40.1 percent and 24.6 percent, respectively.

Figure 9 displays selected individual products with high recycling rates.

Recycling Rates

Measured by percent of generation, individual products with the highest recycling rates in 2017 were lead-acid batteries (99.1 percent), corrugated boxes (88.4 percent), steel cans (70.9 percent), newspapers/mechanical papers (76.8 percent), major appliances (60.3 percent), aluminum cans (49.2 percent), mixed paper (48.3 percent), tires (39.9 percent) and selected consumer electronics (35.9 percent).

Figure 9. Selected Products with High Recycling Rates, 2017*



*Does not include combustion with energy recovery

Table 4. Generation, Recycling, Composting, Combustion with Energy Recovery and Landfilling of Products in MSW, 2017*
(in millions of tons and percent of generation of each product)

Products	Weight Generated	Weight Recycled	Weight Composted	Weight Combusted with Energy Recovery	Weight Landfilled	Recycling as Percent of Generation	Composting as Percent of Generation	Combustion as Percent of Generation	Landfilling as Percent of Generation
Durable goods									
Steel	16.88	4.70	-	2.19	9.99	27.8%	-	13.0%	59.2%
Aluminum	1.72	-	-	0.26	1.46	-	-	15.1%	84.9%
Other nonferrous metals†	2.33	1.54	-	0.07	0.72	66.1%	-	3.0%	30.9%
Glass	2.45	Negligible	-	0.32	2.13	Negligible	-	13.1%	86.9%
Plastics	13.46	0.85	-	1.72	10.89	6.3%	-	12.8%	80.9%
Rubber and leather	7.94	1.67	-	2.27	4.00	21.0%	-	28.6%	50.4%
Wood	6.59	Negligible	-	1.20	5.39	Negligible	-	18.2%	81.8%
Textiles	3.91	0.59	-	1.02	2.30	15.1%	-	26.1%	58.8%
Other materials	1.84	1.45	-	0.03	0.36	78.8%	-	1.6%	19.6%
Total durable goods	**57.12**	**10.80**	**-**	**9.08**	**37.24**	**18.9%**	**-**	**15.9%**	**65.2%**
Nondurable goods									
Paper and paperboard	25.95	14.09	-	2.33	9.53	54.3%	-	9.0%	36.7%
Plastics	7.42	0.22	-	1.40	5.80	3.0%	-	18.9%	78.2%
Rubber and leather	1.17	Negligible	-	0.22	0.95	Negligible	-	18.8%	81.2%
Textiles	12.68	1.98	-	2.09	8.61	15.6%	-	16.5%	67.9%
Other materials	3.48	Negligible	-	0.68	2.80	Negligible	-	19.5%	80.5%
Total nondurable goods	**50.70**	**16.29**	**-**	**6.72**	**27.69**	**32.1%**	**-**	**13.3%**	**54.6%**

Table 4 (continued). Generation, Recycling, Composting, Combustion with Energy Recovery and Landfilling of Products in MSW, 2017*
(in millions of tons and percent of generation of each product)

Products	Weight Generated	Weight Recycled	Weight Composted	Weight Combusted with Energy Recovery	Weight Landfilled	Recycling as Percent of Generation	Composting as Percent of Generation	Combustion as Percent of Generation	Landfilling as Percent of Generation
Containers and packaging									
Steel	2.01	1.47	-	0.10	0.44	73.1%	-	5.0%	21.9%
Aluminum	1.89	0.62	-	0.26	1.01	32.8%	-	13.8%	53.4%
Glass	8.93	3.03	-	1.16	4.74	33.9%	-	13.0%	53.1%
Paper and paperboard	41.06	30.08	-	2.16	8.82	73.3%	-	5.3%	21.5%
Plastics	14.49	1.89	-	2.47	10.13	13.0%	-	17.0%	69.9%
Wood	11.40	3.00	-	1.65	6.75	26.3%	-	14.5%	59.2%
Other materials	0.30	Negligible	-	0.06	0.24	Negligible	-	20.0%	80.0%
Total containers and packaging	**80.08**	**40.09**	**-**	**7.86**	**32.13**	**50.1%**	**-**	**9.8%**	**40.1%**
Other wastes									
Food, other‡	40.67	-	2.57	7.47	30.63	-	6.3%	18.4%	75.3%
Yard trimmings	35.18	-	24.42	2.11	8.65	-	69.4%	6.0%	24.6%
Miscellaneous inorganic wastes	4.04	-	-	0.79	3.25	-	-	19.6%	80.4%
Total other wastes	**79.89**	**-**	**26.99**	**10.37**	**42.53**	**-**	**33.8%**	**13.0%**	**53.2%**
Total municipal solid waste	**267.79**	**67.18**	**26.99**	**34.03**	**139.59**	**25.1%**	**10.1%**	**12.7%**	**52.1%**

* Includes waste from residential, commercial and institutional sources.

† Includes lead from lead-acid batteries.

‡ Includes collection of other MSW organics for composting.

Details might not add to totals due to rounding.

Negligible = less than 5,000 tons or 0.05 percent.
A dash in the table means that data are not available.

Environmental and Economic Benefits

Environmental Benefits of Recycling and Composting

The energy and greenhouse gas (GHG) benefits of recycling, composting and combustion with energy recovery that are shown in Table 5 are calculated using EPA's WARM (Waste Reduction Model) tool (*See*: https://www.epa.gov/warm). WARM calculates and totals the GHG emissions of baseline and alternative waste management practices, including source reduction, recycling, composting, combustion with energy recovery and landfilling. For example, paper and paperboard recycling, at about 44.2 million tons, resulted in a reduction of about 148 $MMTCO_2E$ in 2017. This reduction is equivalent to removing over 31 million cars from the road for one year.

> In 2017, more than 94 million tons of MSW in the U.S. were recycled and composted, saving over 184 $MMTCO_2E$. This is comparable to the emissions that could be reduced from taking over 39 million cars off the road in a year.

Table 5. 2017 Environmental Benefits

(The numbers in the Recycled, Composted, Combustion with Energy Recovery and Landfilled columns are listed by weight of material* in millions of tons)

Material	Recycled	Composted	Combustion with Energy Recovery	Landfilled	GHG Benefits ($MMTCO_2E$)	Number of Cars Taken Off the Road Per Year (millions of cars)
Paper and paperboard	44.17	-	4.49	18.35	(147.97)	(31.42)
Glass	3.03	-	1.48	6.87	(0.89)	(0.19)
Metals						
Steel	6.17	-	2.29	10.43	(15.12)	(3.21)
Aluminum	0.62	-	0.56	2.65	(5.66)	(1.20)
Other nonferrous metals**	1.54	-	0.07	0.72	(6.87)	(1.46)
Total metals	**8.33**	**-**	**2.92**	**13.8**	**(27.65)**	**(5.87)**
Plastics	2.96	-	5.59	26.82	3.82	0.81
Rubber and leather†	1.67	-	1.74	0.78	0.17	0.04
Textiles	2.57	-	3.17	11.15	(2.76)	(0.59)
Wood	3.00	-	2.85	12.14	(3.15)	(0.67)
Food, other‡	-	2.57	7.47	30.63	(6.90)	(1.46)
Yard trimmings	-	24.42	2.11	8.65	0.85	0.18
Miscellaneous inorganic wastes	-	-	0.79	3.25	(0.27)	(0.58)
Totals	**65.73**	**26.99**	**32.61**	**132.44**	**(184.74)**	**(39.22)**

*Includes material from residential, commercial and institutional sources.

**Includes lead-acid batteries. Other nonferrous metals calculated in WARM as mixed metals.

†Only includes rubber from tires.

‡Includes collection of other MSW organics for composting.

These calculations do not include an additional 10.02 million tons of MSW that could not be addressed in the WARM model. $MMTCO_2E$ is million metric tons of carbon dioxide equivalent. Numbers in parentheses indicate a reduction in either greenhouse gases or vehicles, and therefore represent environmental benefits.

Source: WARM model Version 15 (https://www.epa.gov/warm)

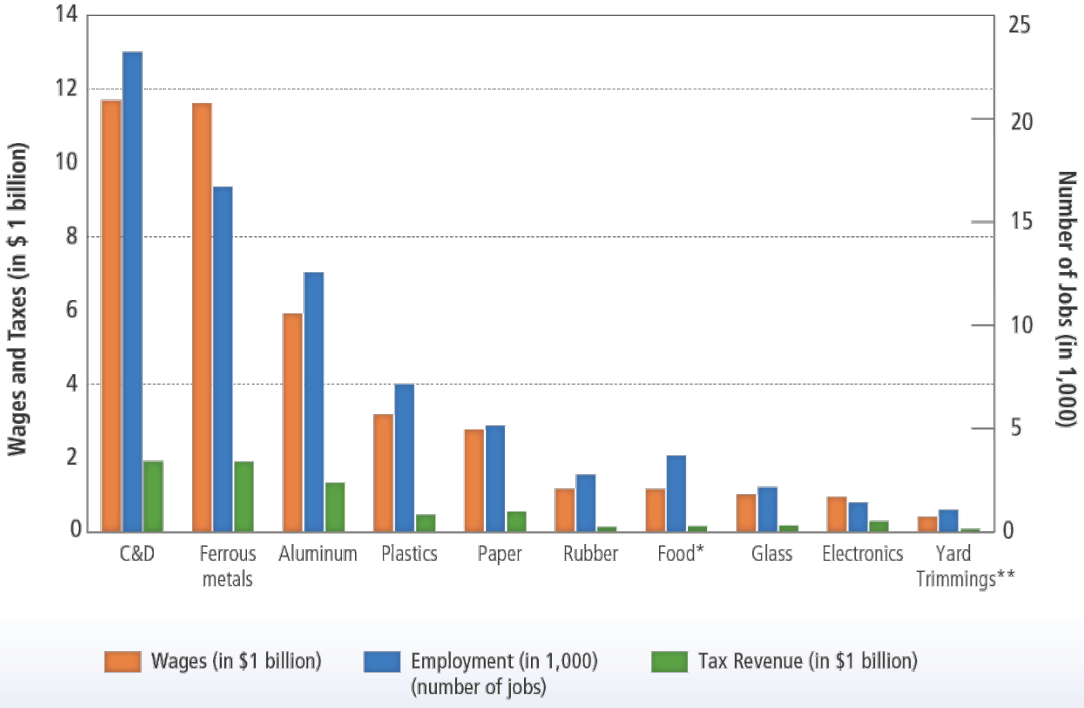
Economic Indicators

Economic Benefits of Recycling and Composting

How our nation uses materials is fundamental to our economic and environmental future. Global competition for finite resources is expected to continue to increase. A more productive and less impactful use of materials helps our society remain economically competitive, contributes to our prosperity and protects the environment. By using waste materials as valuable raw materials, recycling creates jobs, builds more competitive manufacturing industries and significantly contributes to the U.S. economy.

EPA's 2001 Recycling Economic Information (REI) Study evaluated the number of recycling jobs, wages and tax revenue. The Agency updated the study with a 2016 REI Report[3] to increase the understanding of the economic implications of material reuse and recycling. The 2016 REI Report included updated information about the number of recycling jobs, wages and tax revenue (*See* Figure 10). The report showed that the recycling and reuse of materials creates jobs and also generates local and state tax revenues. The data from the most recent year available showed that in 2007, recycling and reuse activities in the United States accounted for: 757,000 jobs; $36.6 billion in wages; and $6.7 billion in tax revenues. This calculation equates to 1.57 jobs for every 1,000 tons of materials recycled. Construction and demolition debris provided the largest contribution to all three categories (jobs, wages and tax revenue), followed by ferrous metals and nonferrous metals, such as aluminum.

Figure 10. Wages, Taxes and Jobs Attributed to Recycling



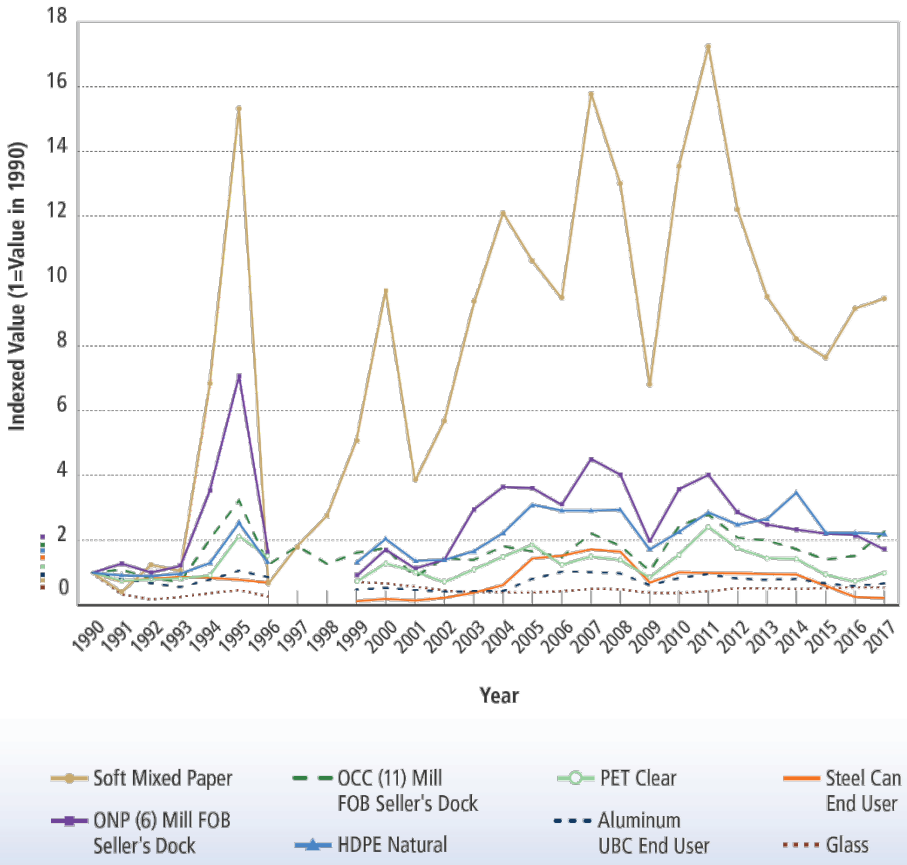
*Food category includes animal feed, meal, meat, fat, oils and tallow, as well as community food service
**Yard Trimmings category includes biodiesel, biogas, compost, mulch and wood chips

Recycled Commodity Values

Figure 11 shows the indexed values by year for the following recycled commodities from 1990 to 2017: high-density polyethylene (HDPE) natural bottles; polyethylene terephthalate (PET) clear bottles; aluminum used beverage cans (UBC); steel cans; old newspaper (ONP) (grade 6); old corrugated containers (OCC) (grade 11); paper stock (PS) (grade 1) soft mixed paper; and glass containers .The values are normalized to 2017 using the Consumer Price Index (CPI) from the Bureau of Labor Statistics (BLS).They are indexed to allow commodity values with different metrics, such as dollars per ton, dollars per gross ton and dollars per short ton, to be shown on the same graph and to compare their relative rates of change. The indexed value indicates the change in value of the data since 1990, where one is equal to the value in 1990. For example, if for a given year, the indexed value were two, then the commodity value for that year would be two times the 1990 value.

