

## Environmental

- I. [Executive Summary](#)
- II. [Methodology](#)
- III. [Middle Georgia Metropolitan Statistical Area](#)
- IV. [Water](#)
  - a. [Water Pollution](#)
  - b. [Land and Water Area](#)
- V. [Air Quality](#)
  - a. [Brief History of Air Quality Issues](#)
  - b. [Fall Line Air Quality Study](#)
  - c. [Current Issues in Air Quality](#)
  - d. [Current Conditions](#)
- VI. [Greenspace Program](#)
  - a. [Summary](#)
  - b. [Program Eligibility](#)
  - c. [County-by-County Description](#)
    - i. [Bibb County](#)
    - ii. [Crawford County](#)
    - iii. [Houston County](#)
    - iv. [Monroe County](#)
- VII. [Underdeveloped Land and Natural Resources](#)
  - a. [Open Water](#)
  - b. [Clearcut/Young Pine](#)
  - c. [Pasture](#)
  - d. [Cultivated/Exposed Earth](#)
  - e. [Low Density Urban](#)
  - f. [High Density Urban](#)
  - g. [Emergent Wetland](#)
  - h. [Scrub/Shrub Wetland](#)
  - i. [Forested Wetland](#)
  - j. [Coniferous Forest](#)
  - k. [Mixed Forest](#)
  - l. [Hardwood Forest](#)
- VIII. [Endangered Species](#)
- IX. [Brownfield Sites](#)
- X. [Landfills](#)
- XI. [Historic Places](#)
- XII. [Conclusion](#)

## **Executive Summary**

The Middle Georgia RDC conducted an Environmental Review focusing on a seven-county area surrounding Robins Air Force Base in Warner Robins, Georgia. The seven counties included in this report are Bibb, Crawford, Houston, Jones, Monroe, Peach, and Twiggs. These counties were either in the old Macon MSA prior to June 2003 (Bibb, Houston, Jones, Twiggs, Peach) or are in the new Macon or Warner Robins MSAs (Bibb, Crawford, Jones, Monroe, Twiggs in the former – Houston in the latter).

With the importance of environmental analysis becoming a mainstream reality, an increased understanding of the interrelationships of plants, animals, water sources, and air quality is essential toward determining the effect of human development and mobility on our environment. Any amount of development, whether commercial or industrial, must be considered based upon the effect it may or may not have on the environment. Due to environmental concerns and the changes which occur with development, it is important to identify changes that may or may not have unintended consequences. Furthermore, with the rise of environmental consciousness, information about environmental impacts on land use is beneficial when determining the future use of land, water and air in communities. The following report identifies current environmental conditions in middle Georgia and determines what communities are undertaking to address any potential environmental impact of the Middle Georgia community.

As part of the Georgia Planning Act, several sets of rules were developed to guide the overall planning process. Environmental Planning Criteria, which were established by the Department of Natural Resources (DNR), are used to protect and conserve critical environmental resources. The DNR uses the criteria of water supply watersheds, groundwater, wetlands, protected rivers, and protected mountains to protect these critical resources. Each of these aspects, along with other environmental issues such as water quality, air quality, Greenspace, undeveloped land and natural resources, endangered species, Brownfield sites, and landfill space are addressed within this report. However, there are no protected mountains within the Middle Georgia area.

## **Methodology**

This report was prepared to evaluate the Middle Georgia area based on certain environmental factors such as air quality, water quality, the Georgia Greenspace Program, undeveloped land, natural resources, endangered species, water area, land area, Brownfield sites, and landfill space. The area of study includes a seven-county area surrounding Robins Air Force Base in Houston County. Information sources used for this study include, but are not limited to, information from city, county, state, and federal sources.

## **Middle Georgia Metropolitan Statistical Area Environmental Briefing**

Prior to June 6, 2003, the only MSA within the Middle Georgia region was the Macon MSA. This area was defined to include the counties of Bibb, Houston, Peach, Twiggs, and Jones. In June 2003, the US Census Bureau redefined the Macon MSA, adding Crawford and Monroe Counties while removing Peach and Houston Counties. Peach County was reclassified into the Fort Valley Micropolitan Statistical Area while a new Warner Robins MSA was created from Houston County. Following this change, the number of MSAs in Middle Georgia increased from one to two.

Where references are made to the Macon MSA, unless otherwise stated, the project area defined is the former Macon MSA, consisting of Bibb, Houston, Monroe, Peach, and Twiggs Counties. Currently, the environmental implications on particular counties due to the changes in the MSAs are being discussed by the Georgia Environmental Protection Division (EPD) and the United States Environmental Protection Agency (EPA).

## **Water**

The area relies upon both surface water (rivers, lakes, and other water bodies on Earth's surface) and ground water (wells). The three major rivers (Flint, Oconee, and Ocmulgee) in the district are a good source of surface water capacity for those communities north of the Fall Line. The Fall Line bisects the district from east to west, separating the Piedmont from the Coastal Plain. The land north of the Fall Line sits on crystalline rock formations and has limited groundwater resources, causing the communities in this area to rely primarily on surface water sources. Lands in the Fall Line Hills and to the south of the Fall Line (in the Coastal Plain) have abundant groundwater because they are located above the Cretaceous and Floridian aquifer systems. Bibb and Monroe counties and the cities of Macon, Eatonton, Forsyth, and Milledgeville all primarily use surface water sources. The 2002-2007 Comprehensive Economic Development Strategy, prepared by the Middle Georgia RDC, states that all other governments with public water systems in Middle Georgia primarily rely on groundwater sources.

### Middle Georgia Water Withdrawal, 2000

County	Total Water Withdrawal in Million Gallons Per Day	Ground Water Withdrawal	Surface Water Withdrawal
<b>Houston</b>	29.93	28.83	1.10
<b>Bibb</b>	153.64	4.61	149.03
<b>Crawford</b>	6.06	4.55	1.51
<b>Jones</b>	2.47	2.37	0.10
<b>Monroe</b>	125.71	3.48	122.23
<b>Peach</b>	13.18	12.27	0.91
<b>Twiggs</b>	19.66	19.34	0.32

*Source: 2003 Georgia County Guide*

Within this table, an anomaly exists showing that Bibb and Monroe Counties have significantly higher water withdrawal levels than the surrounding counties. Although Monroe is approximately one-fifth the size of Houston County, water withdrawals in Monroe County are four times higher than those in Houston County. The increased water withdrawal amounts in Bibb and Monroe Counties are due to coal-burning power plants located within their boundaries. The primary uses for these facilities can be determined to be surface water. Throughout the remaining counties examined within this report, the primary source of water withdrawal is ground water.

