

**Rappahannock Regional  
Solid Waste Management Board**

**SOLID WASTE MANAGEMENT PLAN UPDATE**

**County of Stafford and  
City of Fredericksburg, Virginia**

**February, 2005**

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## **1.0 INTRODUCTION**

This Solid Waste Management Plan (SWMP) has been prepared for the Rappahannock Regional Solid Waste Management Board (R-Board) for the comprehensive planning of solid waste management in the R-Board service area which includes the City of Fredericksburg and the County of Stafford (see figures in Appendix A). The R-Board was officially designated as a regional solid waste management planning area on February 21, 1991, by then Director of the Department of Waste Management - Cynthia V. Bailey.

### **1.1 R-Board Composition**

The R-Board consists of the following individuals:

- two elected officials from each jurisdiction,
- the City Manager,
- the County Administrator, and
- the Solid Waste Director

Other participants include the R-Board Landfill Operator, the R-Board Recycling Coordinator, the R-Board Clerk, Attorney and Consultant Engineer.

### **1.2 Goals and Objectives**

The goal of the SWMP is to effectively plan for the management of solid waste through a process that considers various solid waste management components including generation, collection, disposal, recycling, financing, and facilities, within the overall framework of the solid waste management hierarchy.

The goals and objectives of the SWMP will be realized through the implementation of the various programs authorized and managed by the R-Board.

## **2.0 WASTE QUANTITIES AND PROJECTIONS**

The following data has been used to account for the projection of solid waste generated within the service area and requiring some form of management. The R-Board landfill receives solid waste only from the service area jurisdictions.

### **2.1 Description of Plan Area**

Stafford County continues a general east to west transition from a rural-suburban area to a more diversified commercial, industrial, and suburban area, as population growth and economic development impacts are realized. Growth continues to be fueled by the outward expansion of the Washington, DC, zone of influence. Improved rail and highway access to DC from Stafford allows for an easier commute. Approximately 25 percent of Stafford residents work within the county.

In 1999, Fredericksburg published an update to the City's Comprehensive Plan which fully describes the current and expected demographics of the city. According to the Comprehensive Plan, Fredericksburg, because of its more fully developed status, is expected to change at a slower rate than Stafford, and retain a more constant land use pattern.

### **2.2 Population Data and Projections**

No major differences in demographics have occurred or are expected to occur compared to the original SWMP of 1991. According to the Stafford County Planning Department, the County is expected to grow at a slightly reduced rate than was projected in 1991. The following population projections are from the Stafford County Comprehensive Land Use Plan:

<u>Year</u>	<u>Population</u>
2005	100,000
2010	120,180
2020	144,216

According to the City Planning Department, Fredericksburg population is now projected to grow at nearly the same rate as previously predicted. The City population data and projections are as follows:

<u>Year</u>	<u>Population</u>
2004	21,100
2010	23,687
2020	26,687

Because the waste generation projections are based primarily upon the application of a per capita waste rate to the service area population, the increased population projections may have an impact on the R-Board solid waste generation projections, and subsequently the R-Board site life projections. The updated population estimates are factored into the waste generation projections and site life estimates reported herein.

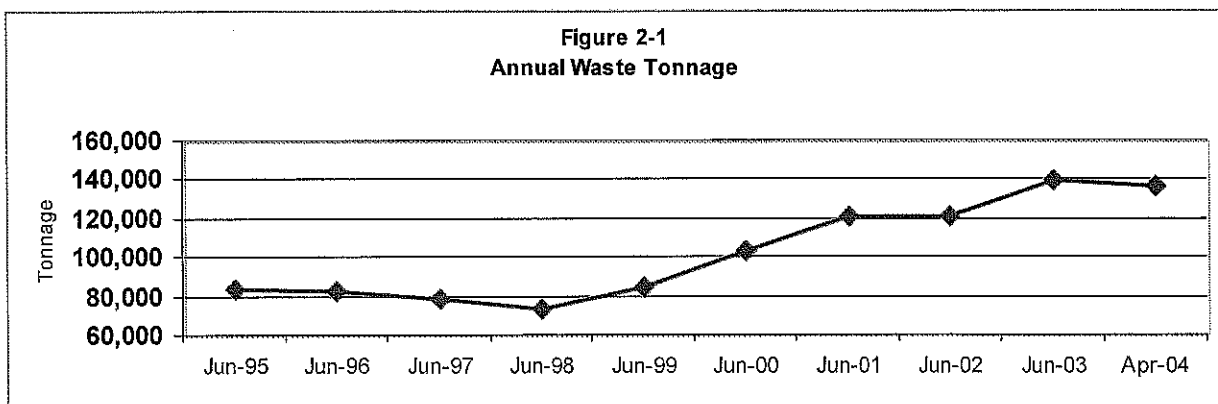
### 2.3 Composition of Solid Waste

The composition of the waste stream in the plan area is a typical mix of municipal solid waste and construction demolition debris. The residential and commercial development that continues to occur throughout the region provides for a normal mix of residential and commercial solid wastes. The service area includes one hospital as well as portions of a military installation. These types of waste generators may sporadically provide site-specific institutional wastes, but the waste records at the R-Board Landfill do not indicate a significant amount of these materials. Private haulers bring commercial waste from offices, retail outlets, government facilities, schools, restaurants, and other businesses.

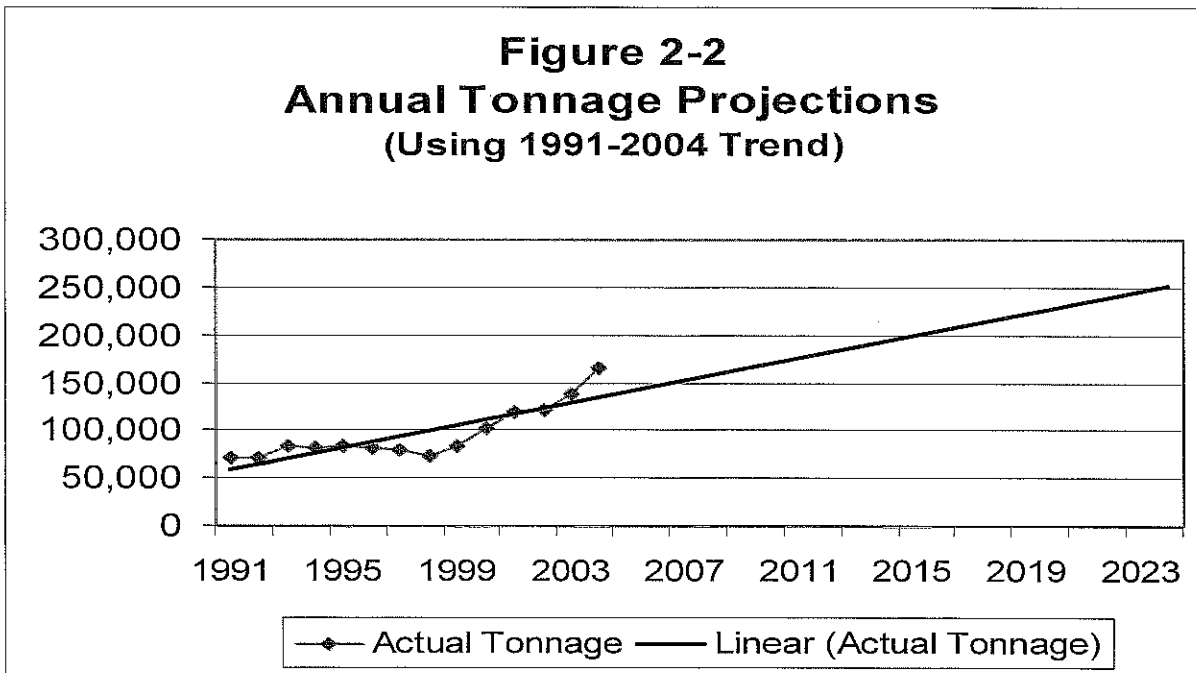
Waste stream characterizations were performed in 1990, 1992 and 1993. In the 1993 study, three categories of residential vehicles were included: automobiles; mini-trucks; and full size pickups. These vehicles were randomly selected as they entered the facility, and their waste composition assessed. One hundred vehicles from each category were selected. Additionally, two commercial rear compactor trucks were sampled. Recyclable categories recovered from the sampled vehicles included paper, plastic, glass, aluminum, and tin/bimetal.

### 2.4 Solid Waste Generation Projections

Waste quantities at the R-Board Landfill have increased dramatically over the last five years. Previously, the facility had been landfilling approximately 80,000 tons of solid waste per year. Over the last three years the average annual tonnage rate has increased to over 125,000 tons. Figure 2-1 below indicates the trends since 1995.



Annual MSW generation is projected to grow from approximately 87,000 tons in 1999 to over 160,000 tons by 2010. Figure 2-2 indicates the projection of annual waste quantities into the future based upon the disposal trend between 1991 and 2004.



Based upon the current permitted capacity of Cells A through D, future Cell E and the planned capacity of the Phase II expansion area, and assuming waste quantity projections as indicated in Figure 2-2, the useful life of the R-Board landfill is projected beyond 2036. As mentioned previously, additional expansion areas are planned beyond Phase II which will increase the useful life of the facility.

Several factors may affect these projections. Population growth and the competitive relationship with the private King George landfill are likely the most significant factors. Technological trends may also play a role in waste generation rates. Trends toward less bulky packaging, reusable containers, home composting, yard waste collection, and the increased recyclable nature of products may eventually reduce the per capita waste generation.

The current annual tonnage rate translates to an average per capita per day disposal rate of 5.2 pounds. The most recent EPA Study (2001) conducted by Franklin Associates indicates a national disposal rate of 4.4 pounds per capita per day.

### **3.0 SOLID WASTE MANAGEMENT SYSTEM**

The current solid waste management system is described herein. The technical data that has been used to identify milestone indicators is included within this section and within the various appendices.

#### **3.1 Collection**

The City provides municipal residential collection and hauling service. Stafford County relies on private hauler collection of solid waste, and a significant percentage of Stafford County residents also take advantage of the residential drop-off facility adjacent to the landfill to dispose of their solid waste.

BFI Waste Services, LLC operates a solid waste management facility within Fredericksburg known as the Recyclery™ which has been designed as a central delivery point for non-hazardous, non-liquid solid waste, debris and recyclables. The facility provides a comprehensive solid waste management service combining recycling, resource recovery, processing, and transfer and marketing procedures, and is conducted in an environmentally safe manner. The facility has the capacity to manage in excess of 1,000 tons of solid waste and recyclables per day.

#### **3.2 Disposal**

The R-Board Landfill property includes approximately 730 acres. Two major disposal areas exist within the R-Board Landfill site. The figures within Appendix A include a regional map, service area map, a site location map and a master plan of development for the facility. Old disposal area 74 (formerly Permit No. 74) is an unlined disposal area that operated as Permit No. 74 from 1972 through 2001 when it was closed. It is currently in post-closure status and has been merged into the primary permit for the site which is Permit No. 589.

Prior to the merger with old Permit No. 74, the Permit No. 589 area represented the portion of the site that had been permitted and designed in accordance with the Solid Waste Management Regulations that were enacted in 1988 and all subsequent amendments. The area included disposal cells A, B, C, and D. Cells A and B were permitted prior to the existence of federal Subtitle-D sanitary landfill standards and therefore do not have composite liners, although they do have clay liners and leachate collection and removal systems. Cells C and D are Subtitle-D disposal cells.

##### **3.2.1 Current Operations**

The current disposal operations at the facility are within Cells B, C, and D. Adjacent to Cell D (to the east) will be Cell E which is being permitted through the major permit amendment process at this time and should be permitted and constructed within the next year.

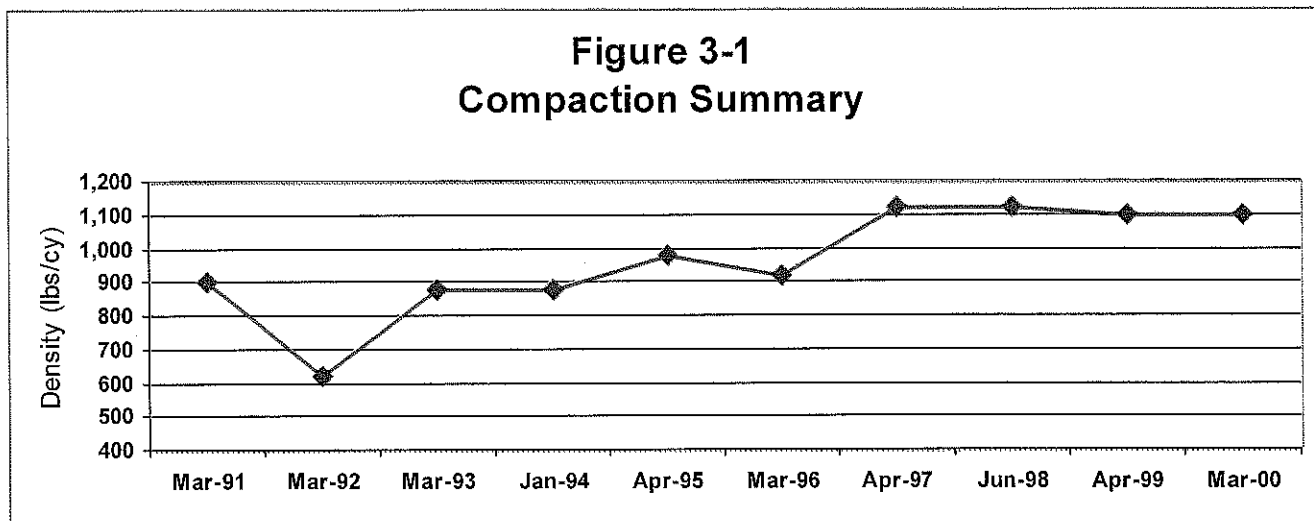


Volume consumption studies have been provided as an operational monitoring tool to the R-Board periodically since 1990. A summary of the studies performed is provided herein for historical comparison.

Data is provided to estimate:

- the rate of landfill volume consumption, and
- the in-place density of the waste within the landfill expressed in tons per cubic yard (tons/cy).

The results of these reports as shown in Figure 3-1 indicate a pattern of increasing densities through the 90's until reaching a relatively consistent waste density of between 1,000 and 1,100 pounds per cubic yard (0.50 to 0.55 tons per cubic yard). This value has been used for future site life projections.



### 3.2.2 Future Operations

A proposed expansion area (Phase II) of approximately 80 acres is currently being permitted through the VDEQ's Part A and B permitting process. The planned progression of the site will be from the new Cell E area into the proposed Phase II expansion area which is to the east and north of Cell E. Preliminary estimates within the Phase II expansion area indicate the potential for approximately 11,000,000 cubic yards of disposal airspace.

Solid waste management and disposal is planned to occur at the site over the next 20(+) years into the future with the entire site being permitted for disposal to its fullest extent. After the current proposed expansion area is filled, another expansion area (Phase III) within the site will be identified and permitted through the VDEQ's Part A and B process.

### **3.3 Recycling**

Since 1990, the R-Board has maintained a comprehensive recycling program to meet State-mandated recycling rates. The rates mandate that localities recycle 25% of their household and business-generated waste annually. In recent years the R-Board has reported meeting the State-recycling rate, having reported a recycling rate for 2003 at 27.5 percent.

Several updates to both the methods of operating and collection have been made to the recycling program to meet with changing emphasis on which materials to recycle as well as end-user collection methodology.

Virginia House Bill HB-1743, passed in the 1988-89 General Assembly session required that all jurisdictions recycle 25 percent of their waste stream by 1995. The Virginia Solid Waste Management Plan Regulations (9-VAC-20-130-120) enforce this law.

Subsequent legislation was enacted to require all solid waste generators and waste management companies to submit operating reports documenting waste quantities and recycling efforts annually. A statute now exists that enables localities to adopt and enforce ordinance requiring local businesses to separate and collect recyclables and to recycle certain materials.

Recycling efforts in the R-Board service area may be divided into several broad categories, as follows:

- (1) Collection of Recyclables at the landfill;
- (2) Collection of Recyclables from Remote Drop-offs;
- (3) Curbside Collection (City and Private Haulers);
- (4) Coordination with Private Recycling Efforts;
- (5) Yard Wastes; and
- (6) Special Wastes

The City and County have designated the R-Board as the reporting entity for their regional recycling program. Recycling activities by the City, County, and R-Board are funded by tipping fees at the landfill as well as from the sale of recycled materials.