Figure 11 shows similar trends across all commodities for indexed values. For example, values for plastics and papers spiked in 1995, and values for most commodities dipped in 2009, relative to 1990. Additionally, many commodities, such as plastics and papers, also experienced a price spike in 2000, 2007 and 2011, followed by a dip in 2015. In contrast, the indexed lines for glass, aluminum and steel cans appear to fluctuate less frequently.

Figure 11. Indexed Recycled Commodity Values by Year



Source: Pulp & Paper Global Fact & Price Book, 2003-2004. Page 128. Paperloop, Inc. 2004. See endnotes for additional sources[4]

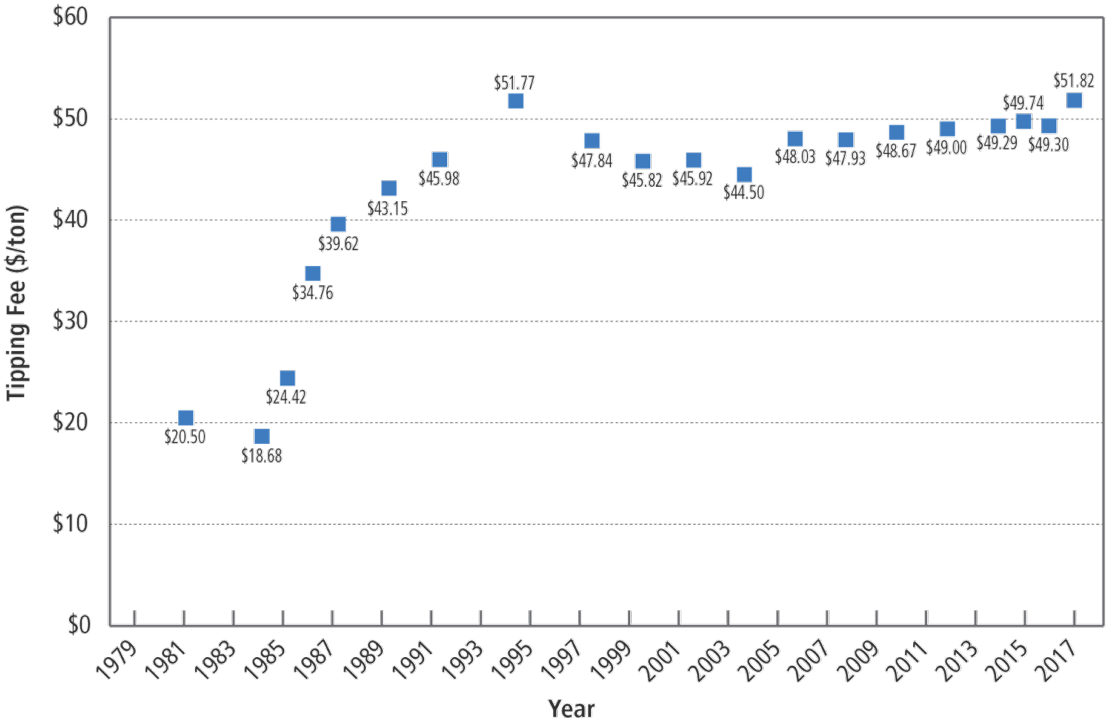
Landfill Tipping Fees

From 1985 to 1995, there was a rapid rise in national landfill tipping fees, followed by a steady decrease from 1995 to 2004. Since 2004, there has been a slow and steady average increase of about one percent per year in landfill tipping fees (*See* Figure 12). The tipping fees are expressed in constant 2017 dollars.

Tipping fees are important to consider as they typically increase as landfill capacity decreases. The difference in tipping fees regionally is correlated to landfill capacity, as the average tipping fee in Western states ($35.69) with more available space for landfills (e.g., Texas, Colorado, Idaho, Montana, Nevada) is less than half of the average in the Northeast ($74.75).[5]

National mean annual landfill tipping fees were normalized to the value of the dollar in 2017 using the Consumer Price Index (CPI) from the Bureau of Labor Statistics to allow meaningful comparisons. This figure shows an average increase from 1985 to 1995 of $3.31 per year, followed by a steady decrease of $0.81 per year through 2004 and an average increase of $0.56 per year from 2004 to 2017.

Figure 12. National Landfill Tipping Fees, 1982-2017 ($2017 per ton)



Source: National Solid Wastes Management Association (NSWMA) Municipal Solid Waste Landfill Facts. October 2011 (Data from 1985 to 2008). Waste Business Journal. "The Cost to Landfill MSW Continues to Rise Despite Soft Demand." July 11, 2017 (Data for 2010 to 2015). "Analysis of MSW Landfill Tipping Fees" April 2018 (Data for 2016 and 2017). https://erefdn.org/product/analysis-msw-landfill-tipping-fees-2/

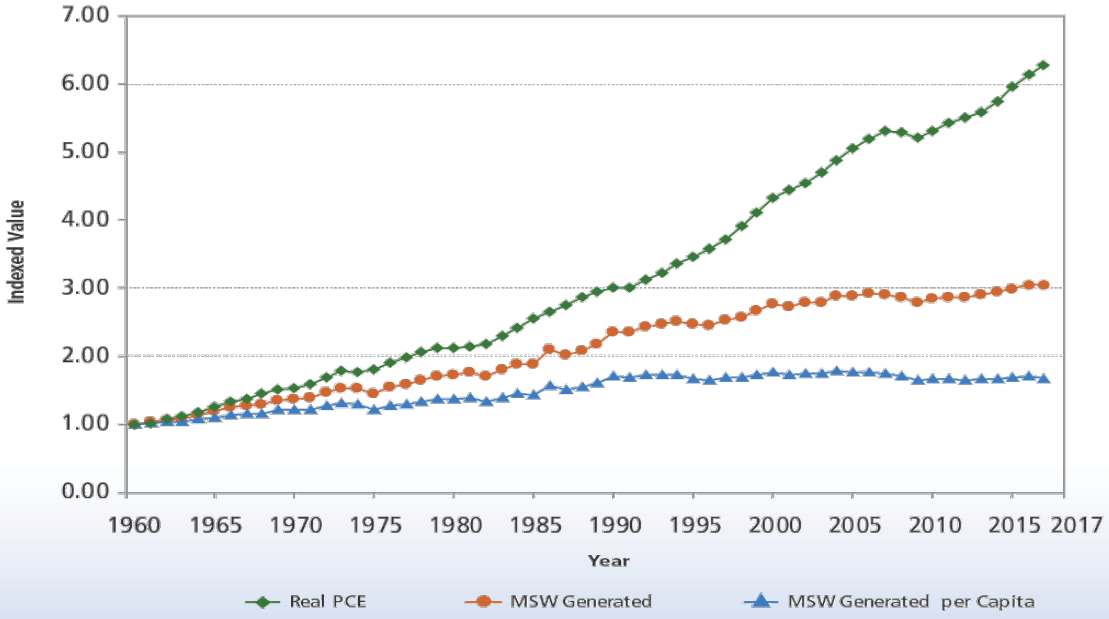
MSW Generation and Household Spending

In the United States, the change in the amount of MSW generated typically mirrors trends in how much money households spent on goods and services. Personal Consumer Expenditures (PCE) measure household spending on goods and services such as food, clothing, vehicles and recreation services. PCE is one of the four components of economic growth, along with government spending, private investments and net exports. As PCE is an indicator of the household consumption of goods and services, which make up nearly 70 percent of the gross domestic product (GDP), PCE has a stronger conceptual tie to MSW generation than the other three GDP components. PCE adjusted for inflation is referred to as real PCE. This metric is more useful in making comparisons over time because it normalizes the value of a dollar by considering how much a dollar could purchase in the past versus today. Figure 13 explores the relationship between MSW generated and real PCE.

Figure 13 is an indexed graph, showing the relative changes in real PCE, MSW generated and MSW generated per capita over time. It is indexed to allow all three of these metrics to be shown on the same graph and to compare their relative rates of change since 1960. The indexed value indicates the change in the value of the data since 1960. For example, if, for a given year, the value was three, then the data value for that year would be three times the 1960 value. In this case, if the 1960 value were 200, then the resulting year's value would be 600. The 2017 MSW per capita generation indexed value is 1.7, which means that MSW per capita generation has increased by 70 percent since 1960.

Figure 13 shows that real PCE has increased at a faster rate than MSW generation, and the disparity has become even more distinct since the mid-1990s. This index indicates that the amount of MSW generated per dollar spent is falling. In other words, the U.S. economy has been able to enjoy dramatic increases in household spending on consumer goods and services without the societal impact of similarly increasing MSW generation rates. This figure also shows that the MSW generated per capita leveled off in the early-to-mid 2000s.

Figure 13. Indexed MSW Generated and Real PCE over Time (1960-2017)



Source: See endnotes[6]

MSW Methodology

The data summarized in this fact sheet characterizes the MSW stream as a whole by using a materials flow methodology that relies on a mass balance approach. EPA recognizes that there are several approaches to measuring material flows, such as by volume. To be consistent, EPA reports the quantities of materials in tons in the current fact sheet, but the Agency will continue to explore options for alternative measurement methodologies to describe materials management in the United States.

EPA has consistently used materials flow analysis to allow for the comparison of data over the last three decades. EPA recognizes that this methodology differs from other methodologies that also estimate the generation of MSW and other waste data. EPA will continue to work with stakeholders to identify methodologies and additional publicly available data to improve our national understanding of materials flow in the United States.

Using data gathered from industry associations, businesses and government sources, such as the U.S. Department of Commerce and the U.S. Census Bureau, EPA estimates the weight in tons of all MSW materials and products generated, recycled, composted, combusted with energy recovery and landfilled. Other sources of data, such as waste characterizations and research reports performed by governments, industry or the press, supplement these data.

Construction and Demolition (C&D) Debris Generation Results

Construction and demolition (C&D) debris is a type of waste that is not included in MSW. Materials included in C&D debris are steel, wood products, drywall and plaster, brick and clay tile, asphalt shingles, concrete and asphalt concrete. These materials are used in buildings, roads and bridges, and other structures. The generation estimate represents C&D debris amounts from construction, renovation and demolition activities for buildings, roads and bridges, and other structures.

In 2017, 569 million tons of C&D debris were generated. Figure 14 shows the 2017 generation composition for C&D debris. C&D concrete was the largest portion at 69.7 percent, followed by asphalt concrete at 15.0 percent. C&D wood products made up 7.1 percent, and the other products accounted for 8.1 percent combined. The 2017 generation estimates are presented in more detail in Table 6. As shown in Figure 15, demolition represented over 90 percent of total C&D debris generation. Construction, on the other hand, represented under 10 percent.

Figure 14. C&D Generation Composition by Material (before processing), 2017
569 Million Tons

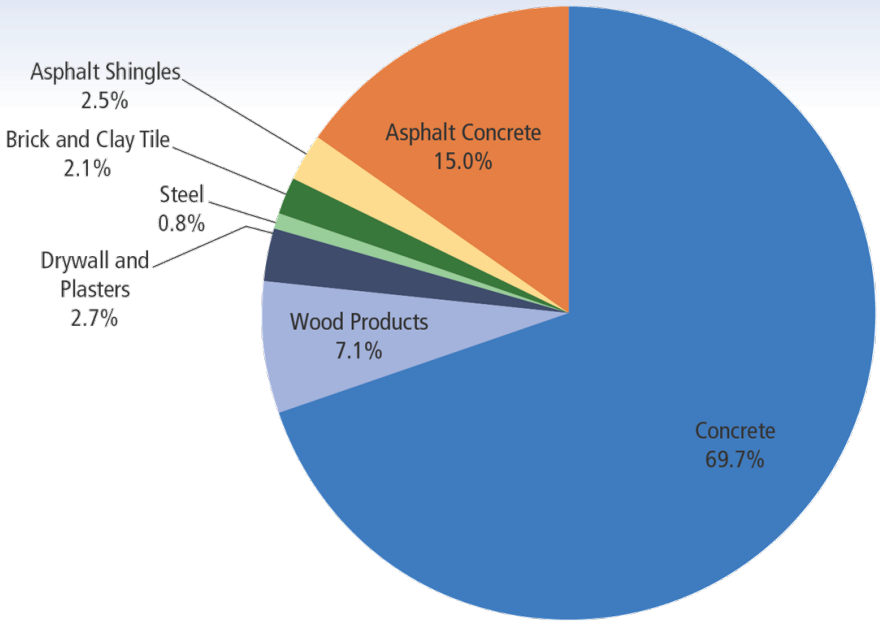


Table 6. C&D Debris Generation by Material and Activity, 2017 (in millions of tons)

	Waste During Construction	Demolition Debris	Total C&D Debris
Concrete	24.0	373.0	397.0
Wood Products[7]	3.3	36.9	40.2
Drywall and Plasters	4.3	11.0	15.3
Steel[8]	0	4.6	4.6
Brick and Clay Tile	0.3	11.9	12.2
Asphalt Shingles	1.4	13.0	14.4
Asphalt Concrete	0	85.7	85.7
Total	**33.3**	**536.1**	**569.4**

[7,8] See endnotes.