When evaluating surface water withdrawal in Middle Georgia, nine surface water withdrawal facilities are located within the area examined for this report. Five facilities are privately owned by industries, while four are municipal facilities. Of the industrial facilities, five are owned and operated by the Georgia Power Company. The municipal facilities are all operated either by Jones, Bibb, or Monroe County. Additionally, all facilities obtain their water from sources located within the Ocmulgee River Basin.

In total, these nine facilities have a permitted monthly average of 802.16 million gallons per day (MGD). During 2001, these facilities only utilized 205.48 MGD of surface water withdrawals. The overall result is a reserve of 595.68 MGD, which is an astounding 74 percent of the total permitted amount (see table on the following page).

### Surface Water Withdrawal Facilities Within Middle Georgia, 2001

Municipal or Industrial	Facility Name	County	Source Water	Permitted Monthly Average (MGD)	2001 Actual Annual Average (MGD)	Reserve (MGD)	Percent Reserve Remaining
Industrial	Bibb Company - Plant Camellia	Bibb	Ocmulgee River	3.66	0.03	3.63	99%
Industrial	Riverwood International, Inc.	Bibb	Ocmulgee River	16.00	11.60	4.40	28%
Industrial	Georgia Power Co - Arkwright	Bibb	Ocmulgee River	260.00	54.30	205.70	79%
Municipal	Macon-Bibb County Water & Sewer Auth	Bibb	Ocmulgee River	110.00	29.86	80.14	73%
Industrial	Georgia Power Company - Plant Scherer	Monroe	Lake Juliette	115.00	59.37	55.63	48%
Industrial	Georgia Power Co - Plant Scherer	Monroe	Ocmulgee River	231.00	21.21	209.79	91%
Municipal	Forsyth, City of - Tobesofkee	Monroe	Tobesofkee Creek	2.00	1.27	0.73	37%
Municipal	Forsyth, City of - Rocky	Monroe	Rocky Creek	1.50	0.74	0.76	51%
Municipal	Macon-Bibb County Water & Sewer Auth	Jones	Town Creek Reservoir	63.00	28.10	34.90	55%
<b>Region Totals</b>				<b>802.16</b>	<b>206.48</b>	<b>595.68</b>	<b>74%</b>

*Source: 2002-2007 Comprehensive Economic Development Strategy: For the Middle Georgia Region*

As evidenced by the table above, in total, the water withdrawal facilities within Middle Georgia have a large reserve capacity remaining, resulting in an abundance of available water within the Middle Georgia region. Further, Middle Georgia communities and industries often have source water options, with both ground water and surface water sources available.

#### **Water Pollution**

Pollution occurs within the streams and waterways of Middle Georgia just as it does in other parts of the United States. Streams polluted by non-point source pollutants (agriculture, run-off, etc.) are listed on the Georgia EPD's 305(b) report. The 305(b) report lists all streams within the State of Georgia which do not meet the standards of the

Federal Clean Water Act. This report separates streams into two categories: those that do not support their designated uses and those that partially support their designated uses. If a stream is included on a 305(b) list then the EPD recommends an environmental and designation assessment of the stream, in order to determine whether or not the stream's environmental status matches its designated use.

Remediation efforts are ongoing within these streams, which include Total Maximum Daily Load (TMDL) studies as well as 604(b) efforts. TMDL implementation plans are a summation of measures which local governments can voluntarily take in order to decrease pollution in their waterways, while 604(b) efforts focus on non-point source pollutants. The primary pollutants identified in these reports include sediment and fecal coliform.

There are six streams within the geographic area of this report that do not currently support their designated use according to Georgia EPD. The Middle Georgia RDC has created Total Maximum Daily Load (TMDL) assessments of each of these streams and their surrounding stream clusters to identify what the potential sources of contamination are for these bodies of water. It is up to the local government to determine what actions must be taken to address the stream quality issues in their respective communities. Additionally, 34 stream segments are partially supporting of their designated use.

Over and above the TMDL efforts, the Middle Georgia RDC has conducted one stream analysis to further determine what contaminants are affecting local bodies of water. This process consisted of examination of aerial photography, an aerial flyover, walking the stream bank, and interviewing individuals with additional knowledge of the stream segment in question. During the current fiscal year, the Middle Georgia RDC will undertake stream analysis of the segment of Tobesofkee Creek between Cole Creek and Todd Creek.

### ***Land and Water Area***

In addition to assessing the water quality issues stated above, a snapshot evaluation of the counties within the region shows the relationship of land to water areas within the area. The total area within each of the counties is determined by adding the land surface area and the water surface area to derive the total county area. However, due to rounding of each of these categories in the 2003 Georgia County Guide, some of the total county areas are one-tenth of a square mile less than the sum of the land and water surface areas.

Interestingly, the average water surface area within the State of Georgia is 9.55 square miles per county. Within Middle Georgia, this figure is considerably lower than the State average. However, the land surface area of the area is consistent with statewide averages for area of counties. While the amount of land and water surface areas do not have direct correlations to environmental issues, it presents an interesting dynamic in that the water surface area in Middle Georgia is considerably lower than the State average.

**Middle Georgia Counties' Land & Water Surface Areas  
(in square miles)**

	<b>Total County Area</b>	<b>Land Surface Area</b>	<b>Water Surface Area</b>
<b>Houston</b>	379.8	376.8	3.1
<b>Bibb</b>	255.1	250.0	5.2
<b>Crawford</b>	326.5	325.0	1.4
<b>Jones</b>	395.4	393.7	1.6
<b>Monroe</b>	397.8	395.6	2.2
<b>Peach</b>	151.5	151.1	0.4
<b>Twiggs</b>	362.9	360.3	2.7

*Source: 2003 Georgia County Guide*

**Air Quality**

***Brief History of Air Quality Issue***

In early 1999, the Georgia Environmental Protection Division (EPD) informed leaders in the metropolitan areas of Augusta, Columbus, and Macon that their air would, in all likelihood, not meet the United States Environmental Protection Agency's new national ambient air quality standard for ground level ozone: 0.085 parts per million as averaged over an eight-hour period. This information led each city to form a task force to address local air quality issues.

The following summer, members from each city's task force approached the School of Earth and Atmospheric Sciences at Georgia Tech. This action by each city led to an informal alliance, sending a message to state legislators that their collective air quality problem was a major concern for the state. Furthermore, it was the goal of this alliance to communicate that by working as a group with the State of Georgia, these difficult air quality issues could be addressed.

In October 1999, a delegation from the three cities and Georgia Tech met with Governor Roy Barnes to request funding for the proposed study. With favorable reviews from the EPD and the Georgia Regional Transportation Authority, the General Assembly and the Governor included funds for the study in the FY 2000 supplemental budget.