### **3.3.1 Collection of Recyclables at the Landfill**

The R-Board collects recyclables at the landfill, at 489 Eskimo Hill Road, by two methods. The first is through individual delivery at the facility's residential drop-off area. The landfill drop-off facility is open from 8:00 a.m. to 5:00 p.m. weekdays, Saturday's 8:00 a.m. to 4:00 p.m., and Sunday 8:00 a.m. to 3:00 p.m. Many new items and services have been added to this collection area in recent years. A grid showing the items available for recycling is included in Appendix B.

The second is through commercial hauler drop-off. For mixed container loads (plastics, all grades; glass, all colors; steel; aluminum) a loading dock was built from which haulers unload their materials into 40 cubic yard roll-off containers. The buyer then uses the same dock area from which the landfill staff unloads 2-3 of these containers into an open top dump trailer for transport.

The cardboard and newspaper/magazine mix are received in the baler warehouse on the tip floor. These products are processed separately. The newspaper is cleaned and loaded loose to 40 cubic yard containers, which are the property of and transported by the buyer. The cardboard is baled and loaded onto a truck for transport to end market. A grid showing the markets used for recycling is included in Appendix B.

Residents, commercial haulers, and the City brought into the landfill a total of 17,627 tons of recyclables in calendar year 2003. A graph entitled "Eskimo Hill Road Recycling" is included in Appendix B that indicates the consistent progress made in the collection of recyclables at the landfill over the past three years.

### **3.3.2 Mobile Drop-off Sites**

Stafford County operates 5 mobile drop-off sites in the County at Hartwood, Rock Hill, North Stafford High School, Widewater and White Oak. A sixth site is located in the City of Fredericksburg on Belman Road. The R-Board continues to examine and evaluate such sites. The locations and hours of operation for these sites are listed in the brochure cover included in Appendix B. A map entitled "Stafford County Drop Off Sites" is also included in Appendix B for a service area perspective. The drop-off locations are not staffed, but include instructional signage for residents. The R-Board receives, processes, and markets the materials.

The City of Fredericksburg's Department of Public Works operates a recycling center at 1200 Belman Road which is open weekdays from 4:00 p.m. to 8:00 p.m. It is open weekends and holidays 10:00 a.m. to 4:00 p.m. Winter hours are: 4:00 p.m. to 6:00 p.m. Monday to Friday; noon – 4:00 p.m. weekends and holidays.

### **3.3.3 Curbside Collection**

The City of Fredericksburg's Department of Public Works operates the City solid waste collection service. Residential waste collections are made twice weekly at curbside. Aside from solid waste, each household is offered one 30-gallon recyclables bin. A City recycling truck collects recyclables from the bins once per week. The recyclables are taken to the landfill's commercial drop-off site. City waste collection costs are charged to the residents as part of their water bills. The City offers curbside collection of recyclables for a nominal additional fee. The City also provides at no charge cardboard recycling collection for downtown merchants.

The County of Stafford does not provide trash collection service. The County depends on private haulers to contract directly with residents. The private haulers offer varying recycling services to their clients, with a wide range of effectiveness. Each hauler that brings waste to the landfill can save tipping fees by placing the recyclables into the recycling collection system at no charge before being weighed. Public awareness, demand and tipping fee savings are the primary incentives for private haulers to offer recycling services within the R-Board service area. A grid indicating the current haulers in the Stafford area and the services they provide is included in Appendix B.

### **3.3.4 Private Recycling Efforts**

The R-Board, City and County encourage private citizens and companies to recycle. Independent recycling efforts are undertaken by area educational facilities as well as larger businesses.

Most commercial recycling is handled privately for final disposition. Businesses are asked to respond to commercial recycling audits performed by the R-Board on an annual basis. A total of 22,594 tons of recyclables was reported for the 2003 calendar year. The R-Board Recycling Coordinator recently met with the VDEQ Regional Hazardous Waste compliance representative in an effort to more effectively educate commercial businesses in this area of solid waste management. An insert on the subject will be included in the upcoming commercial recycling audit mailing.

The BFI Waste Services LLC Recyclery™ provides a private alternative for significant solid waste management and disposal capacity within the region. The facility has the capacity to manage in excess of 1,000 tons of solid waste and recyclables per day. Non-hazardous solid waste and recyclables (source separated and commingled) is delivered to the facility by haulers.

All incoming loads are inspected by employees trained to recognize unacceptable materials. After passing over computer scales, vehicles proceed to a tipping area for off-loading onto a concrete or asphalt pad. The empty vehicle will then exit the tipping area and will either be re-weighed or allowed to exit the site (if empty weight information for vehicle is on file).

Through manual and/or mechanical processes, various recyclable materials will be extracted from the waste. The following recyclable materials may be extracted:

- Mixed paper
- Commingled recyclables (cans, glass bottles and jars, #1 and #2 plastic containers)
- Scrap metal
- Concrete
- Dirt

Within the region there are also four scrap metal buy back centers, three in the County of Stafford and one in the City: Northern Virginia Metal in central Stafford, M & C Metal in southern Stafford, and Summitt Recycling in the City.

### **3.3.5 Yard Waste**

The R-Board landfill accepts yard waste (brush, leaves, clippings, etc.) from private residents. The landfill operates a tub grinder to grind yard waste into mulch.

The chipped yard waste is stockpiled at the landfill, and is offered free to residents. Currently, all yard waste is fully utilized each season, so that there is no carry over from year to year. The citizen's must load and haul away the mulch independently.

The R-Board landfill accepts Christmas trees, which it grinds. The Soil and Water Conservation District, in conjunction with Stafford County, promotes tree recycling and typically offers promotional gifts to those who bring in their trees.

The City operates leaf collection services seasonally. Currently the City sends leaves to the R-Board landfill, which uses them as an additive to form a beneficial cover material.

### **3.3.6 Special Wastes**

In recent years the R-Board has committed itself to increasing services in the area of special wastes. They are now collecting electronics for recycling at both the Eskimo Hill and Belman Road residential recycling areas year around. They collect batteries (proceeds benefit the local Pet Assistance League) and cell phones (proceeds benefit the local Domestic Violence Program).

The R-Board hosts a total of four Household Hazardous Waste days annually. These events are conducted in both the City and County and residents from both areas are encouraged to participate.

### **3.3.7 Comprehensive Awareness Plan for Recycling**

The R-Board focuses on two major components relative to awareness planning for recycling - advertising and education. The advertising section includes a variety of tools used year around to promote different aspects of recycling. Some examples are: PSA's, websites (over 46,000 specific hits in 2002), a permanent two-sided message board at the landfill, billboard advertising, radio ads, and newspaper inserts. The R-Board proactively seeks opportunities to conduct interviews and prepare feature articles whenever possible.

Mainly volunteers perform the education component. The program has in inventory a variety of education presentations for all age groups. This year volunteers have added a mobile education trailer to the program. In 2003, 143,952 pieces of informational materials were distributed. Presentations were made to over 3,600 residents and hundreds of hours were donated toward this goal.

### **3.4 Public Education**

The R-Board maintains a comprehensive year around education and advertising program for all ages. Presentations and displays specifically addressing the subject of source reduction are utilized in the education outreach programs. These programs are coordinated and maintained by a recycling and litter prevention technician whose primary focus is to educate and advertise in this area. Tools that are distributed at programs to promote such reduction of waste include sponges, mugs, and cloth shopping bags.

Reuse is also targeted in many displays and ads encouraging residents to think about their purchasing habits and various ways to reuse things they've purchased. The R-Board also has a large reuse/donation database that is sorted by item and where in the region items may be donated. This database is available via e-mail, a link from our website, or by U. S. Mail.

The R-Board also conducts household hazardous waste collection days and sponsors Earth Day public education displays on an annual basis to promote continued education with respect to responsible solid waste management.

A very successful R-Board effort is conducted through the local public school system. Informational flyers are routinely distributed through the elementary school population. Displays as well as presentations are done at all levels. High School "Learn and Serve" students have set up their own recycling collection programs. The High School "Learn and Serve" program has also proven to be a source of assistance for any new or special project in recycling.

### **3.5 Public/Private Partnerships**

Examples of current successful partnerships include the regional Public Schools' recycling programs and R-Board sponsored "Community Pride" cleanup programs, which are scheduled twice each year encouraging community involvement with waste management and litter control. Also, cooperative arrangements with the Regional Jail for inmate labor assistance with litter control along U.S. Route 1 have been initiated.

## **4.0 WASTE MANAGEMENT HIERARCHY**

The R-Board has continued to monitor and evaluate its programs and activities on the basis of the solid waste management hierarchy as defined by the regulations in the order of preferred management technique:

- Source reduction
- Reuse
- Recycling
- Waste-to-Energy/Incineration
- Landfill

### **4.1 Source Reduction**

Source reduction is included in the educational programs that have been introduced within the region's public schools through programs like "litterless lunch" that discourage the use of disposable packaging by promoting the use of reusable containers for the students' lunches.

Similarly, the Recycling Coordinator's Office recently hired an education technician and met with staff from our Regional DEQ Office to come up with a plan to address our area businesses handling of wastes. We have sent out a package promoting the "Business by the Bay" and "Waste Wise" programs to our commercial sectors. The packages were included with our recycling audit request. This has already generated calls and requests for assistance from businesses. We are planning to conduct similar outreach and are targeting specific types of businesses throughout the year.

### **4.2 Reuse**

The current landfill operation has been expanded recently to actively reclaim certain reusable materials from the working face. Wood, gypsum board, and other construction related materials are typically set aside for collection in a reuse area that local residents are allowed to browse. Cardboard is also reclaimed from the working face and collected at the baler building for additional processing.

### **4.3 Recycling**

Recycling continues to receive funding and support from the R-Board through the position of Recycling Coordinator. The Coordinator is responsible for collecting all recycling statistics and managing the recycling programs of the R-Board and for the County. The City also provides recycling support to the R-Board through their Department of Public Works. The efforts of these



two offices have enabled the recycling program of the R-Board to expand into the additional areas mentioned previously such as electronics recycling and household hazardous waste collection days.

#### **4.4 Waste-to-Energy**

Waste-to-Energy has been studied frequently over the past several years focusing on microturbine technology, landfill gas-to-energy peaking plants, and standard landfill gas-to-energy electrical generation facilities. Recently, the R-Board has initiated discussions with an electrical generation firm that will result in a proposal for installation of a landfill gas-to-energy facility at the R-Board Landfill. The potential exists for the R-Board Landfill's collected landfill gas to be used for the generation of enough electricity to power as many as 4,000 homes in the region.

#### **4.5 Landfill**

Due to the abundance of useable land at the R-Board's landfill site, landfilling will continue to be the primary means of solid waste management within the region for the foreseeable future. The R-Board will continue as described herein to explore additional means of applicability to the other components of the waste management hierarchy such as the proposed landfill gas-to-energy facility.

## **5.0 IMPLEMENTATION PLAN**

The R-Board has consistently strived to expand their solid waste management activities with respect to integrated waste management strategies within the region. The R-Board has worked cooperatively and regionally to accomplish many solid waste management objectives over the years in these areas.

### **5.1 Source Reduction**

Bulky materials are routinely removed for special handling. Wood wastes are set aside for source reduction through use of the facility's tub grinder.

### **5.2 Reuse**

The landfill operator will continue to expand the working face reclamation program. An organized reuse area will be maintained for residential use.

### **5.3 Recycling**

Recycling continues to receive funding and support from the R-Board through the position of Recycling Coordinator. The Coordinator is responsible for collecting all recycling statistics and managing the recycling programs of the R-Board and for the County.

A recycling loading dock to improve recyclable collection and transfer efficiency and modified residential recycling roll-off containers to reduce contamination are other examples of strategies that have been implemented by the R-Board in the last several years.

One of the more interesting procedures put in place by the Landfill Operator is the reclamation of recyclable cardboard from the landfill working face. Early figures indicate the potential to increase the cardboard recycling volume by approximately 25%.

The overall program has added many new recyclables since 2000. Phonebooks, magazines and catalogs, electronics, cell phones, household batteries, mercury thermometers, fluorescent bulbs, and printer cartridges. Double stream collection is now offered which has made collection of recyclables easier for both residents who participate individually as well as the private haulers.

The R-Board has added an additional recycling drop-off site to the Rock Hill district and is continuing to evaluate potential satellite recycling collection points to offer residents of the more rural areas of the county. The City also provides recycling support to the R-Board through their Department of Public Works. The City provides optional curbside collection to its residents as well as some cardboard collection to its businesses. It also maintains a residential drop-off site.

The R-Board maintains annual funding which assists with the purchase of individual recycling bins. These bins are distributed to residents during "special events" at the drop-off sites. The efforts of these two offices have enabled the recycling program of the R-Board to show a yearly increase in the amount of recyclables collected and processed each year as indicated on the graph in Appendix B.

### **5.3.1 Current Status**

Recyclable materials are generated by households and businesses. Packaging, such as cardboard boxes, plastics, glass, aluminum, and bi-metal cans, is a significant portion of the recyclables stream. Newsprint, office paper, and mixed paper are also significant. On a weight basis, yard waste is also a significant material. Certain materials, such as oil and batteries, are significant based on both their weight and their polluting potential. Currently, R-Board contracts are in place for disposition of a wide range of these materials.

The 2003 calendar year recycling results are indicated in Appendix B. The results indicate that a total of 27,745 tons of recyclables were accounted for within the service area. Of that amount, greater than 50 percent of the totals (approximately 14,200 tons) was managed through the landfill facilities.

### **5.3.2 Community Awareness/Participation**

The information for this analysis was obtained by interviewing the R-Board Solid Waste Director, the Stafford and Fredericksburg Recycling Coordinators, the recycling coordinator of Mary Washington College, several private haulers, the BFI representative, and the recycling coordinator of another jurisdiction. In addition, data from monthly recycling and waste generation reports from the past five years were reviewed. Further, all responses from businesses from the most recent survey, the recycling reports made to the State, and available waste characterization reports were reviewed.

Participation by institutions, businesses, and residents is significantly variable. The character of the region, which varies from urban to very rural, is likely responsible for some of the variability of participation. Lack of mandates may also add to the variability.

As the largest institution in the area, Mary Washington College (MWC) operates an independent institutional recycling program, at an estimated rate of approximately 50 percent. MWC's leaves are delivered to Tarmac directly; its scrap metal is collected by Hicks Co.; its oil and filters are collected by Rollins Co.; and its paper, newsprint, cans, glass, and construction/demolition/debris (CDD) are collected by BFI.

Residential participation is approximately 80 to 90 percent of single family residences in Fredericksburg, based on curbside collection estimates. Approximately 60 percent of the Fredericksburg residences are serviced by the City. It is assumed that the residential recyclables that are picked up in Fredericksburg are either delivered to the BFI Recyclery or the Landfill.

Residential participation is difficult to determine in Stafford, due to the mixture of private haulers, mobile drop-offs, and landfill drop-off. A telephone survey of several haulers indicates that approximately 15 to 20 percent of the County residents participate in the curbside recycling efforts by setting out the recycling bins.

### **5.3.3 Target Materials**

Materials which should be targeted include those that are significantly present in the waste stream now going to the landfill. Based on the percentages of recyclables in the waste stream, the major item is paper at 4.3 percent, followed closely by glass at 4.2 percent, and plastic at 2.8 percent. Metal cans totaled 1.5 percent. Miscellaneous others accounted for another 0.6 percent. Total recyclables in the waste averaged 13.4 percent.

Paper wastes from businesses appear to be a targetable material. While clean, white office paper and computer paper represent relatively valuable commodities, businesses should be encouraged to recycle nearly all of their waste paper. Offices typically have very little waste that cannot be classified as mixed paper, computer, or white office paper. Based on the annual survey of businesses in the area, current participation is rather low.

Plastics represent a difficult material due to bulkiness and the volatile nature of its market value. The landfill's baling system may help make plastics a suitable target. Targeting aluminum cans may not produce large tonnage increases, but may return better revenue.

Glass and paper remain as the greatest tonnage targets available from the waste stream. With the advent of mixed paper recycling, general paper, including junk mail, cartons, and office paper may be the target with the greatest potential impact. Glass may be a suitable target also, although markets are low at present.

The analysis of recyclables also indicates that recycled CDD, leaves, mulch, wood, and, yard waste is currently a major part of the recyclable stream. Targeting increased yard waste for collection at the landfill may increase tonnages significantly.