Figure 15. Contribution of Construction and Demolition Phases to Total 2017 C&D Debris Generation

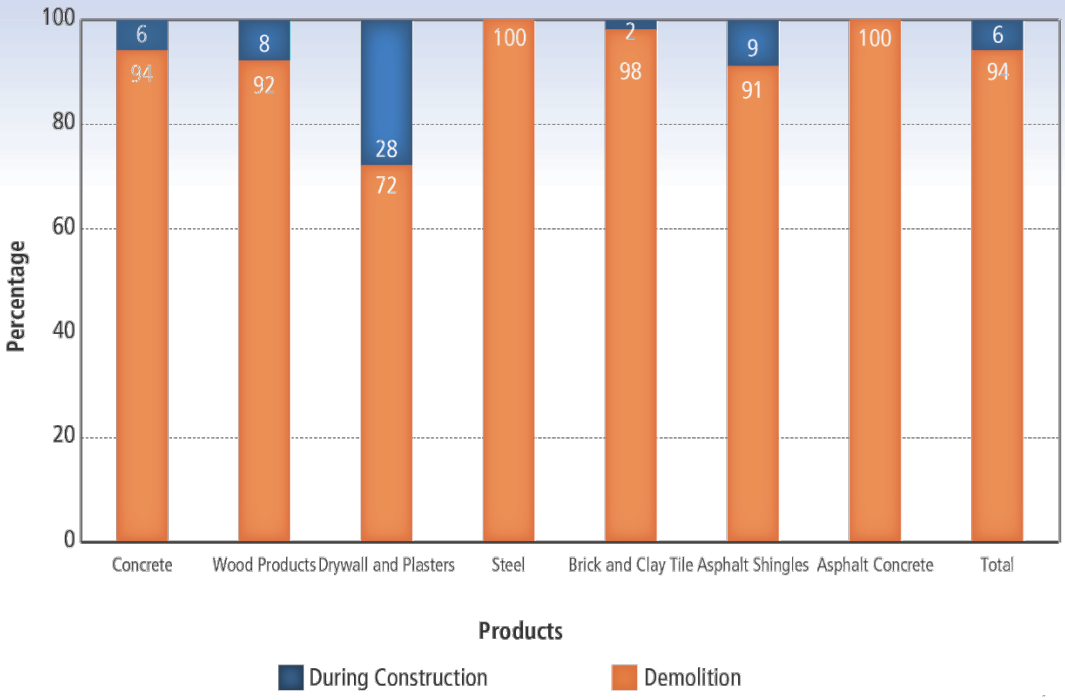


Table 7 displays the amount of C&D debris generation from buildings, roads and bridges, and other structures for each material. The "other structures" category includes C&D debris generation estimates from communication, power, transportation, sewer and waste disposal, water supply, conservation and development, and the manufacturing infrastructure. In 2017, roads and bridges contributed significantly more to C&D debris generation than buildings and other structures, and concrete made up the largest share of C&D debris generation for all three categories.

Table 7. C&D Debris Generation by Source, 2017 (in millions of tons)

	Buildings	Roads and Bridges	Other
Concrete	98.8	164.5	133.7
Wood Products[7]	38.9	-	1.3
Drywall and Plasters	15.3	-	-
Steel[8]	4.6	-	-
Brick and Clay Tile	12.2	-	-
Asphalt Shingles	14.4	-	-
Asphalt Concrete	-	85.7	-
Total	**184.2**	**250.2**	**135.0**

[7,8] See endnotes.

A dash in the table means that data are not available.

Resources

The 2017 data tables and the summary of the MSW characterization methodology are available on the EPA website, along with information about waste reduction, recycling and sustainable materials management.

Please visit:

https://www.epa.gov/facts-and-figures-about-materials-waste-and-recycling
https://www.epa.gov/recycle
https://www.epa.gov/smm
https://www.epa.gov/warm

Endnotes

1. Source for 2002 community composting program data: "The State of Garbage In America." Simmons, Phil, Scott M. Kaufman, and Nickolas J. Themelis. *BioCycle* 47, no. 4, p. 26 (2006). Source for 2017 data: Goldstein, N. 2017, "The State of Organics." *BioCycle*, October, p. 5, Table 2. Facilities composting yard trimmings, yard trimmings and food, and mixed organics. Excludes 740 facilities composting manure, biosolids, mixed MSW or not defined.
2. Sources for food composting collection programs: Streeter, V.; Platt B. 2017. Residential Food Waste Collection Access in the U.S. *BioCycle* December.
3. US EPA. 2016. "Recycling Economic Information Report" (2016). https://www.epa.gov/smm/recycling-economic-information-rei-report. The 2016 REI Report used an updated analytical framework and a new Waste Input-Output methodology, which focused on the life cycle of materials. These refinements offered significant improvements over the original 2001 REI Study by providing a better definition of recycling and addressing double counting. This new methodology assists decision makers and researchers in more accurately estimating the economic benefits of recycling, and it creates a foundation upon which additional studies can be built.
4. Recycled Commodity Values. Soft mixed paper consists of a clean, sorted mixture of various qualities of paper not limited as to type of fiber content. Prohibitive Materials may not exceed 1 percent. There are specific limits on the percent of contaminants allowed in soft mixed paper. Data were not available for ONP, metals, plastics and glass in 1997 and 1998. For plastics, glass and metals, there was a transition in data sources between 1996 and 1999 and between 2004 and 2005, so some of the change between years could be due to the methodology of the data source for capturing data.

   Additional sources include Secondary Materials Pricing and Secondary Fiber Pricing. 2003-2017. Released December 2017. Available at http://www.recyclingmarkets.net/. 1970 to 2004 historical data tabulated from weekly or monthly industry publications and averaged annually during the time periods shown. Publications included Waste Age Recycling Times, Waste News, Paper Recycler, Miller Freeman, Inc.
5. Solid Waste Environmental Excellence Protocol. "No End in Sight to US Landfill Cost Increases — Pacific Region to Experience Highest Growth". June 13, 2018. https://nrra.net/sweep/no-end-in-sight-to-us-landfill-cost-increases-pacific-region-to-experience-highest-growth/
6. MSW Generation: US EPA. 2019. Solid Waste in the United States: 2016 and 2017 Facts and Figures working papers.
   Population: U.S. Census Bureau. Population Division. Annual Estimates of the Resident Population.
   PCE: Bureau of Economic Analysis (BEA). 2019. Tables 2.3.4 and 2.3.5.
7. Wood consumption in buildings also includes some lumber consumed for the construction of other structures. Data were not available to allocate lumber consumption for non-residential and unspecified uses between buildings and other structures except for railroad ties. Since non-residential buildings such as barns, warehouses and small commercial buildings are assumed to consume a greater amount of lumber than other structures, the amount of lumber for construction remaining after the amount for railroad ties is split out is included in the buildings source category.
8. Steel consumption in buildings also includes steel consumed for the construction of roads and bridges. Data were not available to allocate steel consumption across different sources, but buildings are assumed to consume the largest portion of steel for construction.

EPA
United States
Environmental Protection
Agency

United States Environmental Protection Agency
Office of Land and Emergency Management (5306P)
Washington, DC 20460

Official Business
Penalty for Private Use $300

EPA 530-F-19-007

November 2019

APPENDIX 2 B

HISTORY OF SOLID WASTE EVENTS

APPENDIX 2 (revised)
KING GEORGE COUNTY
HISTORICAL CHRONOLOGY OF SOLID WASTE ACTIVITIES

PRE – 1990

- **1971 Permit SWP005** issued for King George County Landfill and transfer station

1990 THROUGH 1999

- **1991** Original SWMP prepared for King George County by Draper Aden Associates
- **1995 Permit SWP586** issued for King George County Landfill incorporated
- **1995-2000** Sealston Tire Pit disposed of in joint project between county and VDEQ Funded through the Waste Tire Trust Fund
- **1996** King George County Landfill and Recycling Center opens
- **1997** County ceases operations of County run Landfill SWP005
- **1999** SWMP updated by county

2000 THROUGH 2010

- **2002** King George County closes transfer station PBR059
- **2004** Transfer of waste from old King George Landfill SWP005 complete
- **2005** SWMP updated by Draper Aden Associates
- **2008 Clean Closure of SWP005**
- **2010** Waste Management Inc. constructed Gas to energy facility at King George Landfill

2011 THROUGH PRESENT

- **2011** Site Planning for conversion of old King George County Landfill site to recreational facility
- **2011** Construction begins on improvements to old King County Landfill Transfer station
- **2014** Completion of Cedell Brooks Jr. Park over the old King George County Landfill site
- **2014** Completion of improvements to old King County Landfill Transfer station
- **2015** SWMP amended by Draper Aden Associates for King George County
- **2016** Permit modification approved increasing SWP586 capacity by 22 million cubic yards with vertical expansion from 45 million cubic yards to 67 million cubic yards.

In 1997 the County ceased operations in the County-owned landfill facility, and began use of a new, regional landfill. It is the single operating sanitary landfill located in King George County. The facility is owned by the County and privately operated and accepts sanitary waste from King George County and waste from outside the County six days a week. The landfill site is located near the intersection of State Routes 3 and 665 and is

operated under permit number 586 issued in December 1996 by the Virginia Department of Environmental Quality. The total site encompasses 630 acres of which 290 acres are permitted for waste disposal.

Under the major modification #15 to SWP 586, approved by DEQ on December 28, 2016, the landfill permit indicated a remaining life of 28 years or through 2045. The 2023 DEQ annual report for this landfill indicates a remaining life of 18.7 years (from December 31, 2022) or through approximately 2041. The current planning period runs from 2023 through 2043 so the remaining life in the landfill as reported for calendar year 2022, will not meet the County's needs by the end of the period. Over the next 20 years, the County will be in discussions with Waste Management about possible expansions or alternative disposal options.

Commercial haulers deliver their waste to the active face of the landfill for disposal. Residents deliver waste to drop off centers located in the County. Residents are not charged for the disposal of household waste and may dispose of up to 4 vehicle tires from a personal vehicle at one time with no charge.

There is a recycling drop-off center located at the landfill that currently accepts white goods and scrap metal, aluminum cans, glass bottles, newspapers, batteries, and waste oil and anti-freeze, and yard waste.

APPENDIX 3 A

EXISTING POPULATION

APPENDIX 3-A (revised)

KING GEORGE COUNTY POPULATION
2000 - 2023

Source	*Year*	*Population*
Census	**2000**	**16,803**
Weldon Cooper Center	**2001**	**16,994**
Weldon Cooper Center	**2002**	**17,488**
Weldon Cooper Center	**2003**	**18,052**
Weldon Cooper Center	**2004**	**19,213**
Weldon Cooper Center	**2005**	**20,313**
Weldon Cooper Center	**2006**	**20,862**
Weldon Cooper Center	**2007**	**22,094**
Weldon Cooper Center	**2008**	**22,808**
Weldon Cooper Center	**2009**	**23,234**
Census	**2010**	**23,584**
Weldon Cooper Center	**2011**	**23,397**
Weldon Cooper Center	**2012**	**23,929**
Weldon Cooper Center	**2013**	**24,408**
Weldon Cooper Center	**2014**	**24,787**
Weldon Cooper Center	**2015**	**24,944**
Weldon Cooper Center	**2016**	**25,078**
Weldon Cooper Center	**2017**	**25,222**
Weldon Cooper Center	**2018**	**25,644**
Weldon Cooper Center	**2019**	**26,084**
Census	**2020**	**26,783**
Weldon Cooper Center	**2021**	**27,021**
Weldon Cooper Center	**2022**	**27,645**
Weldon Cooper Center	**2023**	**27,719**

Weldon Cooper Center for Public Service Demographics Research Group
https://demographics.coopercenter.org
2011 through 2023 updated from 1/30/23 and 1/29/24 reports

APPENDIX 3 B

POPULATION PROJECTIONS

APPENDIX 3-B (revised)

KING GEORGE COUNTY POPULATION PROJECTIONS
2024 – 2040
(2010 through 2023 from Weldon Cooper Data)

Year	*Weldon Cooper*
2010 (census)	**23,584**
2011	23,397
2012	23,929
2013	24,408
2014	24,787
2015	24,944
2016	25,078
2017	25,222
2018	25,644
2019	26,084
2020 (census)	**26,783**
2021	27,021
2022	27,645
2023	27,719
2024 (calculated)	28,271
2025(EST.)	**28,824**
2026	28,946
2027	29,068
2028	29,190
2029	29,312
2030 (EST.)	**29,434**
2031	29,879
2032	30,324
2033	30,769
2034	31,214
2035(EST.)	**31,660**
2036	32,105
2037	32,550
2038	32,995
2039	33,440
2040 (EST.)	**33,887**
2041	34,383
2042	34,879

Year	*Weldon Cooper*
2043	35,375
2044	35,871
2045 (EST.)	**36,367**
2050 (EST.)	**38,847**

2011 through 2050 updated with new Weldon Cooper Center information from 1/30/23 and 1/29/24 data.

Weldon Cooper Center for Public Service Demographics Research Group
https://demographics.coopercenter.org

APPENDIX 3 C

VEC COMMUNITY PROFILE 2019

Virginia

COMMUNITY PROFILE

King George County

Virginia Employment Commission
Economic Information & Analytics Division

6606 West Broad Street , Richmond, Virginia 23230
Tel: (804) 786-7496 Email:veclmi@vec.virginia.gov
https://virginiaworks.com

www.VirginiaLMI.com
LMI
labor market information

Last updated: 3/6/2024 1:25:02 AM

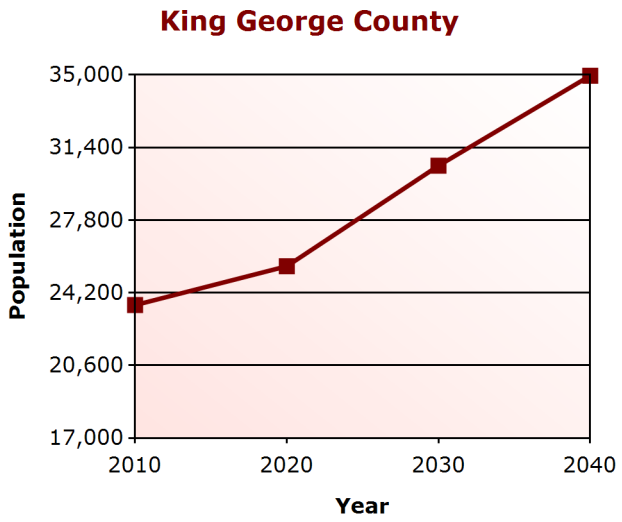
I. Introduction

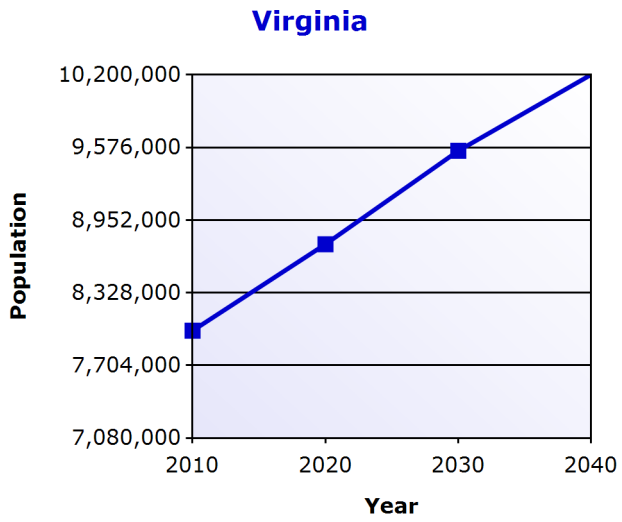
This report provides a community profile of King George County. It is intended to complement the information found in our Virginia Workforce Connection application, which can be accessed online at:

www.VirginiaLMI.com

The report is divided into three major sections. The first contains a profile of regional demographic characteristics and trends, the second supplies similar information for the regional economy, and the third provides a profile of regional education characteristics.