As part of this effort, a team of Georgia Tech researchers in the School of Earth and Atmospheric Sciences and the School of Civil and Environmental Engineering in the summer of 2000 embarked on the pilot phase of a three-year, \$3 million study that aims to assess urban and regional air pollution in the Augusta, Columbus and Macon metropolitan areas. The study's unique, early intervention approach will attempt to address the cities' problems before they become unmanageable. A reference article at <http://www.whistle.gatech.edu/archives/00/aug/07/> can be accessed to provide further insight into the intervention approach.

***Fall Line Air Quality Study***

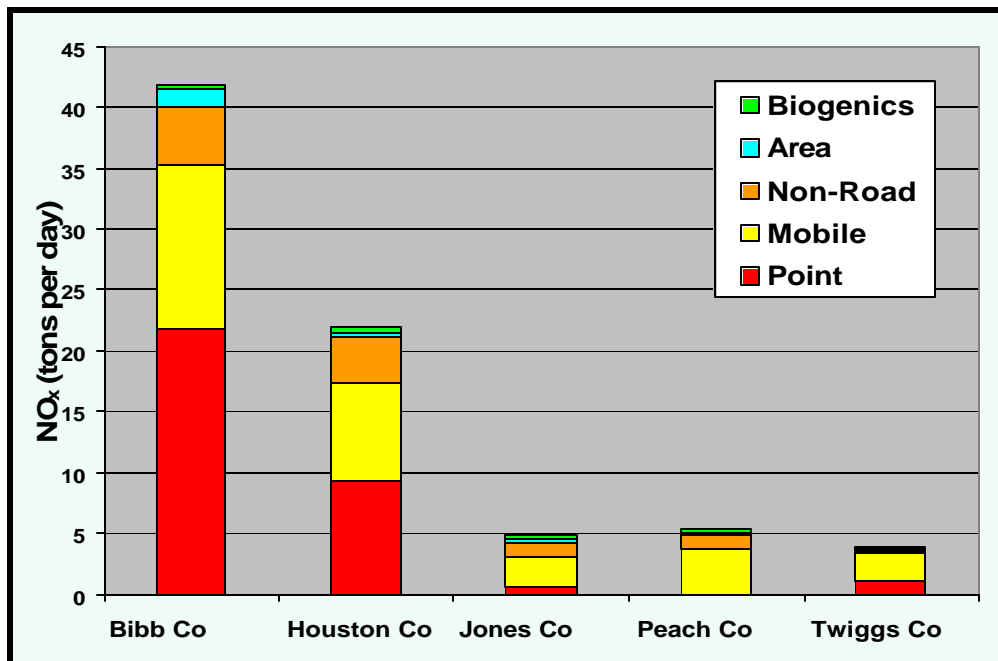
The Fall Line Air Quality Study (FAQS) deals with Ground-Level Ozone Formation and the three areas that contribute to this formation. Volatile Organic Compounds (VOCs) and Nitrogen Oxides (NOx) create Ozone Smog. VOCs are items such as fuels, paints,

solvents, and vegetation. VOC sources called Anthropogenic or human based sources, such as cars, gasoline stations, solvents, tobacco curing, and paper manufacturing, are sources for these types of pollutants. However, the largest point of pollution through this source is biogenic or natural sources, such as vegetation, and, therefore, presents feasibility issues when trying to identify a proper approach to eliminate pollutants from VOC and NOx sources.

NOx is created through combustible processes such as fuel burning. Seventy-eight tons of pollutants per day are created through these sources in Middle Georgia. In the FAQs, potential sources are identified as non-road, mobile, point, biogenic and area. Information provided in the FAQs indicates that the point source of pollution is an area in which guidelines can be imposed and reduce the amount of pollution being generated in the Macon MSA.

When examining the Macon MSA counties individually, sources of pollution by county are easily identifiable (See Figure 1). Figure 1 identifies Bibb and Houston Counties as major sources for NOx. Point sources for pollution through NOx emissions include Brown and Williamson, Anchor Glass, Armstrong, Medusa Cement, Riverwood International, and the Georgia Power Arkwright plant. One point of note, the Georgia Power Arkwright plant is no longer in operation. How this affects the current air quality is yet to be determined. Furthermore, with the Brown and Williamson merger and the subsequent plant closing, the amounts contributed by the plant could differ depending on what type of industry moves into the facility. Other counties identified in the FAQs include Jones, Peach, and Twiggs, all of which are low sources of point pollution.

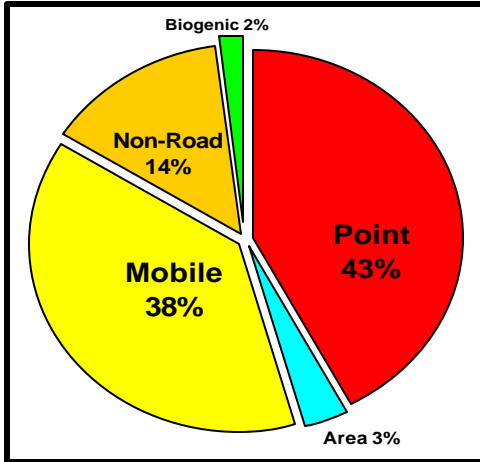
**NOx Sources by County (2000)**



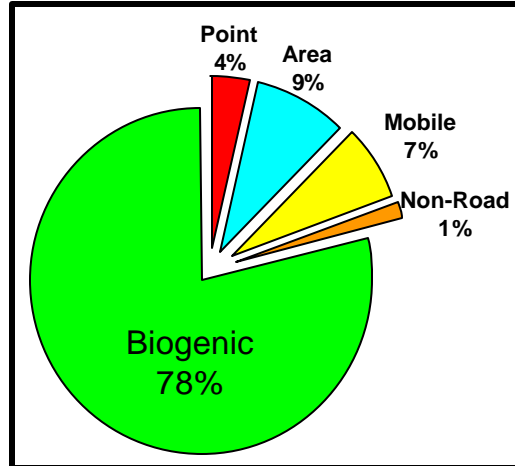
Source: GA Tech Fall Line Air Quality Study

Other areas identified in the FAQS as problem areas for both VOCs and NOx are identified in Figures 2 and 3 below.

**NOx Sources in Macon MSA (2000)**



**VOC Sources in Macon MSA (2000)**



The process of gathering data during this process began with a survey tool in the FAQS. An emissions inventory was conducted by scientists and engineers at Georgia Tech, along with the Georgia Department of Natural Resources [http://cure.eas.gatech.edu/faqs/emissions\\_survey/survey.zip](http://cure.eas.gatech.edu/faqs/emissions_survey/survey.zip) which gathered emissions information from companies throughout the region. This information was then analyzed in an Emissions Calculation Table which examined emissions generating processes such as process fuel burning, process evaporation, miscellaneous processes and stack devices. The results of this survey can be found by selecting the link above. The official website for FAQS can be accessed at <http://cure.eas.gatech.edu/faqs/> on the Internet.