#### **5.3.4 Target Generators**

There are several sources from which recycling appears to have the greatest potential for improvement. The first is the private haulers. Recycling percentages brought by private haulers are relatively low. Measures to increase participation by private haulers have a good possibility of increasing overall recycling tonnages.

Small businesses are a prime target for improvement. Current levels of participation appear to be relatively low. A specific program to target small businesses may be necessary.

#### **5.3.5 Reporting**

Reporting of recycled quantities varies through the region. Consistent and dependable data reporting is available from the R-Board and BFI's Recyclery Facility. Several of the larger businesses which recycle provide well documented information. Many other businesses account for recycled materials less consistently.

During the periodic mailed survey of businesses, the quality of response varies widely. Based on the responses, it is often difficult to determine the disposition of recyclables. The R-Board recycling coordinator continues to develop more efficient strategies for collecting the data.

#### **5.3.6 Public Relations**

Public relations has been an important element since the inception of the recycling program. The R-Board and the City and County Coordinators have participated heavily in providing promotional activities, such as Earth Day celebrations. They have provided, and continue to provide, numerous public speeches, broadcast media interviews, newspaper articles, and educational activities.

Current public relations activities are a strong point of the overall program. Examples of current public relations materials, pamphlets, news articles, etc. are included in the Appendix F.

#### **5.3.7 Future Program Recommendations**

The original 1990 Solid Waste Management Plan included future recommendations that are listed below. Following each original recommendation is a description of the R-Board's current status regarding that issue.

- (a) Passage of local ordinances requiring recycling and reporting.

These ordinances have not been enacted yet because the jurisdiction feels that incentives are more effective than legal mandates.

- (b) City to require refuse to be placed curbside.

The city is considering the future reduction of behind-house refuse retrieval, but no action date has been set.

- (c) Evaluate joining with Spotsylvania County to utilize their MRF, or develop a new processing facility.

The R-Board has not joined with Spotsylvania's operation. The R-Board has developed its own limited processing facility. There have been initial discussions with Spotsylvania about the expansion of the recycling initiative.

### **5.3.8 Cost Effectiveness of Current Program**

The FY 2005 budget for the R-Board Recycling efforts shows a cost of \$477,935 and expected revenue of \$140,000, for a net cost to the R-Board of \$337,935. Based upon the recyclable data for 2003, included in Appendix C, this represents a cost of approximately \$25.25 per ton for materials handled by the jurisdictions.

The R-Board currently receives revenue from the sale of cardboard, newspaper/magazines, scrap metal, and oil/antifreeze. Co-mingled aluminum, glass, plastics, and metal cans are recycled by Fairfax Recycling at no cost or revenue to the R-Board. Recyclables with substantial commercial value, such as aluminum and newsprint, are often the target of fund-raising efforts by individuals or civic groups. Therefore, it is possible that the high value materials will be diverted from the recycle stream prior to being made available to the R-Board.

The R-Board funds its recycling program through revenues derived from landfill tipping fees. It uses approximately 21 percent of the revenues it generates to fund the recycling program.

### **5.3.9 Conclusions - Recycling Program**

The R-Board has developed a successful program for recycling and has met the state mandated goals in the past. However, the following areas are identified as needing continued improvement:

- (a) Business Participation/Reporting
- (b) Mobile Drop-off Participation/Contracting
- (c) Curbside Collection (Private Haulers)
- (d) Effective Public Relation and Educational Programs

#### **5.4 Waste-to-Energy**

The R-Board currently manages its waste tires through the use of the Fairfax resource recovery facility in Lorton, Virginia. As mentioned earlier, the R-Board will receive proposals for installing a landfill gas-to-energy facility at the landfill in 2005. The plan is for the facility to be completed during calendar year 2005. The future planned use of the landfill will provide significant landfill gas potential such that a landfill gas-to-energy facility would likely be expanded periodically to maintain pace with the additional gas flows.

#### **5.5 Landfill**

The R-Board's primary solid waste management activity, the regional landfill, has been distinguished by the VDEQ regional inspectors as a well managed, successful facility within the region.

## **6.0 FUNDING AND CONSTRUCTION SCHEDULES**

The R-Board prepares an annual budget in conjunction with the County's budget cycle for approval at an R-Board meeting, typically in late spring. A component process of the annual budget preparation is a tipping fee modeling tool the R-Board has developed that accounts for most of the revenues and expenses associated with the solid waste management program for the region. The model includes all costs for landfill operations and administration, equipment, site development, and recycling. The model is typically used to assist the R-Board with determining the unit costs associated with the solid waste management program and then establishing an appropriate tipping fee for the commercial wastes received at the landfill. This model and budgeting process has been used by the R-Board since its inception in 1987.

### **6.1 Funding and Budgeting**

The commercial tipping fees collected by the R-Board over the past 10 years have accumulated significant cash reserves due to a variety of specific site development issues. Continuing the structured tipping fee schedule that has been developed for the facility through the use of the cost model will provide sufficient funding for the current and planned solid waste management programming at the facility. Future disposal cells, closures, permitting and design, recycling expansion, and a variety of other solid waste management related issues are incorporated in the process. A copy of the Site Development page from the current version of the tipping fee model is included within Appendix C as an example of the funding preparation that is ongoing at the facility.

Separately, the R-Board conducts a third party audit of its financial records, policies and procedures to ensure the federal procedures for solid waste management accounting are met. For the past several years, the accounting firm, PBGH, from Harrisonburg, Virginia has been used. The most recent audit findings were issued by PBGH on January 10, 2005.

### **6.2 Construction Schedules**

As indicated previously, a copy of the Site Development page from the current version of the tipping fee model is included within Appendix C. The page indicates the planned sequencing of disposal cell construction and closures through 2025. Additional cost data is included such as the engineering costs, and other life cycle capital costs associated with development of the facility.



## **7.0 PUBLIC PARTICIPATION**

The R-Board is intentional about ensuring the local community and region is included throughout the planning and implementation process of the various solid waste management programs. Various community committees have been established such as the Recycling, Litter Prevention, and Schools Liaison. These committees provide a public forum for the development of ideas and have been instrumental in the success of such R-Board programs as Community Pride, Earth Day, and Household Hazardous Waste Collection days.

### **7.1 Public/Private Partnerships**

One strategy that is currently under review includes working on a variety of options with Goodwill Industries related to their recycling programs. Certain recyclable materials collected at the landfill may correlate with Goodwill's collection center plans allowing for potential economies of scale.

Construction Demolition Debris (CDD) is currently in a moratorium status at the landfill. The R-Board is considering making the moratorium permanent in order to extend the life of the facility and because there are already adequate private facilities in the region that can accommodate the material. The Fredericksburg BFI Recyclery discussed previously in Section 3.3.4 is an example of such a private facility.

The R-Board will continue to enhance the current list of strategies indicated previously in Section 3.5.

### **7.2 Resolutions**

At the R-Board's regularly scheduled meeting on May 19, 2004, a public hearing was held to solicit public comment on the draft Solid Waste Management Plan. Public comment was received and recorded in the minutes of the meeting. A resolution (RB04-08) was passed at the meeting adopting the draft plan as amended by the comments received at the meeting relative to the BFI Recyclery facility in Fredericksburg. A copy of the resolution and the minutes reflecting the affirmative vote is included in Appendix D.

## APPENDICES

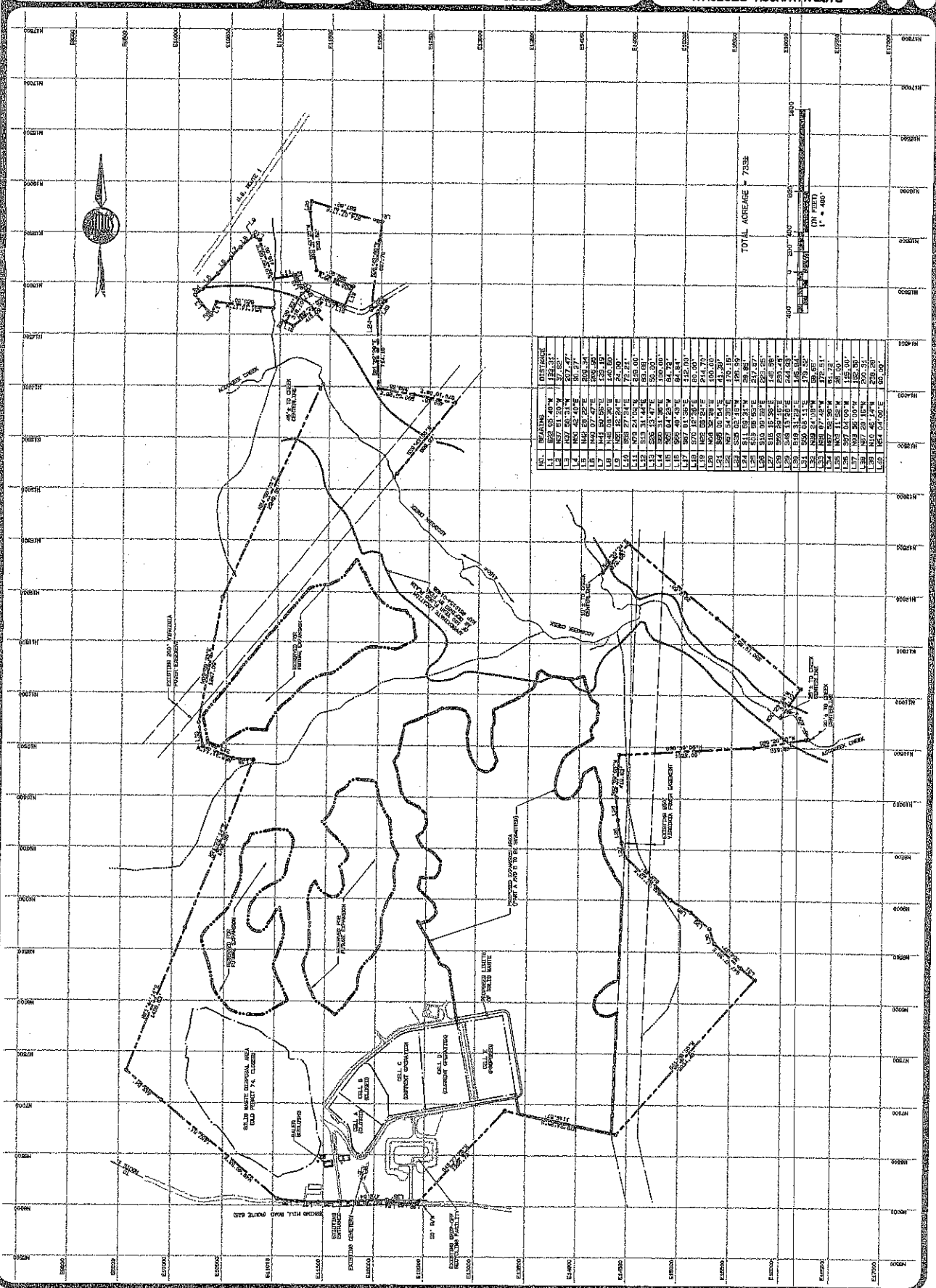
## APPENDIX A

REVISIONS:

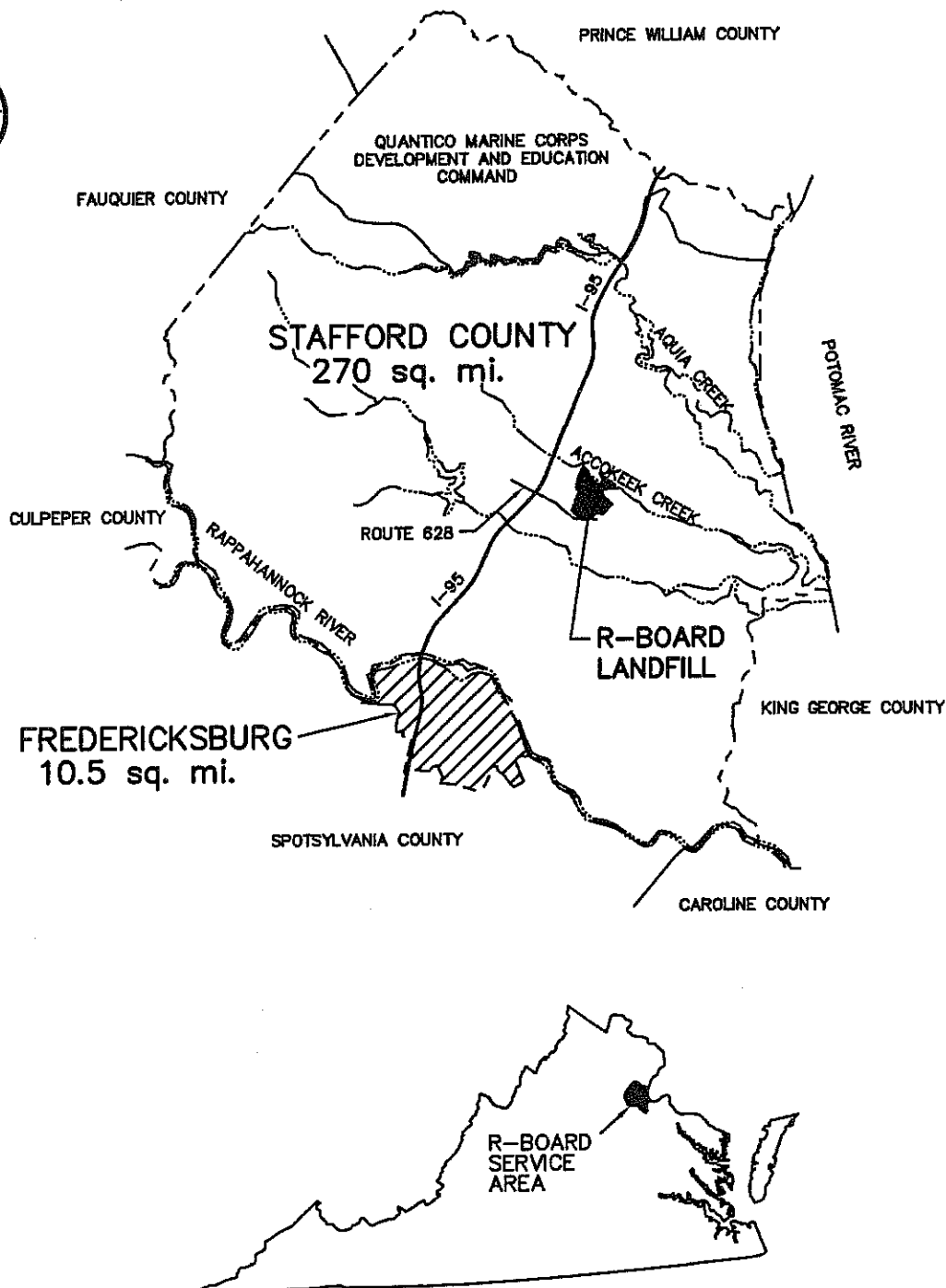
SCALE AS NOTED  
DATE: 12-18-2004  
CHECKED: R.H.  
DRAWN: S9  
DESIGNED: R.H.

**RAPPAHANNOCK REGIONAL  
SOLID WASTE MANAGEMENT BOARD**  
**SANITARY LANDFILL**  
**STAFFORD COUNTY, VIRGINIA**  
MASTER PLAN

PROJECT NO. 88071.05  
SHEET  
FIGURE 2



NO.	AREA (AC)	PERCENT
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94	1.00	0.14
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96	1.00	0.14
97	1.00	0.14
98	1.00	0.14
99	1.00	0.14
100	1.00	0.14



NOTE: ALL LOCATIONS ARE APPROXIMATE.