Population Change





	King George County	Percent change	Number Change	Virginia	Percent change	Number Change
2000	16,803			7,079,030		
2010	23,584	40.36 %	6,781	8,001,024	13.02 %	921994
2020	25,510	8.17 %	1,926	8,744,273	9.29 %	743249
2030	30,494	19.54 %	4,984	9,546,958	9.18 %	802685
2040	34,955	14.63 %	4,461	10,201,530	6.86 %	654572

Source: U.S. Census Bureau, Weldon Cooper Center for Public Service.

Did you know...

you can log on to our website today and see population counts from each Decennial Census all the way back to 1900? Looking for annual population estimates? We have those too, all the way back to the 1970s!

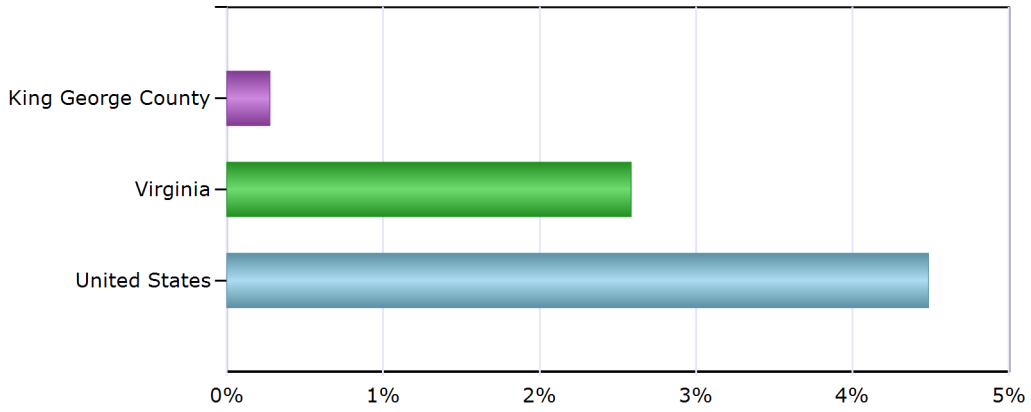
For this data and more, visit us on the web at:

www.VirginiaLMI.com

United States™ Census 2010

English Language Skills

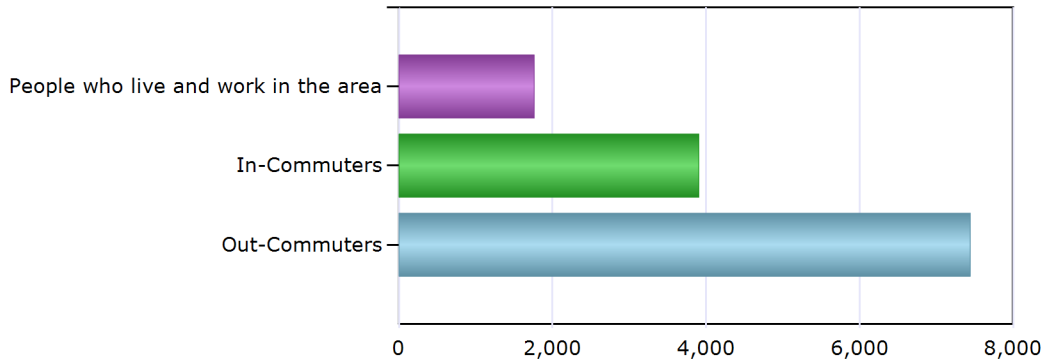
(Age 5 and over that speak English less than well)



	Total	Speak English less than well	Percent
King George County	23,621	65	0.28%
Virginia	7,800,044	201,628	2.58%
United States	298,691,202	13,400,003	4.49%

Source: U.S. Census Bureau
American Community Survey, 2012-2016.

Commuting Patterns



Commuting Patterns	
People who live and work in the area	1,761
In-Commuters	3,906
Out-Commuters	7,441
Net In-Commuters (In-Commuters minus Out-Commuters)	-3,535

Source: U.S. Census Bureau,
OnTheMap Application and LEHD Origin-Destination Employment Statistics, 2014.

Top 10 Places Residents are Commuting To

Area	Workers
Fairfax County, VA	1,088
Stafford County, VA	855
Spotsylvania County, VA	736
Fredericksburg city, VA	618
District of Colu, DC	603
Charles County, MD	516
Prince William County, VA	424
Arlington County, VA	279
Alexandria city, VA	251
Loudoun County, VA	187

Top 10 Places Workers are Commuting From

Area	Workers
Spotsylvania County, VA	534
Westmoreland County, VA	493
Stafford County, VA	396
Fairfax County, VA	199
Prince William County, VA	197
Charles County, MD	168
Fredericksburg city, VA	139
Caroline County, VA	124
Virginia Beach city, VA	96
Loudoun County, VA	83

Source: U.S. Census Bureau,
OnTheMap Application and LEHD Origin-Destination Employment Statistics, 2014.

Please Note: Commuting patterns data is no longer produced from the Decennial Census. As an alternative, we are providing commuting data from the U.S. Census Bureau's OnTheMap application and LEHD Origin-Destination Employment Statistics program. Since this data is produced from an entirely different data set, it is not advisable to compare the new data with previously released commuting patterns. For more information about the OnTheMap application or the LEHD program, please visit the following website:

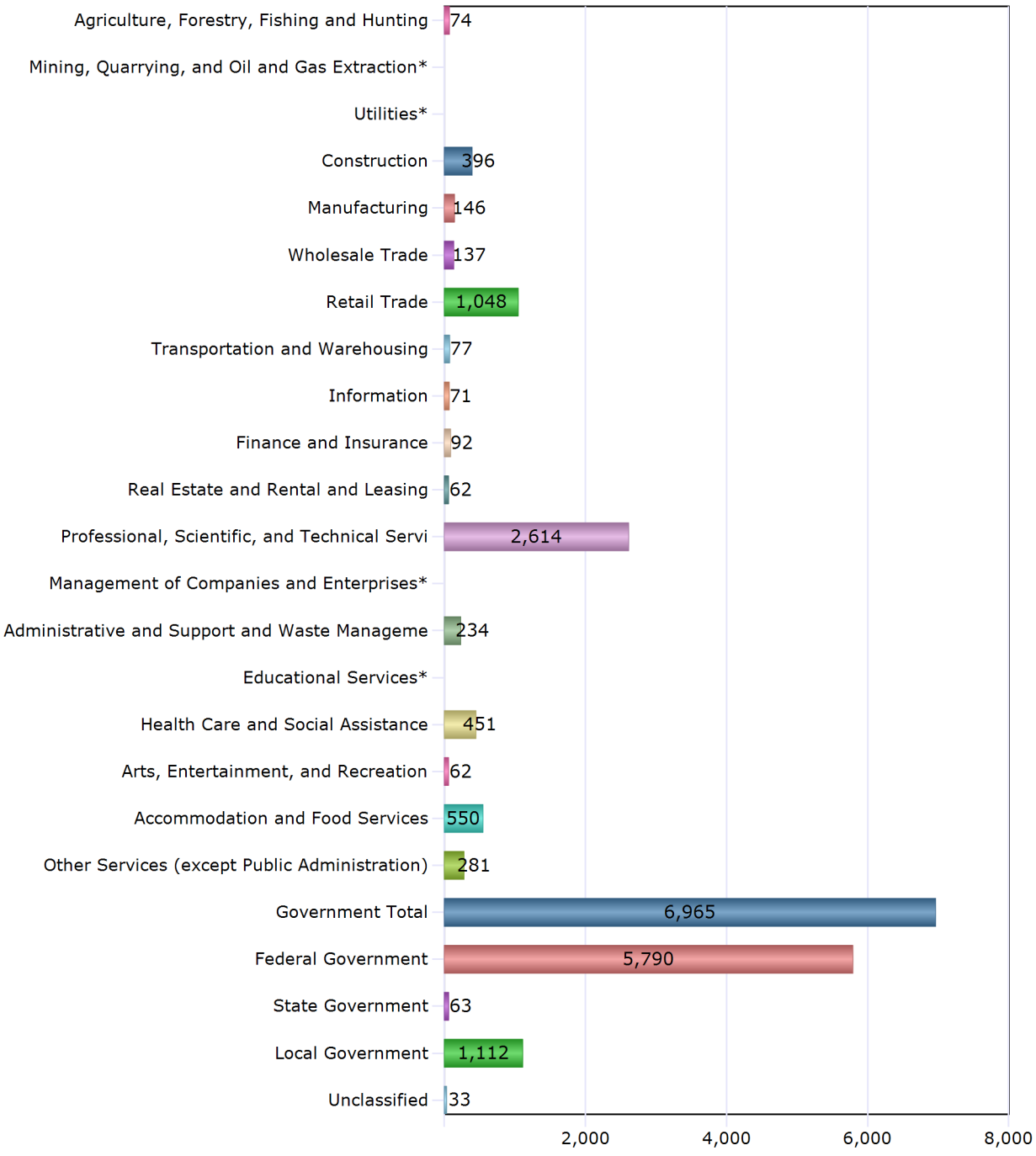
http://lehd.ces.census.gov

50 Largest Employers

1. U.S. Department of Defense
2. King George County Public School Board
3. Tatitlek Technologies Inc
4. County Of King George
5. URS Federal Services
6. Southestrn Comp Consts Inc
7. Wal Mart
8. Booz, Allen and Hamilton
9. Food Lion
10. Technology Service Corporation
11. Lockheed Martin
12. Basic Commerce & Industries Inc
13. Tech Wizards Inc.
14. YMCA
15. LinTech Global, Inc.
16. Heritage Hall
17. Hargo LLC
18. Caci
19. Fresh Tulips USA LLC
20. Anteon Corporation
21. Resource Management Concepts Inc
22. Bowhead Tech And Prof Services
23. Mantech Advanced Systems Inc
24. Cmc Steel Us LLC
25. Atlantic Broadband Finance LLC
26. NSWC Federal Credit Union
27. WaWa
28. McDonald's
29. Mary Washington Hospital
30. Northrop Grumman Corporation
31. King George Landfill
32. Bayside Ford
33. Crabmandoo Water Sports
34. Valkyrie Enterprises LLC
35. T J Maxx
36. Solutions Development Corp
37. Hart Technologies Inc
38. Parsons Government Services Inc
39. Postal Service
40. Walker Sand & Stone Inc
41. Bayside Chrysler Dodge Jeep Ram
42. Bonnie Plants, Llc
43. Local Services LLC
44. Faddis Concrete Products INC
45. Sheetz
46. Tractor Supply Company
47. Eagles Nest Animal Hospit Inc.
48. Ihop 3620
49. Administaff
50. The Nest School

Source: Virginia Employment Commission, Economic Information & Analytics,
Quarterly Census of Employment and Wages (QCEW), 3rd Quarter (July, August, September) 2023.

Employment by Industry



Total: 13,404

Note: Asterisk (*) indicates non-disclosable data.

Source: Virginia Employment Commission, Economic Information & Analytics,
Quarterly Census of Employment and Wages (QCEW), 3rd Quarter (July, August, September) 2023.

Industry Employment and Projections

Long Term (Period= 30)

	Employment			Percent	
	Estimated 2020	Projected 2030	Change	Total	Annual
Total, All Industries	165,611	186,873	21,262	12.84%	1.22%
Total Self-Employed and Unpaid Family Workers	11,700	12,206	506	4.32%	.42%
Agriculture, Forestry, Fishing and Hunting	6,910	7,935	1,025	14.83%	1.39%
Mining	221	167	-54	-24.43%	-2.76%
Mining, Quarrying, and Oil and Gas Extraction	221	167	-54	-24.43%	-2.76%
Utilities	***	***	***		***
Construction	8,136	9,093	957	11.76%	1.12%
Manufacturing	7,669	8,045	376	4.9%	.48%
Wholesale Trade	***	***	***		***
Retail Trade	20,862	20,544	-318	-1.52%	-.15%
Transportation and Warehousing	4,715	5,770	1,055	22.38%	2.04%
Information	1,159	1,054	-105	-9.06%	-.95%
Finance and Insurance	6,795	7,711	916	13.48%	1.27%
Real Estate and Rental and Leasing	1,786	1,844	58	3.25%	.32%
Professional, Scientific, and Technical Services	11,031	12,613	1,582	14.34%	1.35%
Management of Companies and Enterprises	2,015	2,371	356	17.67%	1.64%
Administrative and Support and Waste Management and Remediation Services	6,334	6,941	607	9.58%	.92%
Educational Services	15,462	18,697	3,235	20.92%	1.92%
Health Care and Social Assistance	18,632	22,792	4,160	22.33%	2.04%
Arts, Entertainment, and Recreation	1,672	2,460	788	47.13%	3.94%
Accommodation and Food Services	14,382	17,886	3,504	24.36%	2.2%
Other Services (except Public Administration)	5,695	6,531	836	14.68%	1.38%
Unclassified	15,406	17,039	1,633	10.6%	1.01%

Note: Asterisks (***) indicate non-disclosable data.
Projections data is for Bay Consortium (LWDA XIII). No data available for King George County.

Source: Virginia Employment Commission, Economic Information & Analytics,
Long Term Industry and Occupational Projections, 2020-2030.