### ***Current Issues in Air Quality***

Issues surrounding air quality standards in the Macon MSA are currently being addressed by both the EPD and the EPA. These standards are defined by The Clean Air Act, last amended in 1990, which established two types of national air quality standards. *Primary standards* establish limits to protect public health which include the health of "sensitive" populations such as asthmatics, children, and the elderly. *Secondary standards* establish limits to protect public welfare that include protection against decreased visibility, damage to animals, crops, vegetation, and buildings ([http://www.epa.gov/oar/oaq\\_caa.html](http://www.epa.gov/oar/oaq_caa.html)).

### ***Current Conditions***

On July 15, 2003, Georgia EPD recommended only Bibb County be designated in non-attainment for new ozone standards. In December of 2003, the EPA informed EPD of the intent to designate Bibb, Houston and Monroe counties as non-attainment communities. The decision to designate these areas in the new MSA was made using data from the Summer/Fall 2003 season. Currently, the issue of non-attainment is still being debated

between the EPD and EPA. On February 6, 2004, the EPD is scheduled to respond to the recommendations of EPA regarding the attainment status of the new Macon MSA, which includes Monroe, Jones, Bibb, Crawford, and Twiggs Counties. On April 15, 2004 the EPA will make a final designation decision for ozone and air quality standards.

One major issue surrounds the National Ambient Air Quality Standards (NAAQS) which, through 2001-2003, Bibb County exceeded NAAQS for ozone and particulate matter. In September of 1997, the EPA finalized new public health standards for two common air pollutants -- ozone and particulate matter. It was the first update in 20 years for the smog standard, and the first in 10 years for soot. Since the Clean Air Act's inception in 1970, the EPA has been required to set NAAQS for the six most common air pollutants. These standards are set at levels which are to protect public health with an adequate margin of safety and without consideration of cost. These standards have two important purposes. They provide information to the public about whether the air in their community is healthy; they also present state and local governments with the targets they must meet to achieve clean air. The NAAQS has three parts: the concentration or level, the measurement period, and the "form" of the standard. The new standard is set at a concentration of 0.08 parts per million (ppm). The measurement period is eight hours. Under the form adopted by EPA, areas are allowed to disregard their three worst measurements every year and average performance over three years to determine if they meet the standard.

The major implications of this action will focus on the implementation of stricter air quality permitting for large industrial sources. A review of area transportation plans and some existing businesses may lead to the installation of retrofit air pollution controls. Currently, the EPD is developing a plan for attainment. However, the details of this plan have not been released making any type of strategy to address the EPA's findings difficult.

Documentation of the Old Clean Air Standards which were replaced by NAAQS can be found at [http://www.epa.gov/ttn/oarpg/t1/fact\\_sheets/o3fact.pdf](http://www.epa.gov/ttn/oarpg/t1/fact_sheets/o3fact.pdf). The new NAAQS standards can be found at <http://www.epa.gov/oar/primer/>.

## **Greenspace Program**

### ***Summary***

The Georgia Greenspace program encourages urban and rapidly growing counties to identify 20 percent of land within their county as Greenspace. The Georgia Greenspace program was created in 2000, and was designed with a specific purpose. The program's purpose is to provide county and city governments with the resources to purchase properties critical for the permanent protection of Greenspace. This land is used by local planners to incorporate Greenspace areas in communities to provide areas of very little or no development. In Middle Georgia, the Greenspace program gives eligible communities the opportunity to develop a program to meet local conditions while providing eligible communities with the resources necessary to develop Greenspace Programs in their communities. The land selected depends upon a county's priorities for

preserving designated Greenspace areas and vary from county to county depending on priorities.

Greenspace is defined as land and water permanently protected and whose development rights have been separated from the property. It also includes land or water that is in its undeveloped, natural state and is consistent with, or is restored to be consistent with, one or more of the following goals:

- ? water quality protection for rivers, streams, and lakes;
- ? flood protection;
- ? wetlands protection;
- ? reduction of erosion through protection of steep slopes, areas with erodible soils, and stream banks;
- ? protection of riparian buffers and other areas such as marsh hammocks that serve as natural habitats and corridors for native plant and animal species;
- ? scenic protection
- ? protection of archaeological and historic resources;
- ? provision of recreation in the form of boating, hiking, camping, fishing, hunting, running, jogging, biking, walking, skating, birding, riding horses, observing or photographing nature, picnicking, playing non-organized sports, or engaging in free play; and
- ? connection of existing or planned areas contributing to the goals set out in this paragraph.

### ***Program Eligibility***

To be an eligible community for Greenspace funds in Georgia, a county must meet the statutes defining the Greenspace program. The statute defines community as a county which has attained a population of 60,000 people as of the 1990 or any more recent decennial census, or which has grown by 800 people a year, on average, between the 1990 or any more recent decennial census and the most recent U.S. Bureau of the Census estimate of population. A county that attains a population of 60,000 in the 2000 or any later decennial census or which grows by more than 800 people a year will become eligible for the program. The Georgia DNR determines eligibility annually based on the 2000 census and the most recent annual estimate of population, which is prepared by the U.S. Bureau of the Census and released each spring. The Department notifies counties of their eligibility during July of each year.

Program participation for eligible counties is, not a requirement. Each eligible county that elects to prepare a grant application, receives approval for Greenspace programs, and establishes a Community Greenspace Trust Fund, will receive a state grant that is proportional to its levy of ad valorem tax on residential property. Currently, all eligible counties in the Macon MSA participate in the Greenspace program. The program encourages local governments to envision how they want their jurisdictions to look 30 years from now. Furthermore, a county will not lose funding if it fails to achieve 20 percent Greenspace and is making a good-faith effort to achieve the goal.

### ***County-By-County Greenspace Description***

Counties within the new Macon Metropolitan Statistical Area (MSA) that qualify for Greenspace funds include Monroe, Bibb, and Crawford Counties. The Warner Robins MSA is also an eligible community. Twiggs County did not meet the population qualifications for financial assistance for Greenspace and currently has no Greenspace program. Information in the table “Middle Georgia Greenspace Award Levels (2002)” is a summary of funds allocated to Middle Georgia communities through the Greenspace program. These figures indicate that of the three Middle Georgia counties within the Macon MSA and the Warner Robins MSA that qualified for Greenspace assistance, \$900,313 were allocated to these counties. The following discussion will give a brief summary of actions taken by each county and what funds were spent.