FIGURE 2  
R-BOARD SERVICE AREA  
STAFFORD COUNTY AND CITY OF  
FREDERICKSBURG

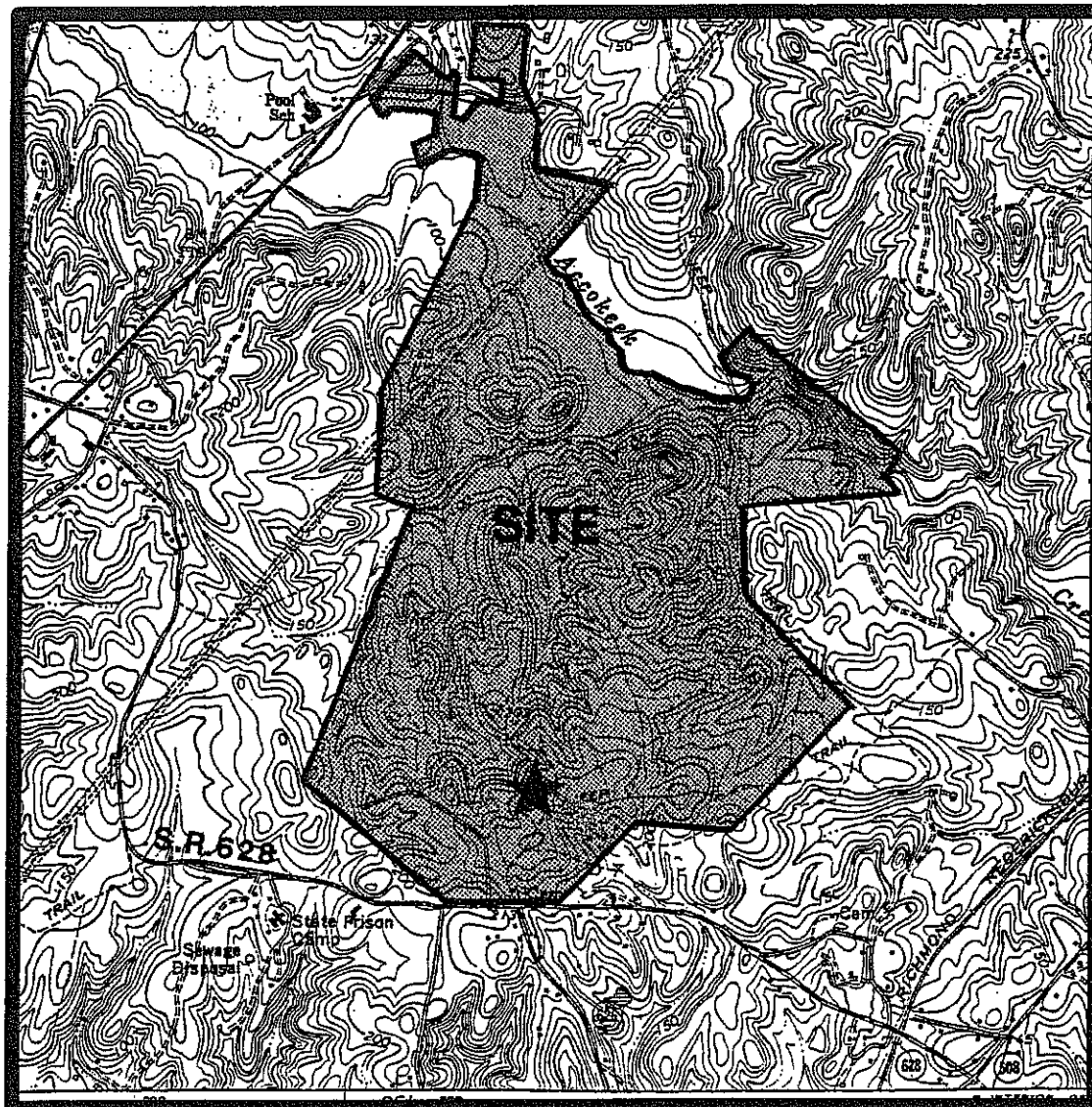
SCALE: 1" = 5 MILES



**RESOURCE**  
INTERNATIONAL, LTD.

ENGINEERS • SCIENTISTS • SURVEYORS • PLANNERS

P.O. BOX 6160 • 9560 KINGS CHARTER DRIVE • ASHLAND, VA 23005  
(804) 550-9200 • FAX (804) 550-9259



U.S.G.S. STAFFORD COUNTY, VA QUADRANGLE  
7.5 MINUTE SERIES  
SCALE: 1"=2000'

FIGURE 3  
SITE LOCATION MAP  
RAPPAHANNOCK REGIONAL  
SOLID WASTE MANAGEMENT BOARD  
STAFFORD COUNTY, VIRGINIA



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(804) 550-9200 • FAX (804) 550-9259

## APPENDIX B

# WASTE/SCRAP HAULER AND BUYER ADDRESS LIST

Trash Hauler	Contact	Phone #	Address	Res. Service	Comm. Service Trash/Rec.	Res. Curbside Recycling Service
Beam Cleaning Services, LLC		703-435-3751	1605 Bayou Ct., Herndon, VA 20170	?	?	?
BFI	Joyce Nadeau	540-373-2016	1321 Belman Rd., Fredericksburg, VA 22404		✓	
Browning Ferris Inc./BFI	Max Johns, General Manager	540-373-0033	1321 Belman Rd., Fredericksburg, VA 22404		✓	
City of Fredericksburg	Doug Fawcett, Director, Public Works Dept.	540-372-1023	P. O. Box 7447, Fredericksburg, VA 22404	✓	✓	✓
Davis Container	Michelle	540-899-7722	P. O. Box 29, Spotsylvania, VA 22553	✓		
Defense Finance Accounting	Kansas City Center (DFAS-KC/FE)	703-784-1922	1500 E. 9 <sup>th</sup> St., Kansas City, MO 61197-0001			
Hartwood Disposal	Robert Hensel	540-752-2195	101 Holy Corner Rd., Fredericksburg, VA 22046	✓	?	✓
Hildrup Transfer	Darcy (Accounts Payable)		P. O. Box 1290, Stafford, VA 22554			
Rader Tire, LLC	Mike Rader	703-843-3123	467 Ferry Rd., Fredericksburg, VA 22405	N/A	N/A	N/A
Recycle America Alliance	Ed Duke, Site Manager	703-250-0500	10400 Premier Ct., Burke, VA 22015	N/A	N/A	N/A
Republic Services of VA						
D/B/A AAA Rainbow	Phil Auld	703-818-8222	4619 West Ox Rd., Fairfax, VA 22030	✓	✓	✓
Shiflett Trash	Mr. or Mrs. Shiflett	540-373-9336	P. O. Box 6473, Fredericksburg, VA 22403	✓		✓
SimsMetal America	Stuart Cohn		14144 Jeff Davis Hwy, Woodford, VA 22580			
Southeast Paper	Anita Grayson	703-794-9198	14811 Dumfries Rd, Manassas, VA 20112			
Waste Management	Lori Jennings	540-288-3627	45 Utah Place, Falmouth, VA 22405	✓	✓	✓



## Recycling in Stafford is Easy

### Use Private Haulers:

Check with your Homeowner's Association. You may already have service provided. If you are interested in using a private hauler call: Waste Management 288-3620/1-800-969-2069, Shifflett's Trash 540-373-9336, Davis Disposal 540-899-7722, or Hartwood Disposal 540-752-2195.

### Go to the Landfill:

The Rappahannock Regional Solid Waste Management Board (R-Board) is a joint venture of Stafford and Fredericksburg that operates and maintains the regional landfill and recycling facility for the use and benefit of citizens of Stafford and Fredericksburg. Bring your recyclables to the landfill.

489 Eskimo Hill Rd  
(2 miles south of the Courthouse off Route 1 @ the red light)

Visit Stafford's 4 Drop-off Sites  
(Weekends Only):

### GEICO DROP-OFF CENTER

Located off of Route 17 on Stafford Lakes Pkwy behind GEICO complex.

### ROCK HILL DROP-OFF CENTER

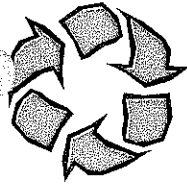
Located at North Stafford High School at 839 Garrisonville Rd.

### WIDEWATER DROP-OFF CENTER

Located next to Potomac Hills Fire House at 3528 Jeff Davis Hwy.

### WHITE OAK DROP-OFF CENTER

Located at Earl's True Value Hardware at 101 White Oak Rd.



*Recycling begins  
and ends with you!*

### TIPS

to

### Be a Better Recycler

- Rinse out any containers with food residue.
- Don't pour HHW on the ground or down the drain. RECYCLE IT!
- Pay attention to what you put in your recycling bin, it's not a trash can.
- CLOSE THE LOOP! Purchase goods made of recycled content materials.



Recycling / Litter Prevention  
1259 Courthouse Rd., Ste. 104  
P. O. Box 339  
Stafford, VA 22555-339

Phone: 540-658-4579 or 540-658-8680

Fax: 540-658-4523

Email: jmay@co.stafford.va.us

Website: <http://www.co.stafford.va.us/recycling>

# RECYCLING IN STAFFORD COUNTY



## REDUCE

## REUSE

## RECYCLE

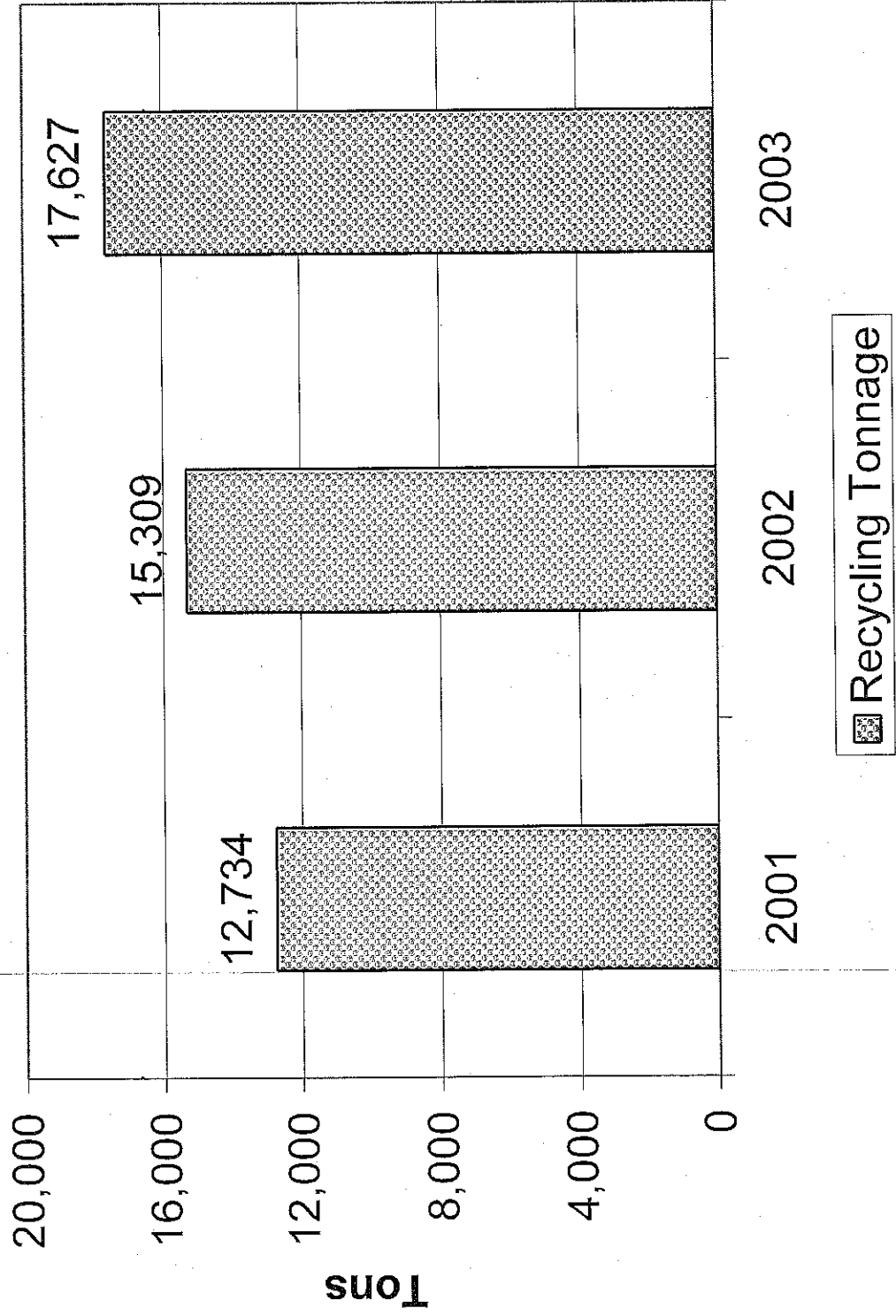
<http://www.co.stafford.va.us/recycling>

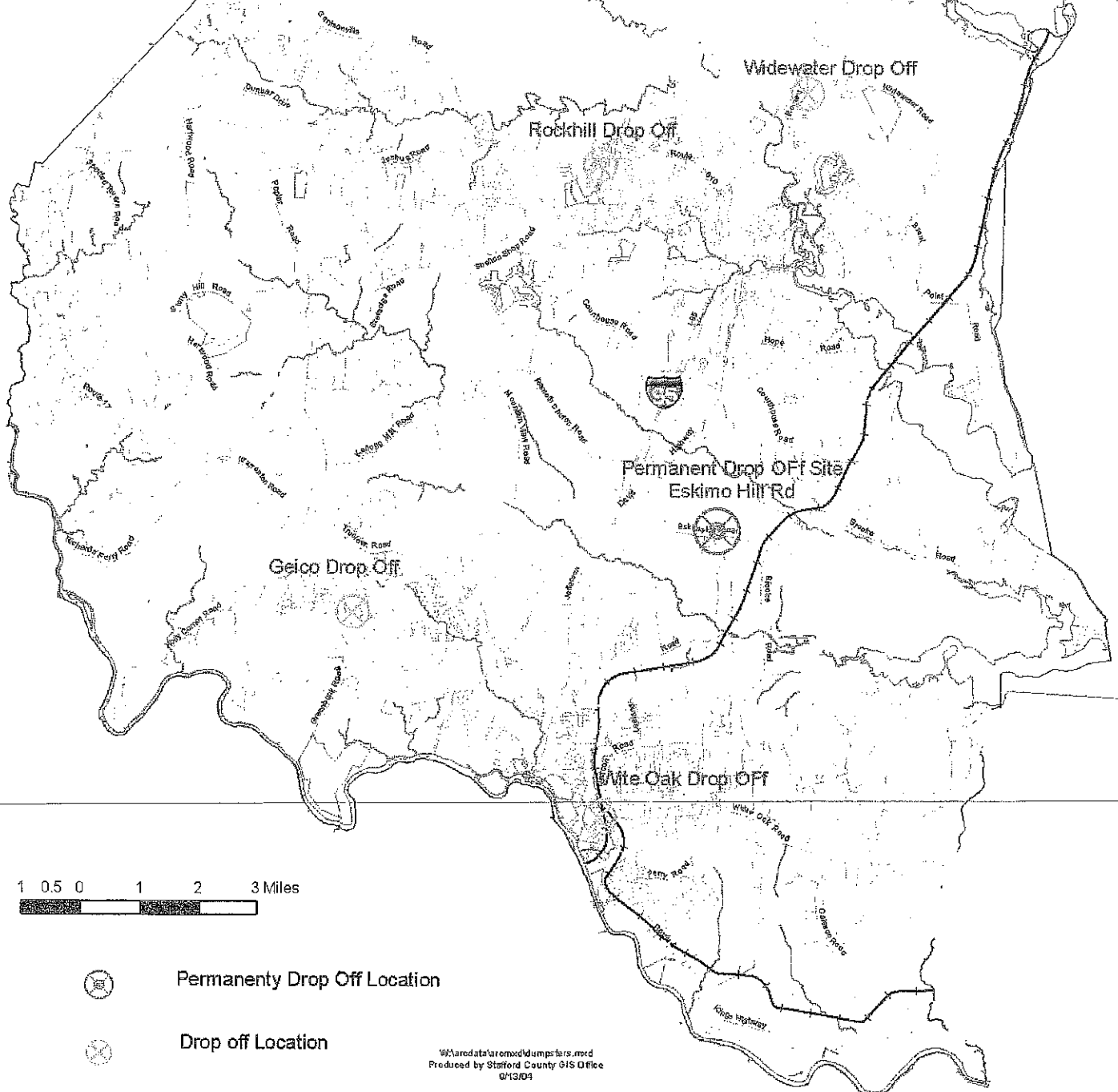
RECYCLABLE ITEMS	WHAT TO INCLUDE	RECYCLE LOCATIONS
* Aluminum	Soda, beer cans, foil, and pie plates Large metal items go in scrap metal.	Eskimo Hill Landfill & Drop-off sites
Antifreeze	Antifreeze only — <u>DO NOT</u> mix with other fluids.	Eskimo Hill Landfill
Auto & Equipment Batteries	See gate attendant.	Eskimo Hill Landfill
* Steel/Tin cans	Vegetable, soup and pet food cans	Eskimo Hill Landfill & Drop-off sites
Cardboard	Flattened brown corrugated, Waxed cardboard is not accepted.	Eskimo Hill Landfill & Drop-off sites
Cell Phones	See gate attendant.	Eskimo Hill Landfill
Electronics	Computers, monitors, stereos, and TVs No wooden console TV's — No Microwaves	Eskimo Hill Landfill
* Glass Food Containers	Clear, brown and green jars and bottles NO plates, windows, mirrors, drinking glasses or light bulbs	Eskimo Hill Landfill & Drop-off sites
Household Batteries	All batteries	Eskimo Hill Landfill
Household Hazardous Waste (HHW)	Special Collection Days for paint, pesticides, cleaners, and oils	Eskimo Hill Landfill & Belman Road Center
Printer Cartridges	All printer cartridges Recycle Fax and Copier cartridges	Eskimo Hill Landfill
Magazines	All magazine publications and catalogs.	Eskimo Hill Landfill & Drop-off sites
Motor Oil	Motor oil and Kerosene only <u>DO NOT</u> mix with other fluids	Eskimo Hill Landfill
Newspaper	Newspapers with normal amounts of glossy inserts NO plastic bags. These can be recycled at area grocery stores.	Eskimo Hill Landfill & Drop-off sites
Phone Books	Year round collection.	Eskimo Hill Landfill
* Plastics (all codes)	Milk jugs, soda bottles, colored resin i.e. detergent bottles. NO plastic bags. These can be recycled at area grocery stores.	Eskimo Hill Landfill & Drop-off sites
Propane Tanks	Special Collection Area Check in with Gate Attendant.	Eskimo Hill Landfill
Scrap Metal	All kinds of scrap metal. NO propane tanks. Ask Gate Attendant.	Eskimo Hill Landfill
Yard Waste	Limbs < 4" diameter, leaves, brush, and grass clippings.	Eskimo Hill Landfill
White Office Paper	Letterhead/white copy paper, notebook paper, green-lined computer paper, and junk mail printed on white paper.	Eskimo Hill Landfill
Mercury	See gate attendant.	Eskimo Hill Landfill
Fluorescent bulbs	See gate attendant.	Eskimo Hill Landfill

• Means items are collected together in one container

• Hours @ Eskimo Hill: Monday - Friday 8:00 a.m. - 5:00 p.m. Saturday 8:00 a.m. - 4:00 p.m. Sunday 8:00 a.m. - 3:00 p.m.