APPENDIX 4 A

HISTORICAL WASTE PRODUCTION

APPENDIX 4-A (revised)
HISTORICAL WASTE GENERATION
KING GEORGE COUNTY
2001-2020
VDEQ 50-30 Form Filings

Year	*Recycle rate%*	*Tons of MSW disposed*
2001		14013
2002		13570
2003		19529
2006	13%	17000
2007	15%	17683
2008	20%	17311
2009	20%	15244
2010	30%	11559
2011	38%	11224
2012	44%	7892.0
2016	56%	31595
2018	54%	11902
2020	31.8%	13,962

Source: VDEQ 50-30 Recycling Rate Report

APPENDIX 4 B

ESTIMATED FUTURE WASTE PRODUCTION

APPENDIX 4-B (revised)
WASTE PRODUCTION PROJECTIONS
KING GEORGE COUNTY
2001-2050

Year	*Population*	*Tons MSW/year*	*Pounds per Day per person*
2001	16,994	14,013	4.5
2002	17,488	13,570	4.3
2003	18,052	19,529	5.9
2006	20,862	17,000	4.5
2007	22,094	17,683	4.4
2008	22,808	17,311	4.2
2009	23,234	15,244	3.6
2010	23,584	11,559	2.7
2011	23,397	11,224	2.6
2012	23,929	7,892	1.8
2016	25,078	31,595	7.0
2018	25,644	11,700	2.5
2019	26,084	21,495	4.5
2020	26,783	21,705	4.5
2025	28,824	23,672	4.5
2030	29,434	25,502	4.5
2035	31,660	27,244	4.5
2040	33,887	28,892	4.5
2043	35,375	29,052	4.5
2045	36,367	29,866	4.5
2050	38,847	31,903	4.5

Population Projections for 2025 through 2050 are based on Weldon Cooper estimates.

Population for 2001 through 2020 is based on Weldon Cooper data.

Tonnage Estimates for 2019 through 2050 based on EPA published value of 4.5 from 2019-2050.

Tonnage Estimates for 2001 through 2018 calculated based on data from County.

APPENDIX 4 C

CATEGORIZED WASTE PRODUCTION

APPENDIX 4-C (revised)
WASTE GENERATION PROJECTIONS BY CATEGORY
KING GEORGE COUNTY
2015-2045

Population Projections (from SWMP)		**2015**	**2020**	**2025**	**2030**	**2035**	**2040**	**2045**
		24,600	26,783	28,824	29,434	31,660	33,887	36,367
WASTE CATEGORY (1)(2)	**Estimated Pounds/person/day**	**2015 tons**	**2020 tons**	**2025 tons**	**2030 tons**	**2035 tons**	**2040 tons**	**2045 tons**
MSW - Residential (80% of per capita generation)	3.14	14,079	12,709	13,677	13,966	15,023	16,079	17,256
MSW - Commercial (20% of per capita generation)	.78	3,520	6,843	7,365	7,520	8,089	8,658	9,292
Vegetative yard waste	0.59	2,649	2,444	2,630	2,686	2,889	3,092	3,318
Industrial (5%)	0.15	673	733	789	806	867	928	996
Sludge	0.01	45	49	53	54	58	62	66
Subtotal	4.67	20,966	22,778	24,513	25,032	26,925	28,819	30,928

WASTE CATEGORY (3)	Estimated Pounds/person /day	2015 tons	2020 tons	2025 tons	2030 tons	2035 tons	2040 tons	2045 tons
Regulated medical waste (RMW)	0.004	18	83	89	91	98	105	113
Household Hazardous waste (HHW)	0.02	94	103	110	113	121	130	139
CDD as estimated by EPA	2.80	12,571	13,686	14,729	15,041	16,178	17,316	18,584
Construction waste (51% of CDD)	1.42	6,375	6,941	7,470	7,628	8,205	8,782	9,425
Demolition waste (47% CDD)	1.32	5,908	6,432	6,923	7,069	7,604	8,139	8,734
Land clearing debris (1.7% of CDD)	0.05	214	233	250	256	275	294	316
Stumps (0.3% of CDD)	0.09	415	452	486	496	534	571	613
Motor vehicle tires (1 tire per year per person @ 20 pounds per tire)	0.05	0.67	268	288	294	317	339	364
Waste Oil (3.56 gallons per vehicle per year @ 7.4 lb/gallon)	0.09	411	467	502	513	552	591	634
Antifreeze (1.8 gallons per vehicle every 4 years @ 8.4 lb/gallon)	0.01	59	67	72	74	79	85	91
Batteries (0.05 lb/per/day)	0.05	224	196	210	215	231	247	265
White goods (0.015)lb/per/day)	0.015	67	342	368	376	404	433	465
Subtotal	3.05	13,445	15,211	16,370	16,717	17,981	19,246	20,654
TOTAL	7.7	34,411	37,989	40,884	41,749	44,906	48,065	51,583
Registered Vehicles - 2007	31,203							

NOTES:

1. Waste tonnage for MSW and yard waste taken from EPA, report entitled, Advancing Sustainable Materials Management: 2017 Fact Sheet.
    - MSW was estimated to be 4.51 pounds per person per day which would include 13% yard trimmings. Thus, MSW taken at 3.92 pounds per person per day and yard trimmings at 0.59 pounds per person per day.
    - Residential determined using VADEQ RRR King George 2012, 16, 18 to estimate that residential waste is approximately 80% of the MSW waste stream.
    - Commercial determined using VADEQ RRR King George 2012, 16, 18 to estimate that commercial waste is approximately 20% of the MSW waste stream.
    - Industrial determined using VADEQ RRR King George 2012, 16, 18 to estimate that Industrial waste is approximately 5% of the MSW waste stream.
2. Waste tonnage for sludge was evaluated against estimates reported for other Cities (Bristol, VA and Newport News, VA) Urban tonnages 2.0 and 0.5 pounds per person per day respectively. These have been modified for Amherst based on Form 50-25 records.

3. Special wastes per capita values taken from a number of sources as follows:
    - RMW - Virginia average total tons/population for 2015-2018 from VADEQ Annual Solid Waste Reports
    - HHW - From www.cdphe.state.co.us/hm/hhw/hhw/asp
    - CDD - From EPA, Franklin & Associates, "Characterization of Building Related Construction and Demolition Debris in the United States, June 1998.[1]
    - From Florida Center for Solid and Hazardous Waste Management, "Generation and Composition of Construction and Demolition Debris in Florida," Report #03-08, February 27, 2003
    - Tires - VA DEQ Tire program
    - Waste Oil - American Petroleum Institute, Study model.
    - Antifreeze - VA Used Oil program estimate.
    - Batteries -EPA, facts-and-figures-about-materials-waste-and-recycling/durable-goods-product, 2017 Update.[2]
    - White Goods -from VADEQ Annual Solid Waste Reports average total tons/population for 2015-2018

[1] https://www.epa.gov/sites/production/files/2018-09/documents/construction_and_demolition_debris_generation_in_the_united_states_2015_final.pdf
[2] https://www.epa.gov/facts-and-figures-about-materials-waste-and-recycling/durable-goods-product-specific-data#LeadAcidBatteries

APPENDIX 4 D

2012 RECYCLING RATE REPORTING FORM

Commonwealth of Virginia
Locality Recycling Rate Report
For Calendar Year 2012

VIRGINIA DEPARTMENT OF ENVIRONMENTAL QUALITY

Contact Information

Reporting Solid Waste Planning Unit: King George County

Person Completing This Form: A. Travis Quesenberry

Tirtle: County Administrator

Address: 10459 Courthouse Dr. Suite 200, King George Va. 22485
Street/P.O. Box City State Zip

Phone #: (540) 775-9181 **Fax #:** (540) 775-5248

Email Address: TQuesenberry@co.kinggeorge.state.va.us

Member Governments (The local governments identified in your regional solid waste management plan and whose data is included in this report)**:**

Due to the complexity and difficulty in obtaining data, this report reflects the best efforts of the solid waste planning unit to represent its recycling efforts for **CY 2012**. I certify that I have personally examined and am familiar with the information submitted in this form and any attached documents, and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the submitted information is true, accurate, and complete. These records will be made available for auditing purposes, if requested.

Authorized Signature | County Administrator Title | 4/16/13 Date

Return completed form by April 30, 2013 to: Virginia DEQ, Attn: Recycling Rates, P.O. Box 1105, Richmond, VA 23218.

Locality Recycling Rate Report — For Calendar Year 2012

PART A: Recycling Rate Calculation - Using the formulae provided below and the information reported on Pages 3, 4 and 5 to calculate your recycling rates.

Step 1: [(PRMs) / (PRMs + MSW Disposed)] X 100 = Base Recycling Rate %

5217	/	5217	+	7891.95	X 100 =	39.79	%

Step 2: CREDITS calculation

a. Total Recycling Residue	88397	tons
b. Total Solid Waste Reused	38021	tons
c. Total Non-MSW Recycled		tons
CREDITS	126418	tons

Step 3: [(PRMs + CREDITS) / (PRMs + CREDITS + MSW Disposed)] X 100 = Adjusted Recycling Rate #1*

5217	+	126418	/	5217	+	126418	+	7891.95	X 100 =	94.34	%

Step 4: [X] **Source Reduction Credit does not apply; or**

[ ] **Adjusted Recycling Rate #1 + 2% SRP Credit = Adjusted Recycling Rate #2***

	%	+ 2%	=		%

Step 5: Final Recycling Rate* for Solid Waste Planning Unit = 39.79 **%**

*** Total credits resulting from Steps 3 and 4 may not exceed 5 percentage points above the Base Recycling Rate achieved by the Solid Waste Planning Unit.**

Locality Recycling Rate Report
PART B: DATA

For Calendar Year 2012

Part I: Principal Recyclable Materials (PRMs): Report only PRM material generated within the reporting SWPU and recycled, NOT imported PRMs for recycling.

PRM TYPE	RECYCLED AMOUNT (TONS)
Paper	
Metal	1875
Plastic	
Glass	
Commingled (also known as Single Stream)	784
Yard Waste (composted or mulched)	
Waste wood (chipped or mulched)	1750
Textiles	
Tires	694
Used Oil	51
Used Oil Filters	
Used Antifreeze	
Batteries	36
Electronics	
Inoperative Motor Vehicles (see guidance)	
Other (specify: _____)	
Other (specify: _____)	
TOTAL PRMs	**5217 (PRMs)**

(Enter Total on Page 2, Step 1)

Part II: Credits by Category (see Credits Worksheet, Page 5)

A. Recycling Residue – "Recycling residue" means the (i) nonmetallic substances, including but not limited to plastic, rubber, and insulation, which remain after a shredder has separated for purposes of recycling the ferrous and nonferrous metal from a motor vehicle, appliance, or other discarded metallic item and (ii) organic waste remaining after removal of metals, glass, plastics and paper which are to be recycled as part of a resource recovery process for municipal solid waste resulting in the production of a refuse derived fuel. (§ 10.1-1400 of the *Code of Virginia*) (use only SWPU generation)

MATERIAL DESCRIPTION		FACILITY/OPERATION	TONS OF MATERIAL
Auto silt	from	Jos, Smith	88,397
	from		
	from		

TOTAL RECYCLING RESIDUE **88,397**

(Enter Total on Page 2, Step 2 a)

Locality Recycling Rate Report **For Calendar Year 2012**

B. Solid Waste Re-Used

MATERIAL DESCRIPTION	REUSE METHOD	TONS OF MATERIAL
Coal Fired Ash	used as Daily cover	38,021
	TOTAL SOLID WASTE REUSED	**38,021**

(Enter Total on Page 2, Step 2 b)

C. Non-Municipal Solid Waste (MSW) Recycled

MATERIAL DESCRIPTION	RECYCLING METHOD	TONS OF MATERIAL
	TOTAL NON-MSW RECYCLED	

(Enter Total on Page 2, Step 2 c)

D: A credit of two (2) percentage points may be added to the Adjusted Recycling Rate #1 if the Solid Waste Planning Unit has implemented a Source Reduction Program (SRP). Examples of SRPs include Grasscycling, Home Composting, Clothing Reuse, Office Paper Reduction (duplexing), Multi-Use Pallets, or Paper Towel Reduction. The SRP must be included in the Solid Waste Management Plan on file with the Department:

SRP description: _____

SRP description: _____

SRP description: _____

(Certify on Page 2, Step 4)

Exclusions: **For the purposes of this report, the following materials are not considered solid wastes, and should not be included in any of the data categories utilized in calculating the recycling rate.**

1. **Biosolids –industrial sludge, animal manures; or, sewage sludge (unless composted)**
2. **Automobiles – unless part of the Inoperable Vehicle Program (DMV)**
3. **Leachate**
4. **Soils – contaminated soils, soil material from road maintenance**
5. **Household hazardous waste**
6. **Hazardous waste**
7. **Medical waste**
8. **Rocks or stone**

Locality Recycling Rate Report — For Calendar Year 2012

Part III: Total Municipal Solid Waste (MSW) Disposed** - Report only MSW generated within the reporting jurisdiction(s), NOT imported wastes or industrial wastes.

MSW TYPE	TOTAL AMOUNT DISPOSED (TONS)
Household	6424
Commercial	1117.95
Institutional	350
Other (DO NOT INCLUDE INDUSTRIAL WASTES)	
TOTAL MSW DISPOSED	**7891.95** **(Enter Total on Page 2, Step 1 and Step 3)**

****MSW DISPOSED** for the purpose of this report means delivered to a permitted sanitary landfill, transfer station, or waste incinerator for disposal.*

2012 Recycling Rate Reporting

PRMs	As Submitted	Changes	SWPU King George County		4/9/13
			Submitted RR:	39.8%	
Paper	0		**DEQ Adjusted RR:**		
Metal	1875				
Plastic	0				
Glass	0		**Calculations:**	SWPU	DEQ
Commingled	784		PRMs/(PRMs + M) x 100	39.7%	#DIV/0!
Yard Waste	0				
Waste Wood	1750				
Textiles	0				
Tires	694		(PRMs+C)/(PRMs+C+M) x 100	84.6%	#DIV/0!
Used Oil	51				
Used Oil Filters	0				
Used Antifreeze	0				
Batteries	36		M = MSW		
Electronics	0		C = Credits		
Inoperative Motor Vehicles	0				
Other	0				
Other	0				
Total:	5190	0			
MSW:					
Household	6424				
Commercial	1117.95				
Institutional	350				
Other	0		Base Recycling Rate	39.7%	#DIV/0!
Total:	7891.95	0			
Credits:					
Recycling Residue	0				
			Adjusted RR # 1	84.6%	#DIV/0!
Solid Waste Reused	38021				
coal ash			Adjusted RR # 2	84.6%	#DIV/0!
Non MSW Recycled	0				
			(Max of 5%) Credits:	44.7%	#DIV/0!
Credits Total Tons	38021	0			
			Final RR:	44.7%	#DIV/0!
Source Reduction	0.00%	0.00%			

Notes:

APPENDIX 4 E

2016 RECYCLING RATE REPORTING FORM

Commonwealth of Virginia
Locality Recycling Rate Report
Calendar Year 2016

DEQ Form 50-30 (Revised December 2016)

Email completed form to: virginia.butler@deq.virginia.gov

Solid Waste Planning Unit Information (Enter in Rows 4 - 14.)

