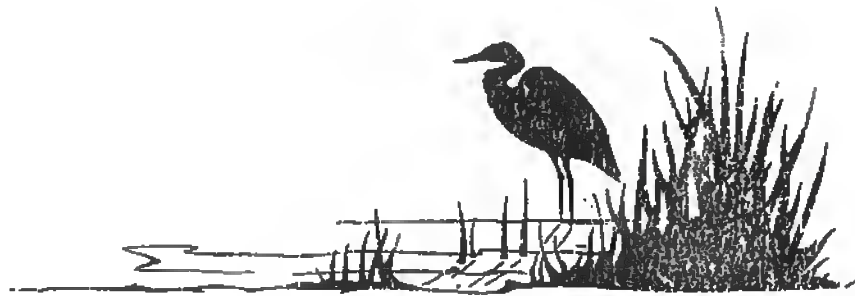


# The 208 Water Quality Management Plan for the Central Midlands Region

*Fairfield  
Newberry  
Lexington  
&  
Richland  
Counties*



*Adopted:  
February 27, 1997*

---

**Prepared by the Central Midlands  
Council of Governments**

## **Acknowledgements**

### **Environmental Planning Advisory Committee**

|                         |  |
|-------------------------|--|
| John Carrigg, Chairman  | Lexington County                                     |
| Betty Baird             | Lexington County Clemson Extension Service           |
| Chip Berry              | SC Department of Natural Resources                   |
| Art Brooks              | Lexington County                                     |
| William Bull            | Lexington County Joint Municipal Water & Sewer Comm. |
| Nell Cannon             | Town of Chapin                                       |
| Gene Edwards            | East Richland Public Service District                |
| Doug Fabel              | SC Department of Health & Environmental Control      |
| W. Avery Frick          | Fairfield County                                     |
| Vacant                  | Town of Winnsboro                                    |
| Gwen Geidel             | University of South Carolina                         |
| L.C. Greene             | Town of Lexington                                    |
| Charles Guerry          | City of Newberry                                     |
| Miles Hadley            | City of Columbia                                     |
| Dr. Mary Kelly          | League of Women Voters                               |
| Arnold Lingle           | Newberry County Water & Sewer Authority              |
| Andy Metts              | Richland County                                      |
| George Mick, Vice Chair | Richland County                                      |
| Keith Murphy            | Carolina Water Service                               |
| Robert Penick           | Town of Batesburg-Leesville                          |
| David Rhoten            | Citizen - Environmental Interests                    |
| Frank Robinson          | City of Cayce  |
| W. E. Sellars           | C. W. Haynes & Co., Inc.                             |
| D. J. Shull             | Lexington County Farm Bureau                         |
| William Unthank         | City of West Columbia                                |

### **Special Appreciation:**

South Carolina Department of Health & Environmental Control  
South Carolina Department of Natural Resources

The 208 Water Quality Management Plan  
for the  
Central Midlands Region

*Fairfield  
Newberry  
Lexington  
&  
Richland  
Counties*

February 1997

Prepared By:  
Central Midlands Council of Governments

Phone: 803/376-5390  
Fax: 803/376-5394



## Table of Contents

|   | Page |
|---|------|
| <b>Introduction</b>                                     | 01   |
| Purpose And Need  | 01   |
| Reason For Updating The Plan                            | 02   |
| Background  | 02   |
| Authority And Jurisdiction                              | 09   |
| Current Issues  | 09   |
| Planning Framework                                      | 10   |
| <b>Regional Framework</b>                               | 13   |
| General Description Of The Region                       | 13   |
| Water Resources: Opportunities And Constraints          | 20   |
| Public Water Systems                                    | 20   |
| Water Quality Assessment & Segment Classification       | 25   |
| Environmental Issues                                    | 29   |
| Development Trends                                      | 30   |
| Demographics  | 30   |
| Institutional Designations & Responsibilities           | 32   |
| <b>Administrative Procedures</b>                        | 36   |
| Public Participation                                    | 36   |
| Plan Amendments   | 36   |
| Comprehensive Plan Revisions & Annual Updates           | 40   |
| Conformance Reviews                                     | 40   |
| <b>Regional Policies</b>                                | 43   |
| Biosolids & Septage Collection And Disposal             | 43   |
| Elimination of Discharges & Consolidation of Facilities | 44   |
| Location, Sizing, Staging And Level Of Treatment        | 44   |
| Population Forecasts                                    | 46   |
| Septic Tank And Other Individual Disposal Systems       | 47   |
| Stormwater Management                                   | 47   |
| Nonpoint Source Pollution                               | 49   |
| TMDL Allocation   | 50   |
| Water Reuse   | 51   |
| Water Supply  | 51   |
| Wetlands  | 54   |
| Management Agencies                                     | 55   |