## Eskimo Hill Road Recycling (CY)





\\saredata\saremod\dumpsters.mxd  
Produced by Stafford County GIS Office  
9/13/04

## APPENDIX C

SITE DEVELOPMENT COSTS

FISCAL YEAR

Cost Item	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
<b>SITE DEVELOPMENT COSTS</b>																					
Site Development																					
Phase I - Cell E	\$2,200,000																				
Phase II - Cell F			\$3,569,300																		
Closure - Cells B/C/D		\$1,872,000																			
Phase II - Cell G							\$4,175,600	\$2,368,700													
Closure - Cells D/E/F																					
Phase II - Cell H																					
Closure - Cells F/G																					
Phase II - Cell I																					
Closure - Cells G/H																					
Phase II - Cell J																					
Closure - Cells H/I																					
Scallex	\$125,000																				
Landfill Gas Flare/Piping	\$250,000		\$100,000				\$316,300	\$131,600		\$355,800	185,000		\$400,300	\$186,500		\$450,200	\$93,600	\$194,800	\$6,685,200	\$3,792,300	
Facility Improvements-Buildings																					
Subtotal Site Dev.	\$2,575,000	\$1,872,000	\$3,669,300	\$281,200	\$0	\$0	\$4,491,900	\$2,500,300	\$0	\$355,800	\$5,089,800	\$2,771,000	\$400,300	\$186,500	\$5,714,500	\$3,241,700	\$97,300	\$101,200	\$105,200	\$109,500	\$113,800
<b>Site Development Engineering</b>																					
Engr/Surv Design & Constr Services	\$52,000	\$54,000	\$56,200	\$58,400	\$60,800	\$63,200	\$65,700	\$68,400	\$71,100	\$73,900	\$76,900	\$80,000	\$83,200	\$86,500	\$90,000	\$93,600	\$97,300	\$101,200	\$105,200	\$109,500	\$113,800
Engr Design Cell E																					
Closure Engr C/D/E			\$81,100		\$87,700																
Engr Design Cell F/G/H		\$156,000																			
Closure Engr F/G/H																					
Engr Design Cell I/J																					
Closure Engr Cell I/J																					
Financial Assurance Documentation	\$2,500	\$2,600	\$2,700	\$2,800	\$2,900	\$3,000	\$3,200	\$3,300	\$3,400	\$3,600	\$3,700	\$3,800	\$4,000	\$4,200	\$4,300	\$4,500	\$4,700	\$4,900	\$5,100	\$5,300	\$5,500
Permitting Phase II (Expansion Area)	\$98,000	\$154,000	\$154,000			\$126,500										\$180,100					\$219,100
Subtotal Site Dev. Engr.	\$153,500	\$366,600	\$140,000	\$61,200	\$151,400	\$68,200	\$195,400	\$71,700	\$74,500	\$281,000	\$80,600	\$83,800	\$87,200	\$90,700	\$94,300	\$278,200	\$102,000	\$106,100	\$110,300	\$114,800	\$338,400
<b>TOTAL SITE DEVELOPMENT COST</b>	\$2,728,500	\$2,238,600	\$3,809,300	\$342,400	\$151,400	\$68,200	\$4,687,300	\$2,672,000	\$74,500	\$646,800	\$5,150,400	\$2,854,800	\$487,500	\$257,200	\$5,808,800	\$3,970,100	\$102,000	\$300,900	\$6,795,500	\$3,907,100	\$557,500

## **APPENDIX D**

RB04-08

PROPOSED

RAPPAHANNOCK REGIONAL  
SOLID WASTE MANAGEMENT BOARD

RESOLUTION

At a regular meeting of the Rappahannock Regional Solid Waste Management Board (R-Board) held in Conference Rooms A,B,C, Stafford County Administration Center, Stafford, Virginia on the 19<sup>th</sup> day of May, 2004;

Members:

Vote:

Peter J. Fields, Chairman  
William C. Withers, Jr., Vice-Chairman  
Steve Crosby  
Kandy A. Hilliard  
Matthew J. Kelly  
Phillip L. Rodenberg

On motion of, seconded by, which carried by a vote of, the following was adopted:

**A RESOLUTION TO ADOPT THE RAPPAHANNOCK REGIONAL SOLID WASTE  
MANAGEMENT BOARD'S SOLID WASTE MANAGEMENT PLAN UPDATE**

WHEREAS, notices have been posted in the local newspaper on May 8 and May 15 to advertise a public hearing on the R-Board's Solid Waste Management Plan Update; and

WHEREAS, the Plan Update serves the City of Fredericksburg and the County of Stafford; and

WHEREAS, this Plan includes information on demographics, waste generation rates, recycling plans, funding and implementation plans; and

WHEREAS, the initial study was performed in December 1990;

NOW, THEREFORE, BE IT RESOLVED by the Rappahannock Regional Solid Waste Management Board on this the 19<sup>th</sup> day of May, 2004, that the R-Board's Solid Waste Management Plan Update be and it hereby is approved and adopted.

/pr



**RAPPAHANNOCK REGIONAL  
SOLID WASTE MANAGEMENT BOARD**

Wednesday

May 19, 2004

Stafford County Administration Center  
Conference Rooms A,B,C

Meeting Convened. A regular meeting of the Rappahannock Regional Solid Waste Management Board (R-Board) was called to order by Chairman Peter J. Fields, at 1:30 P.M., Wednesday, May 19, 2004, at Stafford County Administration Center, Conference Rooms A,B,C.

Roll Call. The following members were present: Peter J. Fields, Chairman; William C. Withers, Jr., Vice Chairman; Kandy A. Hilliard; Matthew J. Kelly; Phillip L. Rodenberg; and Steve Crosby.

Also in attendance were: William H. Hefly, R-Board Attorney; Robert L. Hundley, Consulting Engineer; Andrew J. Mikel, Landfill Superintendent; Diane L. Jones, Recycling Coordinator; and Patricia S. Rowe, Executive Assistant to the R-Board. Max Johns and Brenda Gibbs with BFI attended as well.

Mr. Kelly motioned, seconded by Ms. Hilliard, to approve the March 17, 2004 minutes.

By voice, the vote was:

Yea: (6) Crosby, Fields, Hilliard, Kelly, Rodenberg, Withers

Nay: (0)

Report of the R-Board Attorney. Mr. Hefly reported on the following:

- No litigation at this time.

Report of the Consulting Engineer. Mr. Hundley reported on the following:

- **Permit No. 74 (Old Stafford County Landfill – Post Closure).** SCS Field Services (SCSFS) recently completed the most recent surface emissions monitoring required for compliance with the facility's air permit. To date no emission levels have been detected above compliance thresholds.
- **Weekly gas monitoring continues at the Permit No. 74 disposal area** due to detection of concentration levels above the compliance limit. Three consecutive weeks of below compliance level readings have recently been documented. Resource will inform the DEQ that monthly gas monitoring will now begin in accordance with the facility's contingency plan.
- **Permit No. 589 (Cells A/B/C/D – Active)** The Cell E draft design drawings are complete and a formal submittal will be made to the DEQ within the next two weeks.
- The Part A Permit (hydrogeologic investigation) work for the proposed expansion is nearly complete. An endangered species investigation on the small whorled pogonia must be performed and is planned for late spring.
- **Fredericksburg Landfill.** Weekly gas monitoring continues at the facility. One and sometimes two monitoring wells continue to exhibit gas readings slightly above compliance levels. The Organic Waste Technologies technician is working to install

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additional remedial components to the system in order to ensure vacuum is equally applied to the remaining non-compliant area.

Mr. Rodenberg asked if the Fredericksburg landfill continues with gas levels above compliance levels, what is the next step. Mr. Hundley replied that when there is a long wet period, a lot of water in the wells lowers the effectiveness of sucking the gas out and the contractor will be continuously pumping out the wells until improvement is seen.

Report on Finances. Mr. Crosby reported on the following:

- Landfill Aging Report
- Weight and Vehicle Records and Analysis
- Tonnage By Hauler
- Landfill Revenue
- Landfill Expenses

Mr. Crosby reported that currently the R-Board is taking in 13,000-14,000 tons per month that will put the landfill on pace this year for about 160,000 tons. The cash flow will exceed the commercial revenue estimates in the neighborhood of \$1,000,000 for this year.

Ms. Hilliard asked if the accelerated rate of trash puts pressure on the time line for the new cell. Mr. Hundley replied that it does. Ms. Hilliard asked if the issue of construction and demolition debris should be addressed. Mr. Crosby replied that the landfill is accepting construction and demolition debris at \$40 per ton but at the current rate Cells C/D will be full in about one year. That is why the decision was made to construct Cell E under the current permit. Mr. Crosby said the issue of construction and demolition debris may certainly have to be addressed in future meetings.

Report of the Solid Waste Manager. Mr. Crosby reported on the following:

- Mr. Crosby introduced Anthony Romanello, Deputy County Administrator, who will be phasing into the role of daily supervision and oversight responsibilities.
- Andrew Mikel was introduced as the new landfill superintendent and has already started making operational improvements and will be taking on more administrative responsibility beyond the daily operations. Mr. Crosby also shared that Andrew had received a meritorious service medal from the Marine Corps for his work in the first Gulf War with dust abatement having to do with helicopters in a desert environment.

Ms. Jones reported on the following:

- Community Pride Program and spring cleanups totaled 309,000 pounds of debris picked up.
- Future plans are in the works on doing a hazardous waste program with the Home Depot store.
- Hazardous Waste Program has leveled out with 175 people participating from the two jurisdictions.
- The DEQ report showed 27.5% recycling rate.

05/19/04 - Page 3

- There have been no rejection loads at the landfill. This is credited to great work done by the landfill employees.

Mr. Crosby reported on the FY2005 Budget as follows:

- Three new positions proposed as a reflection of the increased waste coming in and the dramatic use of overtime used this past year.
- Positions would be 2 Maintenance Workers and one Equipment Operator.
- Dramatic Increase in repairs and maintenance for major rebuilds on compactor wheels and track loader power train and tracks.
- Machinery and equipment replacement includes funds to replace the scales, tractor and several 40-yard containers.
- \$2.3 million to construct Cell E and expand the gas flare system to Cells A & B.

Mr. Fields asked how many cells are mapped out. Mr. Hundley responded that the new area after Cell E will be 70-75 acres. Cell sizes are ranging 7 to 7-1/2 acres but may be increased due to increased tonnage. The new area could possibly accommodate 6-10 cells. The 75 acres could possibly extend the life to 20-30 years depending on tonnage. Mr. Hundley stated that the entire site is 733 acres with the old #74 area being 35-40 acres and the area of A,B,C,D is 25 acres.

Ms. Hilliard motioned, seconded by Mr. Withers, to approve proposed Resolution RB04-07.

By voice, the vote was:

Yea: (6) Crosby, Fields, Hilliard, Kelly, Rodenberg, Withers  
Nay: (0)

Proposed Resolution RB04-07 reads as follows:

**RAPPAHANNOCK REGIONAL SOLID WASTE MANAGEMENT BOARD  
(R-BOARD) BUDGET**

WHEREAS, the R-Board has reviewed the proposed fiscal year 2005 Budget; and

WHEREAS, the R-Board finds the fiscal year 2005 Budget to be acceptable;

NOW, THEREFORE, BE IT RESOLVED by the Rappahannock Regional Solid Waste Management Board on this the 19th day of May, 2004, that the proposed Fiscal Year 2005 Budget be and it hereby is approved in the total amount of FIVE MILLION, EIGHT HUNDRED SEVENTEEN THOUSAND AND SIXTEEN DOLLARS (\$5,817,016).

**PUBLIC HEARING.**

Mr. Hundley stated that the Solid Waste Management Plan (SWMP) is a separate regulation that is required by VDEQ for all solid waste management regions and the R-Board is an identified solid waste management region. The City of Fredericksburg and Stafford County were designated as the solid waste management region for this area by VDEQ in 1987. SWMP is a requirement of a separate set of regulations that is updated on basically a four-year period. Resource prepared a plan in 1996 and updated it again in 2000. SWMP requires that waste

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management regions look at all the different types of solid waste disposal in their areas and requires the R-Board to consider and to evaluate its program on a hierarchy that the state has established and that hierarchy includes source reduction, reuse, recycling, resource recovery, incineration and landfilling. The R-Board utilizes landfilling the most because it is the most cost effective. The R-Board is required to evaluate its program on that hierarchy and address that hierarchy in the plan. A large portion of the plan is the recycling mandate of 25% rated by locality as prepared by Ms. Jones and Mr. King of the City. It describes the recycling rate, what was used, how the private industries were surveyed in terms of recycling, and education, which is all incorporated into an integrated waste management strategy with goals and objectives and to be delineated into the plan.

The Public Hearing opened at 2:05 P.M. Mr. Max Johns and Ms. Brenda Gibbs with BFI attended the Public Hearing and Mr. Johns asked if BFI could submit changes through the R-Board and Mr. Crosby. Mr. Johns also asked about construction debris and whether that might be considered a waste stream and was that considered in the Plan. Mr. Hundley replied that yes, all waste streams had to be identified by category percentage wise and debris waste has been running around 20-25%. Mr. Johns stated that he would like to work directly with Resource to add BFI's waste stream into the plan. The Public Hearing closed at 2:08 P.M.

Mr. Withers motioned, seconded by Ms. Hilliard, to approve proposed Resolution RB04-08.

By voice, the vote was:

Yea: (6) Crosby, Fields, Hilliard, Kelly, Rodenberg, Withers  
Nay: (0)

**Proposed Resolution RB04-08 reads as follows:**

**A RESOLUTION TO ADOPT THE RAPPAHANNOCK REGIONAL SOLID WASTE MANAGEMENT BOARD'S SOLID WASTE MANAGEMENT PLAN UPDATE**

WHEREAS, notices have been posted in the local newspaper on May 8 and May 15 to advertise a public hearing on the R-Board's Solid Waste Management Plan Update; and

WHEREAS, the Plan Update serves the City of Fredericksburg and the County of Stafford; and

WHEREAS, this Plan includes information on demographics, waste generation rates, recycling plans, funding and implementation plans; and

WHEREAS, the initial study was performed in December 1990;

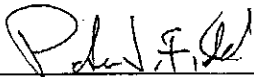
NOW, THEREFORE, BE IT RESOLVED by the Rappahannock Regional Solid Waste Management Board on this the 19<sup>th</sup> day of May, 2004, that the R-Board's Solid Waste Management Plan Update be and it hereby is approved and adopted.