Solid Waste Planning Unit	King George County
Preparer's Name	Jeff Jenkins
Preparer's Title	Director of Solid Waste
Address Line 1	10459 Courthouse Dr., Suite 200
Address Line 2	King George, VA 22485
Address Line 3	
Phone Number	540-775-9481
Email address	jjenkins@co.kinggeorge.state.va.us
Date	4/18/2017

Total Population for SWPU	24,724	**Population Density for SWPU**	128
Mandated Recycling Rate (15% or 25% will auto calculate)	25%	**Reporting Frequency**	Every 4 years

Enter tons (whole numbers only) in the yellow highlighted boxes for PRMs and MSW Disposed. Totals will auto calculate.

Principal Recyclable Materials (PRM)

PRM Material	Tons recycled
Paper	1,604
Metal	356
Plastic	0
Glass	0
Commingled	1,910
Yard Waste	0
Waste Wood	2,737
Textiles	0
Waste Tires	256
Used Oil	3
Used Oil Filters	0
Used Antifreeze	1
Batteries	0
Electronics	2
Inoperative Motor Vehicles	338
Dahlgren	33,531

MSW Disposed	
Household Waste	25,279
Commercial Waste	6,316
Institutional Waste	
Other	
Total MSW	**31,595**

Other (Specify)	0
Total PRM in Tons	**40,739**

Enter facility information and material in columns A and B. Enter tons (whole numbers only) in the yellow highlighted boxes. Totals will auto calculate.

Credits Recycling Residue

Facility/Operation	Material	Tons
Joseph Smith	Auto Silt	139,379
Total		139,379

Credits Solid Waste Reused

Reuse Method	Material	Tons
Used as daily cover	Coal Fired Ash	273,284
Total		273,284

Credits Non-MSW recycled

Recycling Method	Material	Tons
		0
Total		0

CREDITS TOTAL 412,663

Credit for Source Reduction Program (SRP)
SRP does not apply enter "0"
SRP does apply enter "2"
0%

Recycling rates auto calculate.

Base Recycling Rate	**56.3%**	Base Rate
Adjusted Recycling Rate	**93.5%**	Rate with credits
Adjusted Recycling Rate + SRP	**93.5%**	Credits + SRP
Credit Max Allowed Base +5	**61.3%**	
Final Recycle Rate	**61.3%**	Final Recycle Rate

Sources for PRM Data *Example: Permit #112, County Landfill*	County Convenience Centers, King George Tire, Walmart, King George Auto Parts, Duffield Hauling, Naval Surface Warfare Center Dahlgren Division

APPENDIX 4 F

2018 RECYCLING RATE REPORTING FORM

DEQ
VIRGINIA DEPARTMENT OF ENVIRONMENTAL QUALITY

Commonwealth of Virginia
Locality Recycling Rate Report
DEQ Form 50-30 (Revised September 2018)

Date Submitted 4/26/19

2018

Solid Waste Planning Unit
Click on the adjacent cell for drop down menu **King George County**

SWPU Web Page

	Contact 1		Contact 2
Name	Jacqueline Ferris		
Title	Operations Manager		
Address Line 1	10376 Bullock Drive, King George VA 22485		
Address Line 2			
Address Line 3			
Phone Number	5406568661		5407753176 office
Email address	jferris@co.kinggeorge.state.va.us		
Total Population for SWPU	26,575	**SWPU Population Density**	
Mandated Recycling Rate (% will auto calculate)	15%	**Reporting Frequency** (Will auto calculate)	Every 4 years
Sources for PRM Data *Example: Permit #112, County Landfill*	King George County Solid Waste & Recycling, County Convenience Centers		
Other Sources for collected data *Example: Walmart/Target*	Heritage Crystal Clean, King George Tire, Duffield, Northern Neck Auto, County Waste, Walmart, Local services, Dalghren Naval base, Verizon, Food Lion, T&C Roll off, Emanuel Tire		
Comments:			

Enter tons (whole numbers only) in the yellow highlighted boxes for PRMs and MSW Disposed.Totals will auto calculate.

Principal Recyclable Materials (PRM)	
PRM Material	Tons recycled
Paper	26
Metal	1,141
Plastic	
Glass	
Commingled	906
Yard Waste	1,812
Waste Wood	895
Textiles	
Waste Tires	4,886
Used Oil	22
Used Oil Filters	
Used Antifreeze	6
Batteries	23
Electronics	96
Inoperative Motor Vehicles	1,901
Other Total (Specify Material and tonnage on Rows 24 - 39 to the right.)	6
Total PRM in Tons	**11,720**

Specify Other PRMs for Row 39	
PRM Material	Tons recycled
Fluor Lamps	0.04
Toner Cartridges	6
Other Total	6

MSW Disposed	
Household Waste	10,325
Commercial Waste	
Institutional Waste	
Other	1,577
Total MSW	**11,902**

Credit for Source Reduction Program
SRP does not apply enter "0". SRP does apply enter "2"
2%

Enter facility information and material in columns A and B. Enter tons (whole numbers only) in the yellow highlighted boxes. Totals will auto calculate.

Credits Recycling Residue

Facility/Operation	Material	Tons
Joseph Smith	Auto Silt	53,152
United Iron & Metals	Auto Silt	1,608
Total		54,760

Credits Solid Waste Reused

Reuse Method	Material	Tons
Birchwood Power Facility	Coal Fired Ash	52,580
Total		52,580

Credits Non-MSW recycled

Recycling Method	Material	Tons
Total		0
CREDITS TOTAL		107,340

Recycling rates auto calculate.

Base Recycling Rate	49.6%
Adjusted Recycling Rate	90.9%
Adjusted Recycling Rate + SRP	92.9%
Credit Max Allowed Base +5	54.6%
Final Recycle Rate	54.6%

2017 Recycling totals

- Comingled = 2291.82 Tons
- Metal = 3721.74 Tons
- Batteries = 457.15
- Wood, Yard waste, Mulch = 564.61 Tons
- Tires = 111.95 Tons
- Electronics = 0.10
- Fluorescent Lamps = 0.001

APPENDIX 4 G

2020 RECYCLING RATE REPORTING FORM

Commonwealth of Virginia
Locality Recycling Rate Report
DEQ Form 50-30 (Revised September 2018)

Date Submitted 4/17/21

Calendar Year CY2020

Solid Waste Planning Unit
Click on the adjacent cell for drop down menu

King George County

SWPU Web Page https://www.king-george.va.us/248/Solid-Waste-Recycling

	Contact 1		Contact 2
Name	Michael Newchok		Jeff Jenkins
Title	Landfill Operations Manager		Director, Soild Waste and Recycling
Address Line 1	10376 Bullock Drive		10376 Bullock Drive
Address Line 2	King George, VA 22485		King George, VA 22485
Address Line 3			
Phone Number	(540) 656-8661		540-273-9713
Email address	mnewchok@co.kinggeorge.state.va.us		jjenkins@co.kinggeorge.state.va.us
Total Population for SWPU	26,836	**SWPU Population Density**	149
Mandated Recycling Rate (% will auto calculate)	25%	**Reporting Frequency** (Will auto calculate)	Every 4 years
Sources for PRM Data *Example: Permit #112, County Landfill*	Waste Management (operates the King George County Landfill). King George County Department of Solid Waste & Recycling.		
Other Sources for collected data *Example: Walmart/Target*	Walmart, Food Lion, CVS, Goodwill, Waste Management, Heritage Crystal Clean, VA Biodiesel, Emanuel Tire, Clothes Bin, M&C Metals, T&C, County Waste, Bushrod Hauling, Dahlgren Naval Base, Summit, Shiflett's, Wawa, Sheetz, KG Truck & Tire, KG Tire		
Comments:			

Enter tons (whole numbers only) in the yellow highlighted boxes for PRMs and MSW Disposed.Totals will auto calculate.

Principal Recyclable Materials (PRM)	
PRM Material	**Tons recycled**
Paper	1,058
Metal	1,141
Plastic	15
Glass	
Commingled	1,519
Yard Waste	25
Waste Wood	881
Textiles	248
Waste Tires	84
Used Oil	65
Used Oil Filters	
Used Antifreeze	14
Batteries	53
Electronics	5
Inoperative Motor Vehicles	
Other Total (Specify Material and tonnage on Rows 24 - 39 to the right.)	
Total PRM in Tons	**5,108**

Specify Other PRMs for Row 39	
PRM Material	**Tons recycled**
Other Total	

MSW Disposed	
Household Waste	10,848
Commercial Waste	3,114
Institutional Waste	
Other	
Total MSW	**13,962**

Credit for Source Reduction Program	
SRP does not apply enter "0". SRP does apply enter "2"	
0%	

Enter facility information and material in columns A and B. Enter tons (whole numbers only) in the yellow highlighted boxes. Totals will auto calculate.

Credits Recycling Residue Facility/Operation	Material	Tons
Total		

Credits Solid Waste Reused Reuse Method	Material	Tons
Total		

Credits Non-MSW recycled Recycling Method	Material	Tons
Old concrete crushed as road base	C&D Concrete	300
King George Landfill alternative daily cover	Tire Chips	27,558
King George Landfill alternative daily cover	Glass	40,348
Total		68,206
CREDITS TOTAL		68,206

Recycling rates auto calculate.

Base Recycling Rate	**26.8%**
Adjusted Recycling Rate	**84.0%**
Adjusted Recycling Rate + SRP	**84.0%**
Credit Max Allowed Base +5	**31.8%**
Final Recycle Rate	**31.8%**

APPENDIX 5

COLLECTIONS

Appendix 5 Collections

5.1 County Collections

King George County offers trash collection and recycling at two county convenience centers located at the Sealston landfill and. Purkin's Corner. Convenience centers are only available to county residents and property owners.

Residents may also contract with private haulers for collection of domestic waste at their residence or may deliver their solid waste to the landfill themselves. Businesses and industries located in the County also may contract with a private hauler or deliver their solid waste to the landfill using their own equipment.

The Purkin's Corner convenience center is located on Henry Griffin Road, just off Route 205 near the King George Elementary School. Purkin's Corner Convenience center is open Monday through Saturday 6am to 6 pm and Sundays 10am to 2 pm.

The Sealston convenience center is adjacent to the County landfill at 10376 Bullock Drive. The Sealston convenience center is open every day 8 am to 6 pm.

The landfill is closed on July 4th, Thanksgiving Day, Christmas Eve - Noon closing, Christmas Day, New Year's Day, Martin Luther King, Jr. Day, Easter Sunday, Memorial Day, and Labor Day.

The County utilizes the services of Waste Management Inc. to operate collections from the County convenience center system. Operation of the convenience centers has been turned over to the County and plans for expansion of the convenience center system have been halted. Table 5 summarizes the goals and action items for the County's collection program.

Periodically, the County assesses the effectiveness of its collection system. This system is semi-privatized with the County providing operations for two convenience centers, and residents, businesses, and industries contracting directly with private collection companies. In reviewing the system the County may consider such items as:

- Budget
- Contracts
- Equipment Needs
- Personnel
- Effectiveness
- Aesthetics
- Complaints over previous year
- Traffic or entrance issues
- Safety
- Location of disposal facilities

This assessment is completed informally. If it appears that modifications to the system are needed, recommendations will be made to the governing body and action taken as necessary. Recommendations may include the following information:

- Description of change
- Background on need for change
- Evaluation of infrastructure needs
- Evaluation of potential contractual requirements
- Recommendations for method of implementation
- Schedule
- Regulatory requirements
- Costs and budget requirements
- Revenue sources to fund change.

TABLE 5

COLLECTION SYSTEM

GOALS AND ACTION ITEMS

Item Number	Goal	Action Item	Schedule	Estimated Costs
C-1	Continue to provide ease of service to its citizens.	Evaluate County Operation of Convenience Centers	As directed by the County BOS	Costs to be borne by landfill operator and Department of Public Works
C-2	Continue to provide access to a household hazardous waste disposal facility, and to provide a hazardous waste collection day to give residents an opportunity to safely dispose of their waste.	Continue the twice yearly HHW collection program, and expand as desired by the County BOS	As directed by the County BOS	Costs to be borne by landfill operator

If a change is implemented, the solid waste plan will be revised accordingly.

5.2 Collections at Dahlgren Naval Station

Collections at the Dahlgren Naval Station are divided into three categories, these being residential, industrial, and janitorial.

Residential: Each household is provided with an 18-gallon waste container in which everything is collected together, including waste and recyclables. The base contracts for waste collection, and a trailer is used for collection. The contractor segregates the recyclables from the waste stream and delivers the recyclable materials to a recycling facility. The waste is delivered to either the King George County landfill or another landfill located in Maryland. The disposal facility used is under the discretion of the contracted hauler.

Industrial: Industrial collection includes all but residential and janitorial collection. The base provides door-to-door collection from all of the office and operations buildings. Waste consists of office waste and discards from operations. Collections are conducted using a box truck with a rear lift gate. Two staff members are provided under a Memorandum of Agreement with the Morale, Welfare and Recreation Division of the Naval District in Washington, D.C. (Anocosta Annex) for industrial collection. Collection frequency varies depending on the quantity of materials generated. Some buildings are serviced frequently, some weekly, and others on call. Collections operations are available 5 days per week.

Janitorial: A separate contract with a private company is managed to collect residue and waste generated by janitorial activities at approximately 5 of the buildings at the Dahlgren Naval Station.

APPENDIX 6 A

DISPOSAL

Appendix 6 - Disposal (revised)

The only operating landfill in the planning region is the King George Sanitary Landfill and Recycling Facility, Permit Number 586. The landfill accepts municipal solid waste, wastewater treatment facility sludge, and construction/demolition/debris waste. The facility is owned by King George County and operated by Waste Management, Incorporated (WMI) under contract with King George County.

The County utilizes the disposal services of Waste Management Inc., under its landfill operations contract. It receives a host fee and other revenues for this operation, and does not pay a disposal fee. The County will continue to use this resource over the duration of the planning period.

The King George County Landfill and Recycling Facility is located at 10376 Bullock Drive, in King George County, Virginia 22485; approximately 1.5 miles North East from the intersection of Kings Highway (Route 3) and Birchwood Creek Road (State Road 665); approximately 0.5 miles North West from the intersection of Bullock Drive and Birchwood Creek Road (State Road 665); and approximately 10 miles East of Fredericksburg, Virginia. The site is accessible at the southern entry by paved Bullock Drive, as well as by the Dahlgren Branch of the CSX Railroad Line.

The facility is publicly owned by the County of King George, and privately operated by King George Landfill, Inc., and includes a sanitary landfill, convenience center, and rail car transfer station that receives waste from within, and outside of the Commonwealth of Virginia. Waste may be transported to the facility either by road or railway. The rail cars are specially designed and fully enclosed to eliminate odors or debris spillage. Until the cars are unloaded at the landfill, average laymen would not suspect them to be waste containers.