**Middle Georgia Greenspace Award Levels (2002)**

<b>Jurisdiction</b>	<b>County Eligibility</b>	<b>Programmed Share</b>	<b>Year-end Grant Award</b>	<b>Grand Total by Grantee</b>
<b>Bibb</b>	<b>\$390,336</b>	\$105,391	\$6,944	<b>\$112,335</b>
<b>Crawford</b>	<b>\$32,323</b>	\$32,323	\$2,130	<b>\$34,453</b>
<b>Houston</b>	<b>\$345,445</b>	\$345,445	\$22,759	<b>\$368,204</b>
<b>Monroe</b>	<b>\$76,559</b>	\$76,559	\$5,044	<b>\$81,603</b>
<b>Totals</b>	<b>\$844,663</b>	\$844,663	\$55,650	<b>\$900,313</b>

*Source: Georgia Department of Natural Resources*

### ***Bibb County***

The Bibb County Greenspace Program has centered on the purchase and revitalization of Fort Hawkins, a county landmark. Fort Hawkins was built in 1806 by the United States government under the administration of President Thomas Jefferson. It overlooked the ancient Indian mounds of the Ocmulgee Old Fields, as well as the future site of Macon across the river.

In 1938, through the efforts of the Nathaniel Macon Chapter of the Daughters of the American Revolution and with the Works Progress Administration, a replica of Fort Hawkins' southeastern blockhouse was reconstructed on the exact location of the original, using some of the original stones in the basement section. The upper floors are made of concrete formed to simulate the original wood timbers.

During reconstruction, archaeology conducted at the site revealed the location and extent of the stockade walls and corner blockhouses. These excavations uncovered many everyday items used by the fort's inhabitants. The City of Macon acquired the historic site in 2002. The replicated southeast blockhouse, which is occasionally opened to the public, is a Macon icon.

Bibb County spent \$128,820 in FY 2001 and has a remaining FY 2001 balance of \$81,361. In FY 2002, Bibb County had a Greenspace Program budget of \$112,335 and

to date, Bibb County has not expended any of these funds from the FY 2002 budget period.

### ***Crawford County***

The Crawford County Greenspace Program has identified a specific piece of land running along Highway 128. This piece of land includes the gravesite of Revolutionary War hero Colonel Benjamin Hawkins, who served as the Creek Indian Nation Indian Agent for General George Washington. It is the intention of Crawford County to purchase this land and create a walking trail that extends along the Flint River with the trail beginning at Highway 128 and running to the gravesite. However, Crawford County has yet to purchase any land with Greenspace funds.

### ***Houston County***

The Greenspace Program of Houston County is a network of programs comprised of municipalities within Houston County. The cities of Centerville, Perry and Warner Robins all have active Greenspace programs.

In 2003, the Centerville Greenspace program appraised and purchased 6.4 acres from George Bertram in order to create a walking trail around the “Bay Gall Creek” area of Centerville and Warner Robins.

The City of Warner Robins purchased land along with Houston County to develop a series of walking trails along the “Bay Gall” area as well as the Wellstone Trail, which is part of the “Bay Gall Creek” area of Warner Robins. Furthermore, property was purchased in 2003 to create a buffer zone between some military housing units and some additional land used for recreation purposes.

The total expenditures for the Houston County Greenspace program have exceeded \$263,240 in FY 2003.

### ***Monroe County***

The Monroe County Greenspace program has worked to secure property along the Ocmulgee River. This property creates additional Greenspace and will eventually allow for the development of a walking trail along the Ocmulgee River and a park with boat ramp access. The program had a budget of \$81,603 beginning in FY 2002 of which \$60,000 went to purchase property to enhance the goal of the program. The Greenspace program is currently developing a plan to buy additional land in the county with the balance of approximately \$20,000.

## **Undeveloped Land and Natural Resources**

The following information is reference material describing land area uses on maps provided in this Environmental Review. Each county in the Macon MSA prior to June 30, 2003 is provided. Special attention should be given to the amount of areas identified as pasture, forested wetland, coniferous forest, mixed and hardwood forest areas in

relation to low and high density urban areas in each county. Changes to these categories, either from the past or in the future, can indicate urban sprawl and/or inconsistencies in growth in areas where the local governments have not targeted their efforts for quality growth. Proper attention given to geographic components can alleviate these issues. Maps for each county are attached to this Environmental Review.

### ***Open Water***

Lakes, reservoirs, coastal waters, ponds and wide stream channels with little or no emergent vegetation are included in this class. For the purposes of this environmental review, open water areas are indicated with the color white.

### ***Clearcut/Young Pine***

Clearcuts are often small in areas and regularly shaped with the typical clearcut/young pine having widely-spaced woody vegetation with a ground cover of herbs and grasses. For the purposes of this Environmental Review, clearcut/young pine areas are indicated with the color red.

### ***Pasture***

Pasture land is distinguished from other agricultural land by the presence of low-growing herbaceous vegetative cover year-round. This class includes actual pastures, lawns, fields, and other open areas within urban areas. Pasture can be similar to cultivated fields that have vegetative cover during the winter. For the purposes of this Environmental Review, pasture areas are indicated with the color green.

### ***Cultivated/Exposed Earth***

Agricultural fields with no winter vegetation, and any other areas where vegetation has recently been removed, exposing soil or rock, are represented by this class. Exposed banks around reservoirs with low water levels often are included in this class. This class may be found within urban areas and in conjunction with the pasture and clearcut/young pine classes in other areas. For the purposes of this Environmental Review, cultivated/exposed earth areas are indicated by a dark blue color in the map index.

### ***Low Density Urban***

Low density urban class represents urban areas with moderate vegetative cover. However, any area with high reflectivity, such as isolated industrial sites, may fall into this or the high density urban class. It is typical for residential areas to be shown as a matrix of this class and forest class pixels. Low density urban may be interspersed with high density urban. For the purposes of this Environmental Review, low density urban areas are indicated by a light blue color in the map index.

### ***High Density Urban***

High Density Urban areas contain paved areas with buildings and little vegetation. Roads are often shown as linear features composed of high and low-density urban pixels. High-density urban pixels found outside of urban areas are indicative of any type of highly reflective structure feature such as power substations, grain storage buildings. High-density urban areas are indicated by a pink color in the map index.

### ***Emergent Wetland***

Emergent wetlands are spectrally and ecologically transitional between open water and scrub/shrub wetlands. Freshwater marsh vegetation with few woody plants interspersed is typical of the cover type. Where clusters of emergent wetland pixels are found, other wetland types and open water are often in proximity. This class may show up in some non-wetland areas with low-reflectivity cover. Emergent wetland areas are indicated in the mapped areas by a yellow color.

### ***Scrub/Shrub Wetland***

Intended for wetland vegetation dominated by woody plants less than 20 feet in height, this class contains areas in transition between emergent and forested wetlands. This class is usually found in conjunction with other wetland classes. When found singly within a matrix of low urban density and forest pixels, it is more likely that cover spectrally similar to but not actually scrub/shrub wetland is being shown. This area is indicated on land use maps in this review by an orange color.