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Future Session. The next meeting will be held on Wednesday, July 28, 2004, 1:30 P.M., Stafford County Administration Center, Conference Rooms A, B, C.

Mr. Fields asked support from the R-Board to provide relief for the citizens of Belle Plains and to waive fees for that emergency situation where a lot of trees were destroyed caused by the microburst in that area.

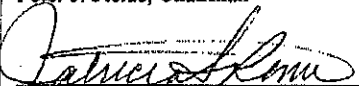
Adjournment. The Chairman adjourned the meeting at 2:10 P.M.



Peter J. Fields, Chairman



William C. Withers, Jr., Vice Chairman



Patricia S. Rowe, Clerk

## **APPENDIX E**

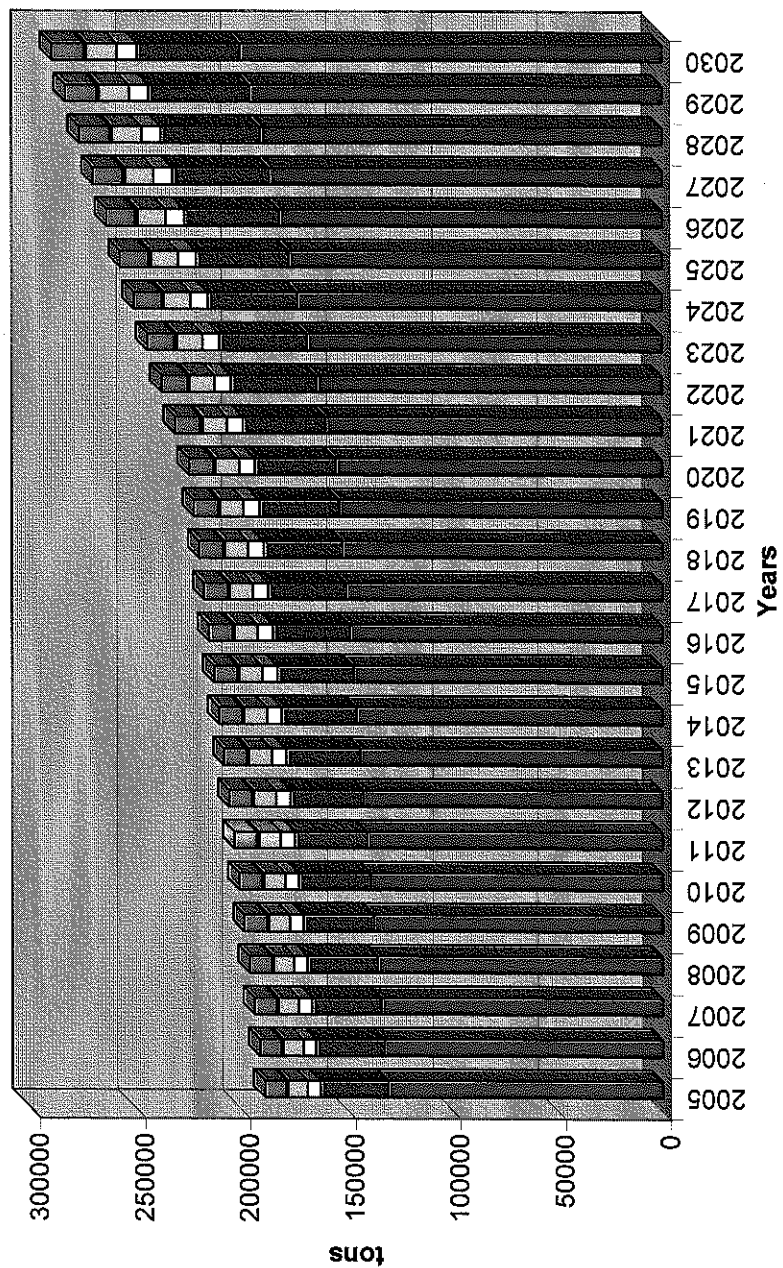
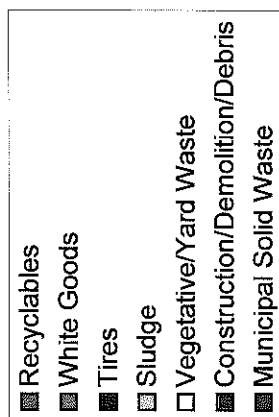
## Rappahannock Regional Solid Waste Management Board

### HISTORICAL SOLID WASTE DATA (TONS)

Material Type	Calendar Year				
	2000	2001	2002	2003	2004
Municipal Solid Waste	64,859	47,141	103,742	133,500	138,876
Construction/Demolition/Debris	30,201	18,667	12,933	24,006	16,610
Industrial Waste	N/A	N/A	N/A	N/A	N/A
Regulated Medical Waste	N/A	N/A	N/A	N/A	N/A
Vegetative/Yard Waste	256	697	10,829	11,284	7,283
Incineration Ash	N/A	N/A	N/A	N/A	N/A
Sludge	N/A	N/A	8,089	8,090	11,136
Tires	210	390	482	599	1,110
White Goods	429	600	24	16	71
Friable Asbestos	N/A	N/A	N/A	N/A	N/A
Petroleum Contaminated Soil	N/A	N/A	N/A	N/A	N/A
Waste Oil	N/A	N/A	N/A	N/A	N/A
Batteries	N/A	N/A	N/A	N/A	N/A
Recyclables	3,243	6,656	4,400	5,629	11,659

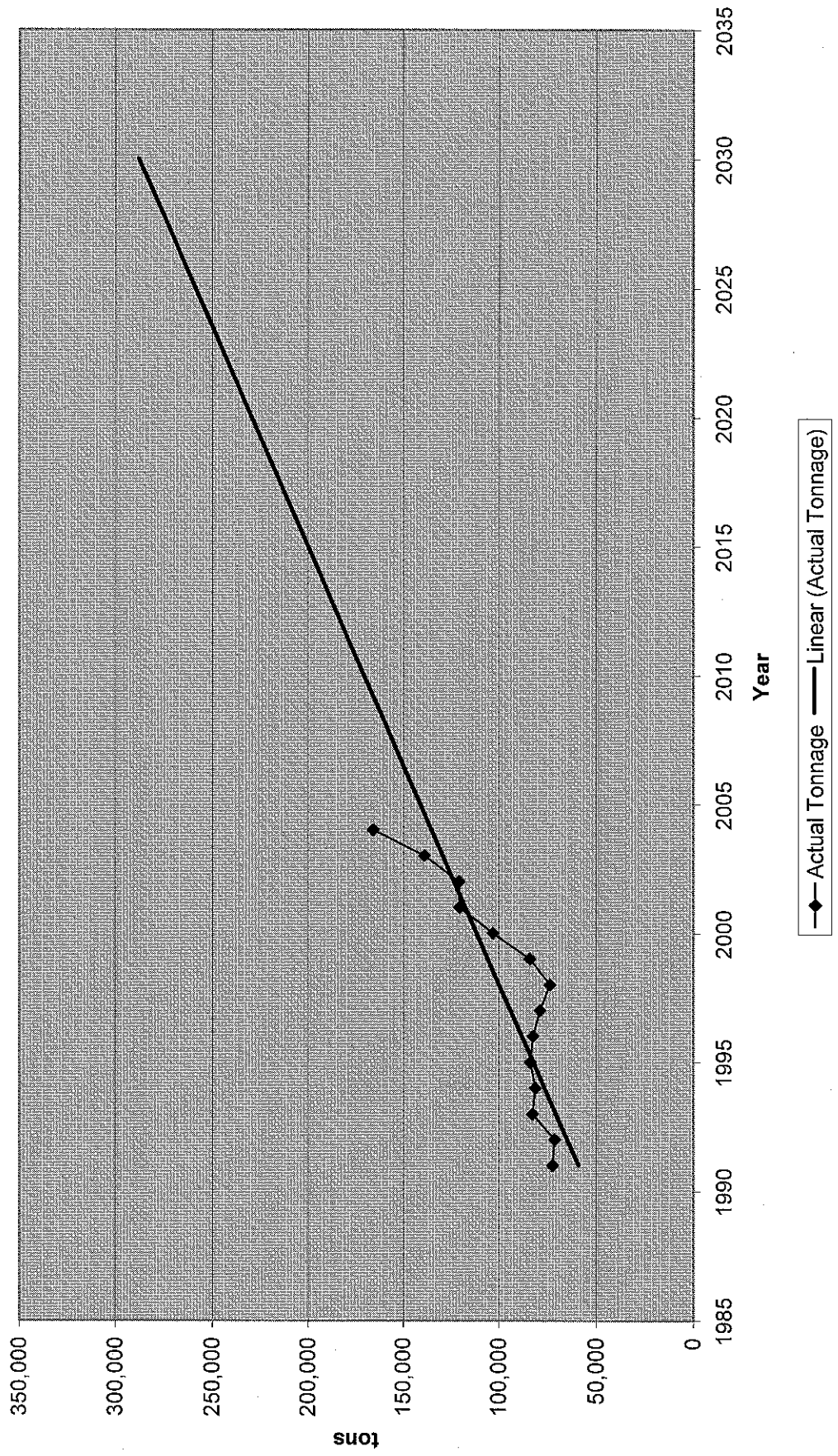
N/A = Not available (not tracked by or reported to the R-Board)

# Projected Waste Material Flows





**Figure 2-2**  
**Annual Tonnage Projections**  
**(Using 1991-2004 Trend)**



## **APPENDIX F**

**Permitted Active and Closed Solid Waste Facilities  
Rappahannock Regional Solid Waste Management Board Service Area**

Solid Permit ID	Solid Permit ID	Facility Name	Site County	Location Address	Location City	Solid Waste Unit Type	Solid Waste Unit Status	Solid Permit Status
PBR	107	BFI Fredericksburg Recyclery	Fredericksburg City	1321 Belman Rd	Fredericksburg	Materials Recovery Facility [SW]	Active	Permitted
PBR	120	Mary Washington Hospital	Fredericksburg City	1001 Sam Perry Blvd	Fredericksburg	RMW Steam Sterilizer [SW]	Active	Permitted
PBR	159	Mary Washington College	Fredericksburg City	1301 College Ave	Fredericksburg	RMW Steam Sterilizer [SW]	Active	Permitted
PBR	234	Elliot Patricia L MD	Fredericksburg City			RMW Steam Sterilizer [SW]	Closed	Revoked
PBR	252	DMHWRAS - Northern VA Training Center - Fburg	Fredericksburg City	103 Westwood Office Park	Fredericksburg	RMW Storage Facility [SW]	Closed	-
PBR	254	Hazleton Laboratories America Incorporated	Fredericksburg City			RMW Steam Sterilizer [SW]	Closed	Revoked
PBR	264	Mary Washington Hospital	Fredericksburg City	1001 Sam Perry Blvd	Fredericksburg	RMW Steam Sterilizer [SW]	Closed	Revoked
PBR	349	DOC - Haymarket Correctional Unit 26	Stafford County	2115 James Madison Hwy		RMW Storage Facility [SW]	Closed	Permitted
SWP	032	Cool Springs Road Landfill	Stafford County	131 Cool Springs Rd	Stafford	Closed CDD Landfill [SW]	Post-Closure	Permitted
SWP	074	Rappahannock Regional Solid Waste Management Board	Stafford County	498 Eskimo Hill Rd	Stafford	Closed Sanitary Landfill [SW]	Permit Revoked	Revoked
SWP	097	Chancellor Sanitary Landfill	Fredericksburg City	5917 Harrison Rd	Fredericksburg	Closed CDD Landfill [SW]	Closed	Permitted
SWP	098	Lee Hill Landfill	Fredericksburg City	9904 Lee Hill Park Rd	Fredericksburg	Closed CDD Landfill [SW]	Closed	Permitted
SWP	369	Ayoub George	Stafford County			Closed CDD Landfill [SW]	Closed	Permitted
SWP	374	Robertson Landfill	Fredericksburg City	MCB Quantico	Quantico	Miscellaneous [SW]	Closed	Permitted
SWP	411	US Marine Corps - Quantico	Stafford County			Closed Sanitary Landfill [SW]	Post-Closure	Permitted
SWP	447	Faught Construction County Landfill	Stafford County			Closed CDD Landfill [SW]	Closed	Permitted
SWP	503	Chancellor Sanitary Landfill	Fredericksburg City	5917 Harrison Rd	Fredericksburg	Closed Sanitary Landfill [SW]	Post-Closure	Permitted
SWP	509	Rappahannock Regional Solid Waste Management Board	Stafford County	498 Eskimo Hill Rd	Stafford	Sanitary Landfill [SW]	Closed	Revoked
SWP	589	Rappahannock Regional Solid Waste Management Board	Stafford County	498 Eskimo Hill Rd	Stafford	Closed Sanitary Landfill [SW]	Post-Closure	Permitted
SWP	589	Rappahannock Regional Solid Waste Management Board	Stafford County	498 Eskimo Hill Rd	Stafford	Sanitary Landfill [SW]	Active	Permitted



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### WHITE OAK LANDFILL

#### Site Information

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[Actions](#) | [Contaminants](#) | [Site-Specific Documents](#)

**Site Name:** WHITE OAK LANDFILL

**Street:** VA. ROUTE 218

**City / State / ZIP:** WHITE OAK, VA 22401

**NPL Status:** Not on the NPL

**Non-NPL Status:** SI Ongoing

**EPA ID:** VA0000100099

**EPA Region:** 03

**County:** STAFFORD

**Federal Facility Flag:** Not a Federal Facility

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## **APPENDIX G**

### Current Disposal Capacity Summary

Permitted Phase	Permitted Waste Footprint (acres)	Remaining Volume (cy) <sup>a</sup>	Remaining Volume (tons) <sup>b</sup>	Life Estimate (years) <sup>c,f</sup>
Cell A thru Cell D	21.5	469,028	234,514	1

### Proposed Disposal Capacity Summary

Proposed Phase	Proposed Waste Footprint (acres)	Proposed Volume (cy)	Proposed Volume (tons)	Life Estimate (years) <sup>f</sup>
Cell E Pending Part B Application	8.0	978,870	489,435	3 <sup>d</sup>
Cell F thru Cell M Phase II Expansion <sup>g</sup> Pending Part A Application	80.5	16,500,000	8,250,000	41 <sup>e</sup>

#### Notes:

<sup>a</sup> Based on 2004 Solid Waste Information and Assessment Program Reporting Table

<sup>b</sup> Base on a in-place Density of 0.55 tons/cy

<sup>c</sup> Based on a rate of 166,622 tons/year (534 tons/day)

<sup>d</sup> Based on a rate of 175,000 tons/year (561 tons/day)

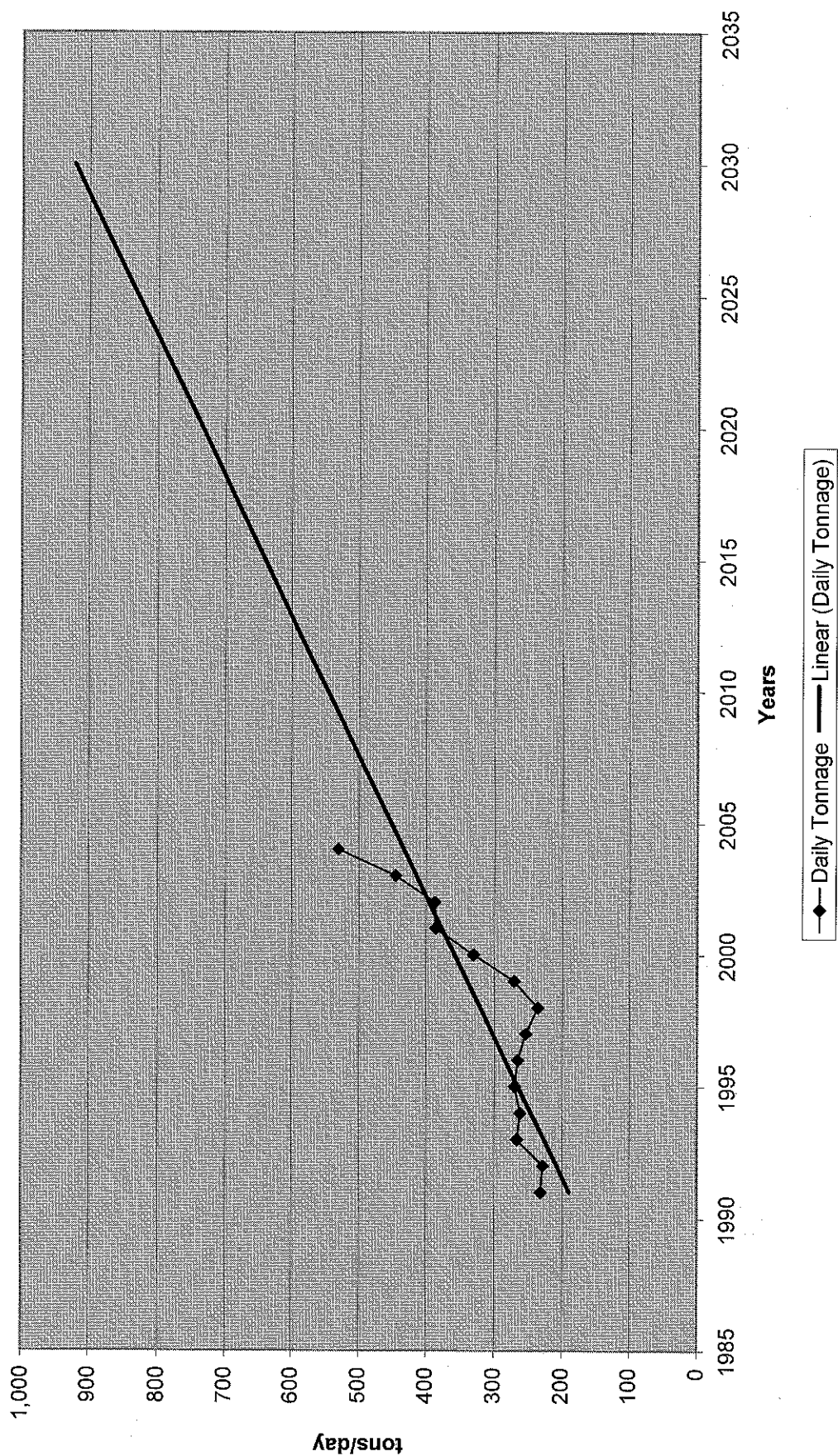
<sup>e</sup> Based on a rate of 200,000 tons/year (641 tons/day)

<sup>f</sup> Higher or Lower daily tonnage and/or waste placement density will alter the Life Estimate

<sup>g</sup> Based on the Current Proposed Expasnion Design as of February 2006.