The total area of the facility is approximately 631 acres, which includes 378 acres within the facility boundary, and 291 acres within the disposal unit boundary. The landfill area is divided into 36 cells designed for Municipal Solid Waste (MSW) disposal. The design elevation of the King George Landfill is 375 feet (ft) above the mean sea level (msl).

A major amendment to the King George County Solid Waste Management Plan was triggered by an increase in capacity per 9VAC20-130-175.B.

The following key item makes the revised Plan a major amendment to the originally approved 2008 plan:

a. Increase in capacity of the King George Landfill SWP 586.
    - Permit modification for increase in capacity approved by DEQ on December 28, 2016.
    - Permitted capacity of the landfill under Permit Modification #15 is 67 million cubic yards. (Original permit included a permit capacity of 45 million cubic yards.)
    - Increased capacity created by increase in landfill height.

King George Landfill and Recycling Center reported in 2022 that the remaining capacity of the facility is 14,100,334 tons and a remaining permitted life of 18.7 years

Under the major modification #15 to SWP 586, approved by DEQ on December 28, 2016, the landfill permit indicated a remaining life of 28 years or through 2045. The 2023 DEQ annual report for this landfill indicates a remaining life of 18.7 years (from December 31, 2022) or through approximately 2041. The current planning period runs from 2023 through 2043 so the remaining life in the landfill as reported for calendar year 2022, will not meet the County's needs by the end of the period. Over the next 20 years, the County will be in discussions with Waste Management about possible expansions or alternative disposal options.

Table 6 summarizes the goals and action items for the County's disposal program.

TABLE 6
DISPOSAL SYSTEM - GOALS AND ACTION ITEMS

Item Number	Goal	Action Item	Schedule	Estimated Costs
D-1	Provide economical disposal capacity using a state-of-the art landfill facility	Continue to utilize the landfill operated by a supervised waste management operator	According to existing contract	Costs to be borne by landfill operator
D-2	Provide for revenue-generating disposal capacity well into the future	Expand landfill as needed to maintain disposal capacity	As desired and directed by County BOS	Costs to be borne by landfill operator
D-3	Provide environmentally secure disposal	Continue to monitor the facility operation via County staff	As directed by County BOS	Costs to be borne by landfill operator
D-4	Begin planning for future disposal capacity beyond 2041.	Evaluation of options; pay close attention to annual reports and capacity analyses.	As directed by County BOS	Cost distribution to be determined by option.

APPENDIX 6 B

SWP586 PERMIT INTRODUCTION 2016

COMMONWEALTH of VIRGINIA

DEPARTMENT OF ENVIRONMENTAL QUALITY
NORTHERN REGIONAL OFFICE
13901 Crown Court, Woodbridge, Virginia 22193
703-583-3800
www.deq.virginia.gov

Molly Joseph Ward
Secretary of Natural Resources

David K. Paylor
Director

Thomas A. Faha
Regional Director

SOLID WASTE FACILITY PERMIT
PERMIT NUMBER 586

Facility Name: King George County Landfill and Recycling Center

Facility Type: Sanitary Landfill **Latitude:** N 38° 16' 40"

Site Location: King George County, Virginia **Longitude:** W 77° 18' 47"

Location Description: The King George County Landfill and Recycling Facility is located at 10376 Bullock Drive, in King George County, Virginia 22485; approximately 1.5 miles North East from the intersection of Kings Highway (Route 3) and Birchwood Creek Road (State Road 665); approximately 0.5 miles North West from the intersection of Bullock Drive and Birchwood Creek Road (State Road 665); and approximately 10 miles East of Fredericksburg, Virginia. The site is accessible at the southern entry by paved Bullock Drive, as well as by the Dahlgren Branch of the CSX Railroad Line.

Background: The facility is publicly owned by the County of King George, and privately operated by King George Landfill, Inc., and includes a sanitary landfill, convenience center, and rail car transfer station that receives waste from within, and outside of the Commonwealth of Virginia. Waste may be transported to the facility either by road or railway. The wastes accepted include wastes listed in Module II, which is based on the information provided on DEQ Form SW PTB dated October 29, 2014, and special wastes indicated in Part B Application, Attachment XIII, dated October 29, 2014.

The total area of the facility is approximately 631 acres, which includes 378 acres within the facility boundary, and 291 acres within the disposal unit boundary. The landfill area is divided into 36 cells designed for Municipal Solid Waste (MSW) disposal, designated as follow: 1A, 1B, 1C, 2A, 2B, 2C, 3A, 3B, 4A, 4B, 4C, 5A, 5B, 6A, 6B, 7A, 7B, 8A, 8B, 9A, 9B, 10A, 10B, 11, 12, 13, 14A, 14B, 15, 16A, 16B, 17A, 17B, 18A, 18B, and 18C.

The design elevation of the King George Landfill is 375 feet (ft) above the mean sea level (msl). The total waste capacity of the landfill, as provided in the Design Report and Part B permit

application, is approximately 67 million cubic yards (yd^3). The landfill's daily maximum disposal limit is 10,000 tons per day, however, based on the projected average annual intake of 1,248,000 tons, and assuming the density of compacted waste is 0.90 tons per cubic yard, this information provides an estimated waste acceptance of approximately 4,000 tons per day. Using the assumed rate of 4,000 tons per day and assuming 307 days of operation in one year, the estimated site life is 28 years, or until 2045.

Permit Modification: This is the 15th permit modification to Solid Waste Permit Number 586 SWP586) which was originally issued on August 17, 1995. This major permit modification authorizes the owner and the operator to increase the final elevation of the landfill by 100 ft; from initially permitted 275 ft to 375 ft above msl and to increase the total landfill capacity by approximately 22 million yd^3; from initially permitted 45 million yd^3 to approximately 67 million yd^3.

In addition, this permit modification incorporates the following documents into the permit: Design Drawings, initially submitted in August 1994, last revised June 30, 2016; Design Report, initially submitted in August 1994, last revised June 23, 2016; Liquid Management System, initially submitted in August 1994, revised October 21, 2014; Construction Quality Assurance Plan and Technical Specifications, initially submitted January 2012, last revised June 23, 2016; Landfill Gas Management Plan, dated October 31, 2014; Landfill Gas Monitoring Plan, initially submitted in August 1994, last revised August 30, 2016; Odor Management Plan, initially submitted in August 2011, revised September 30, 2016; Groundwater Monitoring and Reporting Plan, initially submitted in March 2000, last revised August 30, 2016; Closure Plan, dated October 31, 2014, last revised February 25, 2016; and Post Closure Plan, dated October 31, 2014.

This permit modification also removes all references to the algae leachate treatment project, as the pilot project has been completed and the facility considers a future full scale algae leachate treatment program not feasible.

All previous permit modifications and variances are outlined in details in Module I, Section I.G., and previous approval letters are found in Permit Attachment I-1.

THIS IS TO CERTIFY THAT:

Owner	*Operator*
King George County	*King George Landfill, Inc.*
10459 Courthouse Drive, Suite 200	*10376 Bullock Drive*
King George, Virginia 22485	*King George, Virginia 22485*

is hereby granted a permit to construct, operate, and maintain the facility as described in the attached Permit Modules I, II, III, X, XI, XII, and XIII, and Permit Documents incorporated by reference. These Permit Modules and Permit Documents are as referenced hereinafter and are incorporated into and become a part of this permit.

The herein described activity is to be established, modified, constructed, installed, operated, used, maintained, and closed in accordance with the terms and conditions of this permit and the plans, specifications, and reports submitted and cited in the permit. The facility shall comply

with all regulations of the Virginia Waste Management Board. In accordance with Chapter 14, § 10.1 - 1408.1(D) of the Code of Virginia, prior to issuing this permit, any comments by the local government and general public have been investigated and evaluated and it has been determined that the facility poses no substantial present or potential danger to human health or the environment. The permit contains such conditions and requirements as are deemed necessary to comply with the requirements of the Virginia Code, the regulations of the Board, and to prevent substantial or present danger to human health or the environment.

Failure to comply with the terms and conditions of this permit shall constitute grounds for the revocation or suspension of this permit and for the initiation of necessary enforcement actions.

The permit is issued in accordance with the provisions of § 10.1-1408.1.A, Chapter 14, Title 10.1, Code of Virginia (1950) as amended. Variances that have been approved for this facility are included in Permit Attachment I-1.

Issued: August 17, 1995
Part A Approval: August 16, 1994

Modification 1:	November 6, 1995
Modification 2:	November 7, 1996
Modification 3:	April 21, 1997
Modification 4:	February 17, 1999
Modification 5:	April 20, 1999
Modification 6:	November 15, 1999
Modification 7:	October 30, 2002
Modification 8:	July 27, 2007
Modification 9:	January 17, 2008
Modification 10:	March 31, 2008
Modification 11:	July 14, 2008
Modification 12:	May 29, 2009
Modification 13:	July 12, 2012
Modification 14:	December 12, 2012

Variance 1:	August 17, 1995
Variance 2:	October 30, 2002

APPROVED: Thomas A. Faha

Thomas A. Faha
Regional Director

DATE: 12-28-16

Modified

PERMIT MODULES
REFERENCE LIST

PERMIT MODULE I – GENERAL PERMIT CONDITIONS
PERMIT ATTACHMENT I-1, PREVIOUS PERMIT APPROVAL LETTERS

PERMIT MODULE II – CONDITIONS OF OPERATION

PERMIT MODULE III – SANITARY LANDFILL DESIGN

PERMIT MODULE X – DETECTION MONITORING

PERMIT MODULE XI – ASSESSMENT MONITORING

PERMIT MODULE XII – CLOSURE

PERMIT MODULE XIII – POST CLOSURE CARE

PERMIT DOCUMENTS

The documents listed below are hereby incorporated into this permit and the permittee is subject to all conditions contained therein. It is the responsibility of the permittee to properly maintain and update these documents. Any version with a revision date other than as listed below is not considered to be the official approved version and is subject to Department review and approval prior to being recognized as the "permitted" version.

1. Part B Application:

1.a. *King George County Landfill and Recycling Facility, Solid Waste Permit Application, Part B Design Drawings, King George County, Virginia, August, 1994, Revised February, 1995, Revised for Major Permit Modification for the Vertical Expansion, October, 2014, Revised June, 2016*, prepared by Golder Associates, dated June 30, 2016.

1.b. *Closure Plan, King George County Sanitary Landfill & Recycling Facility, Vertical Expansion, Solid Waste Permit # 586*, prepared by Golder Associates, dated October 31, 2014, last revised February 25, 2016.

1.c. *Post-Closure Plan, King George County Sanitary Landfill & Recycling Facility, Vertical Expansion, Solid Waste Permit # 586*, prepared by Golder Associates, dated October 31, 2014.

1.d. *Design Report, King George County Sanitary Landfill & Recycling Facility, Vertical Expansion, Solid Waste Permit # 586*, prepared by Golder Associates, dated October 31, 2014, last revised June 23, 2016.

1.e. *Construction Quality Assurance Plan and Technical Specifications, King George County Landfill, SWP586, King George County, Virginia*, prepared by Golder Associates, dated October 31, 2014, last revised June 23, 2016.

1.f. *Liquid Management System*, prepared by Waste Management, dated October 21, 2014.

1.g. *Landfill Gas Management Plan, King George County Sanitary Landfill & Recycling Facility, Vertical Expansion, Solid Waste Permit # 586*, prepared by Golder Associates, dated October 31, 2014.

1.h. *Landfill Gas Monitoring Plan, King George County Landfill, Permit Number No. 586*, prepared by Golder Associates, initially submitted August 1994, last revised August 30, 2016.

1.i. *Odor Management Plan, King George Landfill, Inc., King George County, Virginia, Solid Waste Permit No. 586*, prepared by Waste Management, dated August 2011, last revised September 30, 2016.

1.j. *Groundwater Monitoring and Reporting Plan*, Revision 4.0, King George County Landfill, Permit No. 586. King George, Virginia, prepared by Golder Associates, Inc., dated March 2000, last revised August 30, 2015.

2. Other permit documents:

    2.a. *King George County Landfill, King George, Virginia, Revised Gas Collection and Control System Design Plan*, prepared for King George Landfill, Inc., by Carlson Environmental Consultants, dated June 2012, last revised April 17, 2013.

    2.b. *King George County Landfill & Recycling Facility, Part B Permit Application*, prepared by RUST Environmental and Infrastructure, dated August 1994.

3. The following documents have been submitted to satisfy permit or regulatory requirements; however, are considered reference documents and are not incorporated into SWP586. This list may not be all-inclusive:

    3.a. *Part A Permit Application, King George Sanitary Landfill*, prepared by SCS, dated March 1994.

    3.b. *King George County Landfill and Recycling Facility, Construction Certification for Cell 7A, Permit # 586, King George County, Virginia*, prepared for Waste Management, prepared by Draper Aden Associates, and dated October 30, 2015.

    3.c. *King George County Landfill and Recycling Facility, Construction Certification for Cell 6B & 1C, Permit # 586, King George County, Virginia*, prepared for Waste Management, prepared by Draper Aden Associates, and dated October 10, 2014.

    3.d. *King George Landfill and Recycling Facility, Construction Certification for Cell 6A/6B, Permit # 586, King George County, Virginia*, prepared for Waste Management, prepared by Draper Aden Associates, and dated December 18, 2013.

    3.e. *King George County Landfill and Recycling Facility, Construction Documents for 10-Acre Closure, Permit # 586, King George County, Virginia, July, 2013, Volume 1 of 1*, dated July 15, 2013.

    3.f. *King George Landfill and Recycling Facility, Construction Certification for Cell 1B, Permit # 586, King George County, Virginia*, prepared for Waste Management, prepared by Draper Aden Associates, and dated October 2012.

    3.g. *King George Landfill Incorporated, Air Permit #40903*, dated January 30, 2015, as amended.

    3.h. *King George Landfill, Virginia Pollutant Discharge Elimination System (VPDES) Industrial Stormwater General Permit #VAR051414*, dated August 12, 2014, as amended.

    3.i. *King George County Landfill, Registration for Aboveground Storage Tank (AST), FACID #3038249*, dated May 22, 2014.