### ***Forested Wetland***

Areas of swamp are often shown as mixtures of forested wetland and hardwood forest pixels. Classification of forested wetlands dominated by deciduous trees is probably more accurate than that in areas with evergreen, closed canopies. Low reflectivity of the wet areas underneath a canopy can be hard to identify, making them difficult to distinguish from upland evergreen forest canopies. This area is identified on land use maps in this review by a light green color.

### ***Coniferous Forest***

The uniformity of large tracts of planted pines provides for accurate classification of this landcover type in upland areas. These stands may be fringed or bisected by the other forest types. Where pine canopies are dense, as is often the case, it may be difficult to determine whether the sites are upland or wetland. For the purposes of this Environmental Review, coniferous forest areas are indicated by a dark green color.

### ***Mixed Forest***

Typically, this class represents mixed stands of hardwood and coniferous trees, neither type exceeding 60-70 percent of the stand. Pine plantations in transition from early stages to forest may be shown in this class, although few if any hardwood trees may be present. Edges of coniferous stands and areas of transition between coniferous and hardwood forest are often shown with this class. This area type is identified by a dark purple color in the land use maps provided for this review.

### ***Hardwood Forest***

Stands of deciduous hardwoods are generally distinguished from forested wetlands and other forest classes accurately. Evergreen hardwood forests may be spectrally similar to mixed and coniferous classes and, due to a closed canopy, may be difficult to distinguish from evergreen forested wetlands. River floodplains are often depicted as a mixture of forested wetland and hardwood forest pixels with drier areas shown as hardwood forest.

Hardwood forest areas are indicated on the land use maps provided by a light purple color.

Information Source: <http://csat.gatech.edu/statewide/metadata/landcov.txt>

### **Endangered Species**

The Georgia Department of Natural Resources maintains a three-tiered system of threatened species according to the DNR website; this page can be accessed through the Georgia Wildlife section of the DNR website. An endangered species is one which faces extinction in the near future without any outside protection, while a threatened species is one which faces endangerment in the near future. The abbreviation ‘US’ indicates federally-protected status, ‘GA’ indicates state-protected status, and ‘DNR’ indicates GADNR has listed this as a rare species. GADNR recognizes the *DNR* status when it determines species are threatened but not protected by state or federal statute.

Within the area covered by this report, several species categorized as federally or state protected exist. However, as measures have been taken to ensure that these species are sustained within their natural habitats, the impact of their presence within the area is minimized. Additionally, the presence of Robins Air Force Base does not pose a significant threat to any of these species. The chart below shows the total number of species within each tier in the MSA counties of Middle Georgia.

**Protected Species within Middle Georgia**

<b>Category</b>	<b>Houston</b>	<b>Bibb</b>	<b>Crawford</b>	<b>Jones</b>	<b>Monroe</b>	<b>Peach</b>	<b>Twiggs</b>
<b>Number of US Protected Species</b>	1	3	3	2	1	1	2
<b>Number of GA Protected Species</b>	2	0	4	2	1	2	1
<b>Number of DNR Threatened Species</b>	8	2	8	3	3	2	1
<b>Total Per County</b>	11	5	15	7	5	5	4

See the following charts for a complete list of plant and animal species by county:

### Endangered Plants Within Middle Georgia Region

County	US	GA	DNR
<b>Houston</b>	· <i>Trillium reliquum</i> Relict Trillium	· <i>Hexastylis shuttleworthii</i> var. <i>harperi</i> Harper Heartleaf	· <i>Lobelia boykinii</i> Boykin Lobelia
		· <i>Scutellaria ocmulgee</i> Ocmulgee Skullcap	· <i>Rhexia aristosa</i> Awned Meadowbeauty
			· <i>Teloschistes exilis</i> Orange Foliose Bark Lichen
			· <i>Tragia cordata</i> Heartleaf Nettle Vine
			· <i>Trillium lancifolium</i> Lanceleaf Trillium
<b>Bibb</b>	· <i>Silene polypetala</i> Fringed Campion		
	· <i>Trillium reliquum</i> Relict Trillium		
	· <i>Sarracenia rubra</i> Sweet Pitcherplant		
<b>Crawford</b>	· <i>Sarracenia rubra</i> Sweet Pitcherplant	· <i>Chamaecyparis thyoides</i> Atlantic White-cedar	· <i>Scirpus etuberculatus</i> Canby's Club-rush
	· <i>Silene polypetala</i> Fringed Campion		
<b>Jones</b>	· <i>Trillium reliquum</i> Relict Trillium		· <i>Lindera subcoriacea</i> Bog Spicebush
<b>Monroe</b>			· <i>Quercus prinoides</i> Dwarf Chinkapin Oak
<b>Peach</b>	· <i>Sarracenia rubra</i> Sweet Pitcherplant	· <i>Chamaecyparis thyoides</i> Atlantic White-cedar	· <i>Chamaecrista deeringiana</i> Florida Senna
		· <i>Nestronia umbellula</i> Indian Olive	
<b>Twiggs</b>	· <i>Trillium reliquum</i> Relict Trillium		

Source: Georgia Department of Natural Resources

### Endangered Animals Within Middle Georgia

County	US	GA	DNR
<b>Houston</b>			· <i>Cyprinella callisema</i> Ocmulgee Shiner
			· <i>Heterodon simus</i> Southern Hognose Snake
			· <i>Hybognathus regius</i> Eastern Silvery Minnow
<b>Bibb</b>			· <i>Hybognathus regius</i> Eastern Silvery Minnow
			· <i>Necturus punctatus</i> Dwarf Waterdog
<b>Crawford</b>	· <i>Elliptoideus sloatianus</i> Purple Bankclimber	· <i>Cyprinella xaenura</i> Altamaha Shiner	· <i>Etheostoma edwini</i> Brown Darter
		· <i>Graptemys barbouri</i> Barbour's Map Turtle	· <i>Etheostoma swaini</i> Gulf Darter
		· <i>Notropis hypsilepis</i> Highscale Shiner	· <i>Ichthyomyzon gagei</i> Southern Brook Lamprey
			· <i>Lampsilis binominata</i> Lined Pocketbook
			· <i>Necturus punctatus</i> Dwarf Waterdog
			· <i>Pteronotropis hypselopterus</i> Sailfin Shiner
			· <i>Quincuncina infucata</i> Sculptured Pigtoe
<b>Jones</b>	· <i>Picoides borealis</i> Red-cockaded Woodpecker	· <i>Cyprinella xaenura</i> Altamaha Shiner	· <i>Cyprinella callisema</i> Ocmulgee Shiner
		· <i>Etheostoma parvipinne</i> Goldstripe Darter	· <i>Hemidactylum scutatum</i> Four-toed Salamander
<b>Monroe</b>	· <i>Haliaeetus leucocephalus</i> Bald Eagle	· <i>Cyprinella xaenura</i> Altamaha Shiner	· <i>Cyprinella callisema</i> Ocmulgee Shiner
			· <i>Hybognathus regius</i> Eastern Silvery Minnow
<b>Peach</b>			· <i>Pteronotropis hypselopterus</i> Sailfin Shiner
<b>Twiggs</b>	· <i>Haliaeetus leucocephalus</i> Bald Eagle	· <i>Clemmys guttata</i> Spotted Turtle	· <i>Cyprinella callisema</i> Ocmulgee Shiner