## **APPENDIX H**

**Figure 2-3**  
**Daily Tonnage Projections**  
**(Using 1991 - 2004 Trend)**





## **APPENDIX I**

## **DEMOGRAPHIC TABLES**

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Updated 2/1/06

# POPULATION PROJECTIONS FOR 2000 AND 2010

Locality	1990	% Change	2000	% Change	2010
Caroline	19,217	15.1	22,121	13.5	25,099
King George	13,527	24.2	16,803	30.9	22,000
Spotsylvania	57,403	57.5	90,395	22.8	110,999
Stafford	61,236	51.0	92,446	34.1	123,998
<b>Fredericksburg</b>	19,027	1.3	19,279	28.1	24,703
RADCO	170,410	41.5	241,044	27.3	306,799

Source: Virginia Employment Commission

# POPULATION ESTIMATES FOR 1999-2004

Locality	1999 Final Estimate	2000 Census	2001 Final Estimate	2002 Final Estimate	2003 Final Estimate	2004 Provisional Estimate
Caroline	21,900	22,121	22,200	22,300	23,000	23,500
King George	16,600	16,803	17,000	17,600	18,200	19,100
Spotsylvania	88,200	90,395	97,500	103,100	107,700	112,000
Stafford	90,100	92,446	98,000	104,100	109,700	114,900
<b>Fredericksburg</b>	19,300	19,279	19,800	20,300	20,500	21,100
RADCO	236,100	241,044	254,500	267,400	279,000	290,600

Source Weldon Cooper, Center for Public Service, University of Virginia.

POPULATION CHANGES 1980-2000

LOCALITY	Change From 1980-1990				Change From 1990-2000				Change From 1980-2000	
	1980	1990	Number	Percent	1990	2000	Number	Percent	Number	Percent
Caroline	17,904	19,217	1,313	7.3%	19,217	22,121	2,904	15.1	4,217	23.6
King George	10,543	13,527	2,984	28.3%	13,527	16,803	3,276	24.2	6,260	59.4
Spotsylvania	34,435	57,397	22,962	66.7%	57,397	90,395	32,998	57.5	55,960	162.5
Stafford	40,470	62,255	21,755	53.8%	62,255	92,446	30,191	48.5	51,976	128.4
Fredericksburg	15,322	19,033	3,711	24.2%	19,033	19,279	246	1.3	3,957	25.8
Region	118,674	171,429	52,755	44.5%	171,429	241,044	69,615	40.6	122,370	103.11
Virginia	5,346,818	6,189,197	842,379	15.8%	6,189,197	7,078,515	889,318	14.4	1,731,697	32.4

Source: U.S. Census 1980, 1990, 2000

POPULATION BY SEX 1980-2000

LOCALITY	1980			1990			2000			2000 Percent by Sex	
	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female
Caroline	8,873	9,031	17,904	9,530	9,687	19,217	11,011	11,110	22,121	49.8%	50.2%
King George	5,289	5,254	10,543	6,761	6,766	13,527	8,443	8,360	16,803	50.2%	49.8%
Spotsylvania	17,104	17,331	34,435	28,478	28,925	57,403	44,532	45,863	90,395	49.3%	50.7%
Stafford	20,951	19,519	40,470	31,625	20,611	61,236	46,486	45,960	92,446	50.3%	49.7%
Fredericksburg	6,425	8,897	15,322	8,695	10,332	19,027	8,677	10,602	19,279	45.0%	55.0%
RADCO	58,642	60,032	118,674	85,089	85,321	170,410	119,149	121,895	241,044	49.4%	50.6%

RADCO	1980	1990	1980-1990 Number	Change Percent	2000	1990-2000 Number	Change Percent	1980-2000 Number	Change Percent
Male	58,642	85,089	26,447	45.1	119,149	34,060	40.0	60,507	103.2
Female	60,032	85,321	25,289	42.1	121,895	36,574	42.9	61,863	103.0
Total	118,674	170,410	51,736	43.6	241,044	70,634	41.5	122,370	103.1

Source: U. S. Census 1970, 1980, 1990, 2000.

**POPULATION CHANGE FACTORS AND MIGRATION TRENDS 1995-2000**

Locality	Births	Deaths	Natural Increase	Migration	Population Change 1995-2000	%Change Due To:	
						Natural Increase	Migration
Caroline	1,381	916	465	514	979	47%	53%
King George	1,148	550	598	554	1,152	52%	48%
Spotsylvania	5,417	2,176	3,241	14,906	18,147	18%	82%
Stafford	5,803	1,763	4,040	9,682	13,722	29%	71%
<b>Fredericksburg</b>	1,722	1,036	686	(2,626)	(1,940)	NA	NA
RADCO Region	15,471	6,442	9,029	23,030	32,059	28%	72%
Virginia	443,749	255,858	187,891	194,555	382,445	49%	51%

Source: Weldon Cooper Center, University of Virginia

**POPULATION AGE DISTRIBUTION 1980-2000**

Age	Year	Caroline		King George		Spotsylvania		Stafford		Fredericksburg		RADCO	
		Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent
<b>Under 5</b>	1980	1,339	7.5%	832	7.9%	3,112	9.0%	3,226	8.0%	760	5.0%	9,269	7.8%
	1990	1,431	7.4%	1,143	8.4%	5,050	8.8%	5,154	8.4%	1,264	6.6%	14,042	8.2%
	2000	1,381	6.2%	1,272	7.6%	6,879	7.6%	7,172	7.8%	1,127	5.8%	17,831	7.4%
<b>5-9</b>	1980	1,452	8.1%	902	8.6%	3,399	9.9%	3,656	9.0%	817	5.3%	10,226	8.6%
	1990	1,401	7.3%	1,071	7.9%	4,989	8.7%	5,161	8.4%	960	5.0%	13,582	8.0%
	2000	1,559	7.0%	1,313	7.8%	7,894	8.7%	8,559	9.3%	943	4.9%	20,268	8.4%
<b>10-18</b>	1980	3,135	17.5%	1,883	17.9%	6,043	17.6%	7,209	17.8%	2,035	13.3%	20,305	17.1%
	1990	2,452	12.8%	1,749	12.9%	8,200	14.3%	8,648	14.1%	1,825	9.6%	22,874	13.4%
<b>*10-14</b>	2000	1,602	7.2%	1,333	7.9%	8,008	8.9%	8,632	9.3%	867	4.5%	20,442	8.5%
<b>19-24</b>	1980	1,897	10.6%	902	8.6%	2,967	8.6%	4,240	10.5%	2,850	18.6%	12,856	10.8%
	1990	1,639	8.5%	1,152	8.5%	4,326	7.5%	6,032	9.9%	3,918	20.6%	17,067	10.0%
<b>*15-19</b>	2000	1,424	6.4%	1,181	7.0%	6,350	7.0%	6,974	7.5%	2,104	10.9%	18,033	7.5%
<b>*20-24</b>	2000	1,153	5.2%	949	5.6%	4,603	5.1%	5,027	5.4%	2,982	15.5%	14,714	6.1%
<b>25-34</b>	1980	2,741	15.3%	1,733	16.4%	6,614	19.2%	7,268	18.0%	2,261	14.8%	20,617	17.4%
	1990	3,287	17.1%	2,574	19.0%	10,802	18.8%	11,198	18.3%	3,393	17.8%	31,254	18.3%
	2000	2,915	13.2%	2,317	13.8%	12,552	13.9%	12,853	13.9%	2,856	14.8%	33,493	13.8%
<b>*35-59</b>	1980	4,785	26.7%	2,987	28.3%	8,852	25.7%	11,530	28.5%	3,597	23.5%	31,751	26.8%
	1990	5,853	30.5%	4,084	30.2%	18,019	31.4%	19,776	32.3%	4,371	23.0%	52,103	30.6%
<b>*35-44</b>	2000	3,696	16.7%	3,011	17.9%	16,510	18.3%	18,272	19.8%	2,385	12.4%	43,874	18.2%
<b>*45-54</b>	2000	3,188	14.4%	2,304	13.7%	12,846	14.2%	12,958	14.0%	2,138	11.1%	33,434	13.9%

Age	Year	Caroline		King George		Spotsylvania		Stafford		Fredericksburg		RADCO	
		Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent
<b>*55-59</b>	2000	1,318	6.0%	871	5.2%	4,184	4.6%	4,067	4.4%	791	4.1%	11,231	4.7%
<b>60-64</b>	1980	775	4.3%	429	4.1%	1,188	3.4%	1,112	2.7%	757	4.9%	4,261	3.6%
	1990	882	4.6%	492	3.6%	1,808	3.1%	1,640	2.7%	702	3.7%	5,524	3.2%
	2000	1,028	4.6%	642	3.8%	3,043	3.4%	2,458	2.7%	616	3.2%	7,787	3.2%
<b>*65 &amp; over</b>	1980	1,780	9.9%	875	8.3%	2,260	6.6%	2,229	5.5%	2,245	14.7%	9,389	7.9%
	1990	2,272	11.8%	1,262	9.3%	4,209	7.3%	3,627	5.9%	2,594	13.6%	13,964	8.2%
<b>*65-74</b>	2000	1,569	7.1%	885	5.3%	4,342	4.8%	3,256	3.5%	1,222	6.3%	11,274	4.7%
<b>*75-84</b>	2000	960	4.3%	541	3.2%	2,443	2.7%	1,670	1.8%	926	4.8%	6,540	2.7%
<b>*85 &amp; over</b>	2000	328	1.5%	184	1.1%	741	0.8%	548	0.6%	322	1.7%	2,123	0.9%
<b>TOTAL</b>	1980	17,904		10,543		34,435		40,470		15,322		118,674	
	1990	19,217		13,527		57,403		61,236		19,027		170,410	
	2000	22,121		16,803		90,395		92,446		19,279		241,044	

Note: Percentage totals may not add to 100 due to rounding

\*Adjustment of age cohorts due to 2000 census Source: U.S. Census 1980, 1990, 2000.



**MEDIAN AGE 1980-2000**

Locality	1980	1990	2000	Change 1980-90	Change 1990-00	Change 1980-00
Caroline	29.1	33.1	37.7	4.0	4.6	8.6
King George	29.4	31.0	35.1	1.6	4.1	5.7
Spotsylvania	27.8	30.9	34.3	3.1	3.4	6.5
Stafford	27.9	29.9	33.1	2.0	3.2	5.2
Fredericksburg	29.8	28.8	30.3	-1.0	1.5	.50
Virginia	29.8	32.6	35.7	2.8	3.1	5.9

Source: U.S. Census 1980, 1990, 2000

**RACIAL CHARACTERISTICS 1980-2000**

Locality Name	1980				1990				2000			
	White	Non-White	Total	Percent Non-White	White	Non-White	Total	Percent Non-White	White	Non-White	Total	Percent Non-White
Caroline	9,917	7,987	17,904	44.6%	11,686	7,531	19,217	39.2%	13,842	7,977	21,819	36.6
King George	8,044	2,499	10,543	23.7%	10,597	2,930	13,527	21.7%	13,055	3,485	16,540	21.1
Spotsylvania	29,013	5,422	34,435	15.7%	50,220	7,183	57,403	12.5%	74,924	13,772	88,696	15.5
Stafford	37,115	3,355	40,470	8.3%	55,546	5,690	61,236	9.3%	75,807	14,356	90,163	15.9
<b>Fredericksburg</b>	12,089	3,233	15,322	21.1%	14,468	4,559	19,027	24.0%	14,108	4,796	18,904	25.4
RADCO	96,178	22,496	118,674	19.0%	142,571	27,893	170,410	16.4%	191,736	44,386	236,122	19.0
Virginia	4,229,798	1,117,020	5,346,818	20.9%	4,791,739	1,395,619	6,187,358	22.6%	5,120,110	1,815,336	6,935,446	26.1

Source: U. S. Census 1980, 1990, 2000.

# **RACIAL COMPOSITION 1990 and 2000**

**1990**

	Caroline		King George		Spotsylvania		Stafford		Fredericksburg		Region	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent
White	11,686	60.8%	10,597	78.3%	50,220	87.5%	55,546	90.7%	14,468	76.0%	142,517	83.6%
Black	7,244	37.7%	2,734	20.2%	6,178	10.8%	4,304	7.0%	4,115	21.6%	24,575	14.4%
Am. Indian	203	1.1%	37	0.3%	197	0.3%	233	0.4%	27	0.1%	697	0.4%
Asian	49	0.3%	119	0.9%	607	1.1%	746	1.2%	205	1.1%	1,726	1.0%
Other	35	0.2%	40	0.3%	201	0.4%	407	0.7%	212	1.1%	895	0.5%
Total	19,217	100.0%	13,527	100.0%	57,403	100.0%	61,236	100.0%	19,027	100.0%	170,410	100.0%

**2000**

	Caroline		King George		Spotsylvania		Stafford		Fredericksburg		Region	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent	Number	Percent
White	13,842	62.6%	13,055	77.7%	74,924	82.9%	75,807	82.0%	14,108	73.2%	191,736	81.0%
Black	7,604	34.4%	3,148	18.7%	11,255	12.5%	11,211	12.1%	3,935	20.4%	37,153	16.0%
Am. Indian	172	0.8%	80	0.5%	288	0.3%	417	0.5%	65	0.3%	1,022	0.4%
Asian	79	0.4%	169	1.0%	1,243	1.4%	1,512	1.6%	291	1.5%	3,294	1.4%
Other	122	0.5%	88	0.5%	986	1.0%	1,216	1.3%	505	2.7%	2,917	1.2%
Total	21,819	98.7%	16,540	98.4%	88,696	98.1%	90,163	97.5%	18,904	98.1%	236,122	100.0%

Source: U. S. Census 1990, 2000.