APPENDIX 7

RECYCLING

Appendix 7 Recycling

7.1 County Recycling

King George County, like most areas, has both publicly and privately sponsored recycling programs operating within it. King George County currently owns two recycling facilities in the county, located at the old landfill facility at Purkins Corner, and the new landfill facility. These facilities were operated privately under the landfill operations contract but are being turned over for County operation. The recycling facilities currently accept the following materials:

- white goods,
- scrap metal,
- aluminum,
- glass containers,
- #1 and #2 plastics
- newspaper,
- batteries,
- anti-freeze,
- yard waste
- tires Sealston convenience center only

The recycling center, operated at the County landfill, is a joint venture between King George County and the landfill operations contractor. The County provides land at the landfill to operate the center and the operations contractor provides the day-to-day operations. In return for operating the program, the operations contractor keeps all revenue generated from the sale of collected materials. King George County also has an in-house recycling program. Currently office paper, newspaper, aluminum cans, and glass bottles are collected for recycling. Most of these materials are delivered to the landfill collection center for processing. Waste haulers offer recycling services to their customers with normal trash collection. Materials collected through this program are delivered to vendors for processing. Several of the local grocery and drug stores recycle cardboard boxes through in-house programs and car dealers and service stations recycle waste oil on a regular basis.

The County has a recycling program including two drop off centers, household hazardous waste collection days, yard waste mulching operations, coordinated by Waste Management Inc., under its landfill operations contract. Operation of the recycling centers has been turned over to the County and plans for expansion of the convenience center system have been halted. Table 7 summarizes the goals and action items for the County's recycling program.

TABLE 7
RECYCLING SYSTEM
GOALS AND ACTION ITEMS

Item Number	Goal	Action Item	Schedule	Estimated Costs
R-1	Provide for convenient opportunities for citizen recycling.	Evaluate County Operation of Convenience Centers	As directed by the County BOS	Costs to be borne by landfill operator and Department of Public Works
R-2	Track commercial recycling activities	Develop database for recycling by the commercial / industrial sector	As directed by the County BOS	Possible within County operating budget. Use existing staff
R-3	Recruit recycling companies as economic development	Encourage low impact recycling industries in conjunction with the landfill operation.	As directed by the County BOS	Possible within County operating budget. Use existing staff.
R-4	Educate and promote commercial and industrial recycling activities	Develop educational programs for the commercial / industrial sector and develop outreach program	As directed by the County BOS	Possible within County operating budget. Use existing staff
R-5	Educate the public on recycling and reuse activities. Encourage economically viable recycling of all materials in the solid waste disposal activity.	Continue to develop educational programs for the County's citizens	As directed by the County BOS	Possible within County operating budget. Use existing staff
R-6	Continue to beautify the County relative to illegal and roadside litter	Support and encourage roadside cleanup activities	As directed by the County BOS	Possible within County operating budget. Use existing staff
R-7	Continue to seek partnerships for recycling programs	Be opportunistic for private and commercial entities through economic development	As directed by the County BOS	Possible within County operating budget. Use existing staff

7.2 Industrial and Commercial

The County relies on the efforts of local businesses and industry to supplement member programs.

7.3 Recycling at the Dahlgren Naval Station

Recycling activities are conducted for both the residential and industrial sectors on the base. Programs for each consist of:

7.3.1 Residential: Recyclables are commingled with the refuse collected in 18-gallon containers from 250 household units at the base.

7.3.2 Industrial: The base provides door-to-door recycling at each of the office and operational buildings located on the base. Materials collected include:

- Paper products (office white and colored)
- Plastic bottles (nos. 1 & 2)
- Cardboard
- Aluminum cans are collected by the Boy Scouts
- Glass is currently not collected

Materials are collected using a box truck with a lift gate. Paper is placed in reusable plastic bags, colored paper in blue bags, and white paper in white bags. A local Boy Scout troop collects the aluminum cans. Cardboard is collected loose, although one building generates sufficient quantity that a tractor trailer is stationed at the building and it is switched out when full. Materials are consolidated at a warehouse on base and managed through a Memorandum of Agreement (MOA) with another governmental entity, the Morale, Welfare and Recreation (MWR) Department of the Naval District in Washington, D.C. Material brought to the warehouse is consolidated using a baler and forklift, but no additional sorting is done at the site. The MOA calls for the MWR to station two staff at the Dahlgren Naval Station for collections and operations at this facility, and the Dahlgren Naval Station pays their salaries. The base receives money for qualified Recycling Programs (QRPs) but none for non-qualifying recycling programs (Non-QRPs).

Reuse of office products, such as computers, desks, and chairs are encouraged through the Defense Revitalization program (DRMO), and these items are collected and transported to Richmond for resale.

Hazardous waste includes batteries, fluorescent light bulbs, used oil, oil filters, and antifreeze. Lead acid batteries are taken to Richmond where Richmond Interstate Recycling recycles them. Used oil is taken to Rollins Recycling in Hopewell, and discarded computers are managed by the DRMO. Fluorescent light bulbs are recycled at a plant in West Virginia.

APPENDIX 8 A

ANNUAL BUDGET EXCERPTS
FY 2022-2023

Appendix 8 (Revised 3/15/24)

Source of Information: County or King George County Comprehensive Annual Financial Report (CAFR) FY 2023

Waste Management, Incorporated operates a landfill in the County that accepts waste from Virginia and states north of the Commonwealth. The County initially received $5 for every ton of waste accepted at the facility. With the approval of the landfill expansion in 2016 by DEQ, the County will receive an additional $1 for every ton received once the landfill operation begins to use the expansion capacity.

Total revenues from host fees from the landfill for FY 2023 as reported in the ACFR (Page 159) were $4.6 million. Landfill revenues are an important source of funds for the County. This source of funds has afforded the County the opportunity to upgrade and expand facilities while retaining a lower real estate rate.

"As of Fiscal Year 2023, the County has received $3.0 million dollars, which was paid over a six-year period for the expansion. In addition, the County will receive a one dollar per ton increase in the host fee commencing when disposal operations start in the expansion area." (CAFR page 11)

Landfill fees collected in fiscal year 2023 totaled $4.6 million from host fees and $0.5 million from fees for the expansion. (CAFR page 159)

The County maintains a contract with an independent contractor for operations of the landfills. The County collects tipping fees based upon the source of the waste. The contractor is responsible for any landfill closure and post closure costs. As of June 30, 2023 the County has set aside escrow funds in the amount of $4,351,844 to cover potential liabilities related to any landfill closure and post closure costs which may result from the contractor's ineligibility to cover such costs. These funds are reported as an agency fund in the landfill escrow fund. After the landfill has been closed for 15 years 50% of the fund and interest earned thereon may be paid to the contractor provided there has not been a material claim against the County. All unexpended funds will be paid to the Contractor 30 years after the final closure of the facility.

The final budget summary for FY 2023 as provided by the County was as follows:

	Original Budget:	**Final Budget:**	**Actual:**	**Variance from Final Budget**
Sanitation and waste removal: Landfill (CAFR page 124)	$470,681	$480,771	$418,708	$62,063
Environmental management: Litter control	$4,350	$11,117	$11,117	$-
Capital Projects Fund: Revenue from local sources: Permits, privilege fees and regulatory licenses:				
Landfill host fees (CAFR page 159)	$7,351,000	$7,351,000	$4,600,523	$(2,750,477)
Landfill fees - expansion	$500,000	$500,000	$500,000	$-
Landfill fees - beneficial use				
Total permits, privilege fees and regulatory licenses	$7,851,000	$7,851,000	$5,100,523	$(2,750,477)

For FY 2023, full time county government employees for Public Works as reported in the ACFR (Page 182) was as follows:

Function	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**
General maintenance	11	13	15	16	16	17	17	17	17	15
Landfill	3	3	3	3	3	5	5	5	7	8
Engineering	2	2	1	1	1	1	1	1	2	2

APPENDIX 8 B

ANNUAL BUDGET SOLID WASTE AND LITTER CONTROL
FY 2022-2023

DEPARTMENT OF SOLID WASTE AND RECYCLING

DESCRIPTION

The mission of the Department of Solid Waste and Recycling is to provide professional contract administration relating to the Landfill Agreement between the County and Waste Management. This includes the Landfill and Litter Control Programs. The primary functions of the Department include daily monitoring of landfill activities being performed by Waste Management, and monitoring Waste Management's compliance with the Virginia Department of Environmental Quality and US Environmental Protection Agency requirements. In addition, the Department monitors the landfill gas collection system (for odor control), roadside litter, and the convenience center locations.

The litter control program is highlighted is a separate section.

STRATIGIC GOALS/OBJECTIVES

- Monitor Waste Management's construction activities
- Monitor Waste Management's litter pickup program
- Provide opportunities for the development and growth of staff
- Monitor local, state and federal regulatory issues
- Monitor gas collection and odor control systems; perform off-site odor tests
- Perform random inspections of trash and trash vehicles
- Monitor condition and operation of convenience center sites
- Establish a recycling program at local schools and businesses

BUDGET SUMMARY

	ACTUAL FY/2021	ACTUAL FY/2022	ACTUAL FY/2023	AMENDED FY/2024	ADOPTED FY/2024	% CHANGE FROM FY24 AMENDED VS ADOPTED	% CHANGE FROM FY23 ACTUAL VS ADOPTED
Personnel	$287,509	$318,,980	$595544	$702,837	$678,045	-4%	14%
Operating	$21,548	$42,290	$185,920	$310,935	$306,483	-1%	65%
Capital						0%	0%
TOTAL	**$309,057**	**$361,270**	**$781,464**	**$1,013,772**	**$984,528**	**-3%**	**26%**
Full Time Staff	5	7	8	8	8		

SERVICE LEVELS AND PERFORMANCE

N/A

FUTURE YEAR ISSUES

- Monitor capacity of landfill and future usage as current data projects closure as of 2041.

LITTER CONTROL

DESCRIPTION

The litter control budget is grant funded, from the Virginia Department of Environmental Quality. The Department of Solid Waste and Recycling applies for this grant on an annual basis. This budget supplies money to the Solid Waste and Recycling Department to perform recycling and litter cleanup and prevention projects. Funds cover the employee hours required to supervise individuals performing community service. Additionally, equipment necessary for recycling, and litter pickup activities is purchased with this budget.

SERVICE LEVELS AND PERFORMANCE

	CY2022 Actual	CY2023 Actual	CY2024 Planned
No. of Program Clean-up Events	2	2	2
Total Participation in Clean-up Events	30	30	30
No. of Youth Group Presentations/Workshops	1	1	1
Total Participants in Youth Group Activities	35	60	40
Household Hazardous Waste Days	2	2	2

FUTURE YEAR ISSUES

- Encourage enforcement of anti-litter laws, improve recycling efficiency and continue to participate in volunteer clean-up events.

APPENDIX 9-A

2004 PUBLIC HEARING ADVERTISEMENT

King George County
Notice of Public Hearing
Solid Waste Management Plan

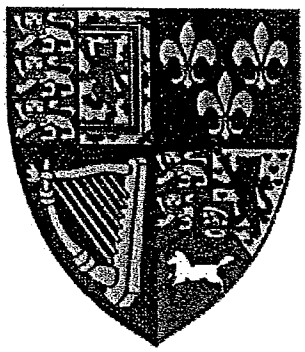
Pursuant to the requirements of 9 VAC 20-130-110B of the Virginia solid Waste Management Regulations, the King George County Board of Supervisors will hold a public hearing to discuss the proposed County Solid Waste Management Plan. The plan, by regulation, must address collection, disposal and recycling for a 20-year period, through 2024. The purpose of the public hearing is to acquaint the public with the proposed plan. The meeting will allow the public an opportunity to comment on the plan and to provide suggestions relative to the County's integrated solid waste management system. Suggestions and comments will then be evaluated by the County and incorporated into the final plan if found to be in the best interest of the County.

The public hearing will be held on Tuesday, September 21, 2004, at 6:45 p.m. at the Revercomb Administration Building, Robert H. Combs Board Room, 10459 Courthouse Drive, King George, VA 22485. A copy of the plan is available for public review at the County Administrator's office, (540) 775-9181, 10459 Courthouse Drive, Suite 200, King George, VA 22485, Monday through Friday, 8:30 a.m. to 4:30 p.m. Comments on the Solid Waste Management Plan will be accepted until 2:00 p.m. on Tuesday, September 21, 2004.

By Order of
The Board of
Supervisors
King George County, Virginia

King George County, Virginia

10459 Courthouse Drive, Suite 200
King George, VA 22485
Telephone: (540) 775-3321
Fax: (540) 775-3706
Email: jpauley.kg@wans.net



Jason M. Pauley
Director
Solid Waste & Recycling Dept.

King George County Board of Supervisors held a public hearing on September 21, 2004 for the adoption of the revised county Solid Waste Management Plan. During this hearing, there were no public comments received. Additionally, no written comments were received.

Jason M. Pauley
Director

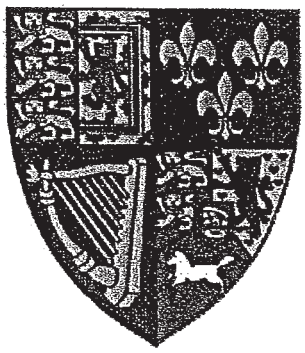
9/22/2004
Date

APPENDIX 9-B

2004 RESULTS OF PUBLIC PARTICIPATION

King George County, Virginia

10459 Courthouse Drive, Suite 200
King George, VA 22485
Telephone: (540) 775-3321
Fax: (540) 775-3706
Email: jpauley.kg@wans.net



Jason M. Pauley
Director
Solid Waste & Recycling Dept.

King George County Board of Supervisors held a public hearing on September 21, 2004 for the adoption of the revised county Solid Waste Management Plan. During this hearing, there were no public comments received. Additionally, no written comments were received.

Jason M. Pauley
Director

9/22/2004
Date

APPENDIX 10

2004 ADOPTING RESOLUTION

King George County, Virginia

COUNTY ADMINISTRATOR
DENNIS W. KERNS
10459 Courthouse Drive, Suite 200
King George, Va. 22485
Telephone: (540) 775-9181
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The following is a certified and true excerpt from the meeting held by the King George County Board of Supervisors on Tuesday, September 21, 2004:

On a motion by Mr. Wolfe, seconded by Mr. Brooks, and carried unanimously, each Board member voting as follows -- Mr. Brooks Aye; Mr. Howard Aye; Mr. Sisson Aye; Mr. Wolfe Aye; and Mr. Grzeika Aye, the Board of Supervisors adopted King George County's Solid Waste Management Plan as submitted.

Dennis W. Kerns
Clerk to the Board of Supervisors

APPENDIX 11 - DELETED

2015 KING GEORGE SWMP MINOR AMENDMENT

APPENDIX 12 - PENDING

2023/2024 SWMP MAJOR AMENDMENT DOCUMENTATION