Source: Georgia Department of Natural Resources

## **Brownfield Sites**

There are 32 sites in the study area which are listed on the United States Environmental Protection Agency (EPA) Comprehensive Environmental Response, Compensation, and Liability Information System (CERCLIS) database. The CERCLIS database contains information on hazardous waste sites, potential hazardous waste sites, and remedial activities, including sites on the National Priorities List (NPL) or under consideration for the NPL. NPL sites are those listed by the EPA as environmental hazards which necessitate remediation before any other occupation of that site can occur and delisting of the site can take place. The sites within the study area on the NPL are as listed below:

### **NPL Sites within Middle Georgia Area**

<b>EPA ID</b>	<b>Site Name</b>	<b>City</b>	<b>County</b>	<b>NPL Status</b>
GAD003302676	Allied Industrial Park	Macon	Bibb	N
GASFN0406912	Arbor Estates Mobile Home Park Area	Macon	Bibb	N
GAD981234206	Archer Daniels Midland Adm. Inc.	Macon	Bibb	N
GA0001404409	Ash & Broadway	Macon	Bibb	N
GA0000102178	Former Macon Naval Ordinance Landfill	Macon	Bibb	S
GAD067589168	Georgia Steel, Inc.	Macon	Bibb	N
GAD984306076	Macon Gas Light and Water Company	Macon	Bibb	N
GAD980709257	Safety-Kleen Corp 3-106-21	Macon	Bibb	N
GAD003264074	Southern Wood Piedmont Co.	Macon	Bibb	N
GASFN0407019	Walker Lakes Dump Site	Macon	Bibb	N
GAN000407525	Carpenter Construction Company	Warner Robins	Houston	N
GAN000407527	Fabra-Care Cleaners	Perry	Houston	N
GA1570024330	Robins Air Force Base (Landfill #4 – Sludge Lagoon)	Houston County	Houston	F
GAN000407629	Sheets Communications Property	Warner Robins	Houston	N
GAD033823386	Tolleson Lumber Company	Perry	Houston	N
GASFN0407009	John Weiters Farm	Round Oak	Jones	N
GASFN0407031	Buddy Phillips Salvage Yard	High Shoals	Monroe	N
GA0001020874	Anthoine Machine Works	Fort Valley	Peach	N
GA0001974989	Fabra-Care Cleaners	Fort Valley	Peach	N
GA0001974898	Former Anderson Street Dry Cleaner	Fort Valley	Peach	N
GA0001974880	Former Cotton Seed Oil Mill (Vacant Lot)	Fort Valley	Peach	N
GA0001974948	Former Main Street Dry Cleaners	Fort Valley	Peach	N
GASFN0406882	Former Print Shop	Fort Valley	Peach	N
GA0001974906	Former West Church Street Dry Cleaner	Fort Valley	Peach	N
GAN000407524	Kirkland Property Landfill	Byron	Peach	N
GAR000022095	Middle Georgia Quality Cleaning Company	Fort Valley	Peach	N
GASFN0406880	Norfolk Southern Railroad Depot	Fort Valley	Peach	N
GAD984319012	Peach Maximum Auto Care (Peach Mac)	Fort Valley	Peach	N
GAD984287193	Peach Metals	Byron	Peach	N
GAD980496954	Powersville Site	Fort Valley	Peach	F
GA0000048934	Vienna Street Dump Site	Fort Valley	Peach	N
GAD003269578	Woolfolk Chemical Works	Fort Valley	Peach	F

The three sites on the Final NPL list are Robins Air Force Base in Houston County, the Powersville Site in Peach County, and the Woolfolk Chemical Works Site in Peach County. According to the EPA, remediation actions for these three sites have either been completed or are ongoing.<sup>1</sup> Sites listed on the Final NPL list are specifically investigated by the EPA for environmental hazards.

The Robins Air Force Base Site NPL listing includes a 45-acre landfill and a 1.5-acre sludge lagoon. These sites were placed on the National Priorities List in 1987 due to the previous disposal of phenols, oils, heavy metals, cyanide, solvents, cleaner, paint removers, hydraulic fluids, and oils. This site currently sits atop an aquifer which supplies water for the City of Warner Robins, with over 10,000 people potentially affected. Remediation actions included construction of run-off controls, a landfill cap, vapor extraction, solidification of the sludge lagoon, and a leachate collection system. Monitoring is currently taking place.<sup>2</sup>

The Woolfolk Chemical Works Site NPL listing includes 31 acres. This site was placed on the NPL list in 1990, after several years of monitoring by the Georgia Environmental Protection Division. The Woolfolk Company manufactured pesticides in liquid, dust, and granular forms which resulted in detected metals and pesticides, including lead, arsenic, chlordane, DDT, lindane, and toxaphene. These effluents would flow from an open ditch at the site into Big Indian Creek. Remedial actions have included removal of contamination from 26 residential properties in Fort Valley, including 48,900 tons of contaminated soil and debris. Currently the Woolfolk site is still undergoing remediation activities due to the findings of additional contamination surrounding the site.<sup>3</sup>

The Powersville Landfill Site NPL listing includes 15 acres. This site was placed on the NPL list in 1984. The Powersville Landfill Site accepted debris and waste from the above Woolfolk Chemical Works, with a remedial investigation indicating the presence of benzene hexachloride, vinyl chloride, lead, chromium, dieldrin, chlordane, and toxaphene. Samples of these contaminants were found in local wells. Remediation included surface cover systems of the landfill areas, installation of additional groundwater monitoring wells, provision of alternative water supplies for nearby residents, and deed restrictions. The five-year remediation review of this site was completed in 1998, which stated that the remediation was complete. However, monitoring will continue on the site.<sup>4</sup>

## **Landfills**

In their annual *Solid Waste Management Annual Report*, the Georgia Department of Community Affairs (DCA) provides the information below regarding landfill capacity in

---

<sup>1</sup> <http://cfpub.epa.gov/supercpad/cursites/srchsites.cfm>

<sup>2</sup> [www.epa.gov/region4/waste/npl/nplga/robinsga.htm](http://www.epa.gov/region4/waste/npl/nplga/robinsga.htm)

<sup>3</sup> [www.epa.gov/region4/waste/npl/nplga/wolfokga.htm](http://www.epa.gov/region4/waste/npl/nplga/wolfokga.htm)

<sup>4</sup> [www.epa.gov/region4/waste/npl/nplga/powrvlga.htm](http://www.epa.gov/region4/waste/npl/nplga/powrvlga.htm)

the Middle Georgia MSA regions.<sup>5</sup> Until recently, both construction and demolition waste (C&D) and Municipal Solid Waste (MSW) were combined in landfills. Following the impact of environmental regulations, landfills are now separated into C&D facilities and MSWL facilities, which are MSW facilities with a liner to help keep the environment clean.