# UNEMPLOYMENT RATES 1989-2004

Locality	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
Caroline	5.3	7.0	10.5	10.5	8.8	7.2	7.5	8.2	7.7	5.0	3.3	2.2	3.0	4.0	4.8	4.0
King George	3.6	4.6	6.5	7.6	5.4	4.0	4.4	4.1	3.4	2.5	1.9	1.6	2.0	2.6	2.8	2.9
Spotsylvania	4.4	5.8	8.8	7.8	4.5	3.7	3.5	3.2	2.9	1.8	1.6	1.3	1.6	2.2	2.4	2.6
Stafford	2.0	3.5	5.3	5.3	3.3	3.1	3.1	2.7	2.1	1.6	1.5	1.2	1.7	2.4	2.5	2.5
<b>Fredericksburg</b>	3.7	4.5	7.3	10.3	5.9	4.7	4.2	4.2	3.8	3.6	3.0	2.3	4.0	6.0	5.9	4.9
RADCO	3.4	4.8	7.2	7.4	4.7	3.9	3.9	3.6	3.1	2.2	1.8	1.4	2.0	2.8	3.7	2.9
Virginia	3.9	4.3	5.8	6.4	5.1	4.9	4.5	4.4	4.0	2.9	2.8	2.2	3.4	4.1	4.1	3.7

Source: Virginia Employment Commission.

## CIVILIAN LABOR FORCE

Locality	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
Caroline	10,408	10,279	9,946	10,097	10,124	10,537	10,758	11,453	12,060	10,903	11,530
King George	7,993	8,299	7,964	8,102	8,387	8,622	8,228	8,402	8,502	8,632	9,190
Spotsylvania	36,147	37,775	39,395	40,369	42,486	44,370	46,531	49,445	50,062	52,284	57,295
Stafford	39,093	40,998	41,793	42,677	44,577	46,531	46,773	49,773	50,441	52,799	52,915
<b>Fredericksburg</b>	10,979	11,440	10,234	10,436	9,638	9,511	9,734	10,151	10,434	10,410	11,010
RADCO	104,620	108,791	109,332	111,681	115,212	119,571	122,024	129,224	131,499	135,028	146,940

Source: Virginia Employment Commission

# **WORKFORCE BY OCCUPATION 1990-2000**

Occupation	Caroline		King George		Spotsylvania		Stafford		Fredericksburg		RADCO	
	1990	2000	1990	2000	1990	2000	1990	2000	1990	2000	1990	2000
Management, Professional & Related Occupations	1,639	2,493	2,423	2,986	8,709	15,916	9,991	18,724	3,124	3,648	25,886	43,767
Service Occupations	1,254	1,620	734	967	3,287	6,094	3,724	6,071	1,397	1,707	10,396	16,459
Sales and Office Occupations	2,389	2,897	1377	1,911	8,139	12,552	8,387	11,725	2,614	2,621	22,906	31,706
Farming, Fishing and Forestry Occupations	290	77	168	70	452	81	263	56	113	10	1,286	294
Construction, Extraction, and Maintenance Occupations	1,285	1,432	533	891	2,933	5,431	2,188	5,353	818	857	7,757	13,964
Production, Transportation, and Material Moving Occupations	2,198	1,965	1368	1,026	5959	5,577	5,887	3,659	1,563	923	16,975	13,150
TOTAL	9,055	10,484	6,603	7,851	29,479	45,651	30,440	45,588	9,629	9,766	85,206	119,340

Source: U.S. Census: 1990, 2000

**WORKFORCE OVERVIEW PERSONS 16 YEARS AND OLDER 2000**

Locality	Employed	Unemployed	Civilian Labor Force	Percent Unemployed	Armed Forces	Not in Labor Force	Persons 16 & Older	Civilian Labor Force Participation Rate
Caroline								
Male	5,680	223	5,903	3.8%	54	2,578	8,535	69.2%
Female	4,804	256	5,060	5.1%	8	3,664	8,732	57.9%
Total	10,484	479	10,963	4.4%	62	6,242	17,267	63.5%
King George								
Male	4,434	141	4,575	3.1%	440	1,329	6,344	72.1%
Female	3,417	204	3,621	5.6%	87	2,580	6,288	57.6%
Total	7,851	345	8,196	4.2%	527	3,909	12,632	64.9%
Spotsylvania								
Male	24,331	748	25,079	3.0%	537	6,232	31,848	78.7%
Female	21,320	753	22,073	3.4%	58	12,159	34,290	64.4%
Total	45,651	1,501	47,152	3.2%	595	18,391	66,138	71.3%
Stafford								
Male	24,283	614	24,897	2.5%	3,124	5,205	33,226	75.2%
Female	21,305	773	22,078	3.5%	325	10,730	33,133	66.8%
Total	45,588	1,387	46,975	3.0%	3,449	15,935	66,359	70.8%
Fredericksburg								
Male	5,010	389	5,399	7.2%	87	1,657	7,143	75.6%
Female	4,756	646	5,402	12.0%	18	3,594	9,014	59.9%
Total	9,766	1,035	10,801	9.6%	105	5,251	16,157	66.9%

**CHARACTERISTICS OF THE UNEMPLOYED**  
**December 2005, Claimants Only**

Locality	Claimants	Female Number	Percent	Male Number	Percent	Non-White Number	Percent	Age Groups With Greatest Number Employed
Caroline	142	70	49.3%	72	50.7%	90	63.4%	45-54
King George	76	36	47.4%	40	52.6%	37	48.7%	45-54
Spotsylvania	281	125	44.5%	156	55.5%	98	34.9%	35-44
Stafford	262	124	47.3%	138	52.7%	96	36.6%	35-44
<b>Fredericksburg</b>	183	99	53.1%	86	46.9%	88	48.1%	35-44
<b>RADCO</b>	944	454	48.1%	490	51.9%	409	43.3%	35-44

# AVERAGE EMPLOYMENT BY INDUSTRY

SECTOR	CAROLINE	KING GEORGE	SPOTSYLVANIA	STAFFORD	FREDERICKSBURG	RADCO
Agricultural, Forestry, & Fisheries	78	130	23	22	*	256
Mining & Quarrying	*	*	*	*	*	17
Construction	484	395	3,781	3,500	805	9,024
Manufacturing	348	132	2,038	534	524	3,577
Transportation, Communications & Utilities	325	121	1,495	559	167	2,667
Trade	677	541	7,073	5,724	4,708	18,722
Finance, Insurance & Real Estate	252	152	1,241	726	1,288	7,564
Services	1,099	3,484	7,168	8,944	13,833	34,528
Government	1,524	4,474	5,061	5,322	3,638	20,018
TOTAL	4,954	9,867	28,159	29,598	25,680	98,259

\* Not Disclosed

Source: Virginia Employment Commission "Covered Employment & Wages" for quarter ending March 31, 2005  
Data withheld, but included in totals.

Note: Totals may not add due to rounding in original source and non-classifiable employment.



**AVERAGE WEEKLY WAGE PER EMPLOYEE  
FOR QUARTER ENDING MARCH 2005 BY PLACE OF WORK**

Industry	Caroline	King George	Spotsylvania	Stafford	Fredericksburg	RADCO
Agric, Forestry Fisheries	477	461	482	307	*	462
Mining & Quarrying	*	*	*	*	*	878
Construction	559	537	745	652	661	682
Manufacturing	631	469	753	628	623	693
Transportation & Communication	544	634	626	586	745	616
Trade	418	424	513	544	448	609
Finance Insurance Real Estate	748	527	848	559	925	919
Services	390	986	484	507	535	558
Government	638	1,206	617	623	670	761
All Industries	555	1,016	596	634	579	643

\* Not Disclosed

Source: Covered Employment and Wages in Virginia  
Quarter Ending March 31, 2005

**MEDIAN FAMILY INCOME 1980-2000**

LOCALITY	1980		1990		2000		Percent Change 1980-1990	Percent Change 1990-2000	Percent Change 1980-2000
	Median Family Income	% Family Income of Virginia	Median Family Income	% Family Income of Virginia	Median Family Income	% Family Income of Virginia			
Caroline	16,414	82.0%	32,245	84.4%	45,533	80.4%	96.4%	35.0%	165.2%
King George	20,632	103.1%	38,210	100.0%	55,160	101.8%	85.2%	44.4%	167.3%
Spotsylvania	20,600	102.9%	43,596	114.1%	62,422	115.2%	111.6%	43.2%	203.0%
Stafford	22,927	114.5%	47,526	124.4%	71,575	132.1%	107.3%	50.6%	212.2%
Fredericksburg	14,262	71.2%	33,353	87.3%	47,148	87%	133.9%	32.4%	230.6%
Virginia	20,018	100.0%	38,213	100.0%	54,169	100.0%	90.9%	41.7%	170.6%

Source: U. S. Census, 1980, 1990, 2000

PER CAPITA INCOME 1980-2000

LOCALITY	1980		1990		2000		CHANGES FROM 1980-2000		
	Per Capita Income	% Per Capita Income of Virginia	Per Capita Income	% Per Capita Income of Virginia	Per Capita Income	% Per Capita Income of Virginia	Percent Change 1980-1990	Percent Change 1990-2000	Percent Change 1980-2000
Caroline	5,431	72.6%	11,837	75.3%	18,342	76.5%	118.0%	55.0%	237.7%
King George	6,720	89.9%	15,365	97.8%	21,562	89.9%	128.6%	40.3%	220.9%
Spotsylvania	6,703	89.6%	15,192	96.7%	22,536	94.0%	126.6%	48.3%	236.2%
Stafford	7,321	97.9%	15,917	101.3%	24,762	103.3%	117.4%	55.6%	238.2%
<b>Fredericksburg</b>	7,089	94.8%	13,825	88.0%	21,527	89.8%	95.0%	55.7%	203.7%
RADCO	6,653	89.0%	14,427	91.8%	21,746	90.7%	116.9%	50.7%	226.9%
Virginia	7,478	100.0%	15,713	100.0%	23,975	100.0%	110.1%	52.6%	220.6%

Source: U. S. Census 1980, 1990, 2000

# RESIDENTIAL BUILDING PERMITS 1990-2004

AREA	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	Total
Caroline	250	210	197	175	160	164	196	203	199	180	157	236	375	469	638	3,809
King George	204	161	261	146	105	106	161	184	208	209	164	245	322	455	471	3,402
Spotsylvania	1,041	1,346	1,051	1,169	1,237	1,123	1,204	1,196	1,548	1,510	1,514	1,919	1,575	1,539	1,368	20,340
Stafford	1,203	806	1,115	1,614	1,318	1,167	1,450	1,216	1,118	1,272	1,969	1,553	2,096	1,562	2,041	21,500
Fredericksburg	94	13	21	6	49	36	14	155	30	228	40	72	103	46	170	1,077
RADCO	2,792	2,536	2,645	3,110	2,869	2,596	3,025	2,954	3,103	3,399	3,844	4,025	4,471	4,071	4,688	50,128

Source: Virginia Statistical Abstract 1990, 1991 1992, 1993, 1994, 1995, 1996, 1997, 1998, 1999  
RADCO 2000, 2001, 2002, 2003, 2004

# **RESIDENCE**

	Caroline	King George	Spotsylvania	Stafford	Fredericksburg
Persons 5 yrs. and over	20,774	15,607	83,753	85,426	18,186
Lived in same house	13,984 (67.3%)	8,905 (57.1%)	44,716 (53.4%)	42,850 (50.2%)	7,176 (39.5%)
Lived in different house in U.S.					
Same State	6,790	6,702	39,037	42,576	11,010
Same County	3,000	2,192	15,977	15,354	5,545
Different County	2,610	2,098	12,708	11,500	2,400
Different State	4,069	4,324	25,347	29,196	8,175
	1,069	2,132	9,370	13,842	2,630
Lived Abroad (incl. Puerto Rico)	111	280	982	1,880	435

Source: U. S. Census 2000

# HOUSING CHARACTERISTICS 1990-2000

Locality	Total Housing Units	Owner Occupied	Percent Owner Occupied	Renter Occupied	Vacant	Median Value Owner-Occupied Housing Units	Median Contract Rent Renter-Occupied Housing Units	Complete Plumbing Facilities	Lacking Complete Plumbing Facilities
Caroline									
1990	7,292	5,303	72.7%	1,328	661	64,200	287	6,781	511
2000	8,889	6,571	81.9%	1,450	868	88,900	587	8,692	197
King George									
1990	5,280	3,298	62.5%	1,438	544	89,400	381	5,119	161
2000	6,820	4,376	71.8%	1,715	729	123,200	622	6,776	44
Spotsylvania									
1990	20,483	15,516	75.8%	3,429	1,538	104,000	565	20,158	325
2000	33,329	25,735	82.1%	5,573	2,021	128,500	805	33,161	168
Stafford									
1990	20,529	15,901	77.5%	3,514	1,114	125,400	536	20,241	288
2000	31,405	24,322	80.6%	5,865	1,218	156,400	842	31,334	71
Fredericksburg									
1990	8,063	2,779	34.5%	4,671	613	104,900	461	8,029	34
2000	8,888	2,882	35.6%	5,220	786	135,800	651	8,873	15
RADCO									
1990	61,647	42,797	69.4%	14,380	4,470	*	*	60,328	1,319
2000	89,331	63,886	76.3%	19,823	5,622	*	*	88,836	495

\* Data Not Available, Source: U.S. Census, 1990, 2000

# **EDUCATIONAL ATTAINMENT 2000**

Educational Level	Caroline	King George	Spotsylvania	Stafford	Fredericksburg	RADCO
Total Persons 25 years & older	15,082	10,803	56,633	56,029	11,211	149,758
Less than 9th grade	1,289	730	2,522	1,782	715	7,038
Grade 9 to 12 No diploma	3,032	1,389	6,665	4,597	1,504	17,187
High School Graduate	5,685	3,496	17,882	15,663	3,086	45,812
Some College, No Degree	1,554	2,212	13,421	13,218	2,025	33,658
Associate Degree	473	425	3,215	4,163	458	8,734
Bachelor's Degree	1228	1,680	9,059	10,550	2,011	24,528
Graduate or Professional Degree	593	871	3,869	6,056	1,412	12,801
% High School Graduate or higher	71.3	80.4	83.8	88.6	80.2	83.8
% Bachelor's Degree or higher	12.1	23.6	22.8	29.6	30.5	24.9

Source: U.S. Census 2000

NUMBER OF REGISTERED DEALERS AND TOTAL TAXABLE SALES 2004

CATEGORY	CAROLINE		KING GEORGE		SPOTSYLVANIA		STAFFORD		FREDERICKSBURG		RADCO	
	Dealers	Taxable Sales	Dealers	Taxable Sales	Dealers	Taxable Sales	Dealers	Taxable Sales	Dealers	Taxable Sales	Dealers	Taxable Sales
Apparel	10	\$13,749	0	0	87	\$38,207,459	36	\$28,144,936	63	\$71,040,398	196	\$137,406,542
Automotive	47	\$9,221,177	33	\$13,188,688	146	\$119,936,222	167	\$38,797,750	63	\$31,753,972	456	\$212,897,809
Food	85	\$52,648,159	57	\$51,657,599	261	\$280,720,659	231	\$248,307,575	235	\$199,427,478	869	\$832,761,470
Furniture	17	\$731,355	9	\$1,986,235	106	\$125,235,394	71	\$56,414,693	56	\$81,043,730	259	\$265,411,407
General Merchandise	31	\$7,126,518	14	\$1,467,466	97	\$138,415,513	96	\$144,545,473	58	\$36,944,628	296	\$328,499,598
Lumber	15	\$6,205,144	0	\$0	62	\$171,021,243	42	\$96,111,833	36	\$83,156,717	155	\$356,494,937
Fuel	0	\$0	0	\$0	7	\$7,864,965	0	\$0	0	0	7	\$7,864,965
Machinery	21	\$2,815,884	9	\$584,184	94	\$37,186,831	76	\$58,205,343	72	\$24,313,386	272	\$123,105,628
Hotels/Motels	8	\$3,768,902	5	\$1,472,192	22	\$12,428,671	20	\$15,967,740	16	\$16,297,330	71	\$49,934,835
Miscellaneous Group & Unidentifiable	214	\$15,183,260	154	\$15,877,593	663	\$210,221,764	598	\$111,710,539	642	\$499,833,542	2,271	\$852,826,698
Alcoholic Beverage	1	\$429,327	1	\$400,771	4	\$5,527,369	2	\$3,830,308	3	\$3,762,384	11	\$13,950,159
TOTAL	449	\$98,143,475	282	\$86,634,728	1,549	\$1,146,766,090	1,339	\$802,036,190	1,244	\$1,047,573,565	4,863	\$3,181,154,048

Source: Taxable Sales in Virginia Counties & Cities, Annual Report 2004

Updated 2/1/06