### Middle Georgia Landfill Capacities and Fill Rates

	<b>Total Tons Disposed FY 02</b>	<b>Domain</b>	<b>Facility Type</b>	<b>Remaining Capacity (CY)</b>	<b>Average Daily Tons</b>	<b>Rate of Fill (CYD)</b>	<b>Estimated Fill Date</b>	<b>Remaining Permitted Capacity (Years)</b>
<b>Swift Creek Landfill</b>	76,469	Private	C&D	419,939	204	355	7/5/2006	3.5
<b>Central State Hospital - Freeman Building</b>	269	Public	C&D	7,449	1	1	6/21/2024	21.5
<b>Houston Co. -- S.R. 247 Klondike</b>	52,247	Public	C&D	3,762,193	184	368	1/1/2035	33.0
<b>Macon - Walker Rd.</b>	87,457	Public	Unlined MSW	2,827,209	430	860	3/27/2013	10.3
<b>Swift Creek MSW Landfill</b>	247,701	Private	MSWL	2,892,991	882	1,217	9/5/2010	7.5
<b>Baldwin Co. - Union Hill Church Rd.</b>	33,897	Public	MSWL	2,708,450	100	200	9/19/2045	42.5
<b>Houston Co. - S.R. 247 Klondike</b>	124,226	Public	MSWL	5,332,182	313	522	12/28/2034	32.0
<b>Monroe Co. - Strickland Loop Rd.</b>	11,943	Public	MSWL	2,339,494	33	67	11/1/2114	111.8
<b>Twiggs Co. - U.S. 80</b>	11,836	Public	MSWL	4,538,869	36	75	7/16/2202	199.5

<sup>5</sup>[http://www.dca.state.ga.us/environmental/SWAR\\_2002\\_update\\_for\\_web/SWAR2002Capacity\\_Disposal.pdf](http://www.dca.state.ga.us/environmental/SWAR_2002_update_for_web/SWAR2002Capacity_Disposal.pdf)

Although this list is currently inclusive of all operating landfills in the area, it does not represent any future landfills or solid waste disposal facilities which are currently in the planning phase. As noted above, there are only two landfills in the Macon MSA which are scheduled to be filled within the next ten years. The Middle Georgia Region has ample landfill space for future business, industry, and expansion, with some landfills such as that in Twiggs County, having a future expected life of nearly 200 years.

### **Historic Places**

The Middle Georgia Regions has over 40 different sites listed on the United States National Register of Historic Places. Please see the following chart for a listing of these sites. In order to be listed on the National Register, a site must meet the criteria set forth by Georgia's office of Historic Preservation. These criteria revolve around the perceived historical value of a site, or of past residents of a particular site. Examination of these historical structures reveal that many of the properties are located in small towns or unincorporated portions of the study area, with the exception of downtown Macon. There are no historic properties in close proximity to Robins Air Force Base. The table on the attached page shows each historic structure and its location by city.

### National Register of Historic Places for Study Area

<b>County</b>	<b>Historic Facility</b>	<b>City</b>
Bibb	Anderson, Capt. R. J., House	Macon
Bibb	Anderson, Judge Clifford, House	Macon
Bibb	Baber, Ambrose, House	Macon
Bibb	Burke, Thomas C., House	Macon
Bibb	Cannonball House	Macon
Bibb	Central City Park Bandstand	Macon
Bibb	Cherokee Brick and Tile Company	Macon
Bibb	Cherokee Heights District	Macon
Bibb	Christ Episcopal Church	Macon
Bibb	Collins--Odom--Strickland House	Macon
Crawford	Crawford County Courthouse	Knoxville
Crawford	Crawford County Jail	Knoxville
Crawford	Roberta Historic District	Roberta
Crawford	Williams --Moore--Hillsman House	Roberta
Houston	Davis -Felton Plantation	Henderson
Houston	Log Dogtrot House	Kathleen
Jones	Cabaniss-Hanberry House	Bradley
Jones	Cabiness-Hunt House	Round Oak
Jones	Jarrell Plantation	East Juliette
Jones	Jones County Courthouse	Gray
Jones	Jones County High School	Gray
Jones	Old Clinton Historic District	Clinton
Monroe	Culloden Historic District	Culloden
Monroe	Forsyth Commercial Historic District	Forsyth
Monroe	Front Circle, Tift College	Forsyth
Monroe	Great Hill Place	Bolingbroke
Monroe	Hil'ardin/Sharp-Hardin-Wright House	Forsyth
Monroe	Monroe County Courthouse	Forsyth
Monroe	Montpelier Female Institute	Macon
Monroe	State Teachers and Agricultural College for Negroes Women's Dormitory and Teachers' Cottage	Forsyth
Peach	Byron Historic District	Byron
Peach	Everett Square Historic District	Fort Valley
Peach	Everett, James A., House	Fort Valley
Peach	Fort Valley State College Historic District	Fort Valley
Peach	Peach County Courthouse	Fort Valley
Peach	Strother's Farm	Fort Valley
Twiggs	Bullard--Everett Farm Historic District	Jeffersonville
Twiggs	Chapman, John, Plantation	Jeffersonville
Twiggs	Myrick's Mill	Fitzpatrick
Twiggs	Richland Baptist Church	Jeffersonville
Twiggs	Twiggs County Courthouse	Jeffersonville
Twiggs	Wimberly Plantation	Jeffersonville

## **Conclusion**

Through examination of environmental conditions and concerns and the impact of each on the Middle Georgia ecosystem, it can be determined that Middle Georgia can support the existing uses of its environment. The abundance of water, undeveloped land, and landfills within the seven-county area presents a tremendous benefit to the area. Further, efforts being undertaken by local governments to implement Greenspace goals and programs, measures taken to improve water quality, and the cleanup of brownfield sites provide positive benefit to the collective Middle Georgia community. A commitment to improving the quality of life in Middle Georgia has been demonstrated through these environmental actions.

Pending actions by EPA and EPD regarding air quality in Middle Georgia could have a negative impact on the community. However, the pro-active approach begun by the community in 1999, almost five years prior to a declaration of a non-attainment area, indicates that Middle Georgia has committed to take actions to improve the quality of air that its residents breathe. Forward thinking by leaders within Middle Georgia have resulted in the community acting in an environmentally friendly manner.