|   |     |
|---|-----|
| <b>River Basin Assessment and Management Strategy</b> | 59  |
| Broad River River Basin                               | 62  |
| Existing Basin Inventory                              | 62  |
| Projected Growth                                      | 67  |
| Water Quality Issues and Standards                    | 69  |
| Management and Policy Issues                          | 70  |
| Long Range Basin Planning                             | 73  |
| Catawba-Santee River Basin                            | 76  |
| Existing Basin Inventory                              | 76  |
| Projected Growth                                      | 80  |
| Water Quality Issues and Standards                    | 83  |
| Management and Policy Issues                          | 91  |
| Long Range Basin Planning                             | 93  |
| Saluda-Edisto River Basin                             | 95  |
| Existing Basin Inventory                              | 95  |
| Projected Growth                                      | 110 |
| Water Quality Issues and Standards                    | 115 |
| Management and Policy Issues                          | 115 |
| Long Range Basin Planning                             | 141 |
| <b>Plan Implementation</b>                            | 146 |
| Facilities Management                                 | 146 |
| Non-Point Source Pollution Management                 | 147 |
| Financing Options                                     | 150 |
| <b>References</b>                                     | 153 |
| <b>Appendix</b>                                       | 156 |
| <b>Glossary</b>                                       | 159 |

## **List of Tables**

|   | <b>Page</b> |
|---|-------------|
| 1. Central Midlands Planning Area Land Use/Land Cover           | 16          |
| 2. State-owned Lands In Central Midlands Regional Planning Area | 16          |
| 3. Drainage Basins And Watersheds                               | 18          |
| 4. Freshwater Classifications                                   | 26          |
| 5. Riverine Summary Data  | 27          |
| 6. Use And Classification                                       | 29          |
| 7. Population Trends By County, 1980 - 2010                     | 31          |
| 8. New Construction By County, 1992 - 1995                      | 31          |
| 9. Stormwater Management Objectives                             | 49          |
| 10. Broad River - River Basin & Watersheds                      | 62          |
| 11. Population And Employment Projections                       | 68          |
| 12. Estimated Existing And Projected Flow                       | 69          |
| 13. Catawba-Santee - River Basin & Watersheds                   | 76          |
| 14. Discharges By County  | 78          |
| 15. Population And Employment Projections                       | 82          |
| 16. Estimated Existing And Projected Flow                       | 82          |
| 17. Saluda-Edisto - River Basin & Watersheds                    | 95          |
| 18. Discharges By County  | 100         |
| 19. Population And Employment Projections                       | 112         |
| 20. Estimated Existing And Projected Flow                       | 113         |

## List of Figures

|  | Page |
|--|------|
| 1. Statewide System Demand For Public Water                        | 21   |
| 2. Ground Water Contamination Sites in South Carolina, 1980 - 1994 | 54   |
| 3. Management Agency Areas - Richland & Lexington Counties         | 56   |
| 4. Management Agency Areas - Fairfield & Newberry Counties         | 57   |
| 5. Central Midlands Region - Watersheds                            | 61   |
| 6. Existing Land Use   | 157  |
| 7. Future Land Use   | 158  |



## I. INTRODUCTION

With the passage of the Federal Water Pollution Control Act of 1972, 33 U.S.C.A. §§ 1251-1387 (PL 92-500; as amended PL 95-217, 1977; PL 100-4, 1987), Congress initiated major steps toward insuring future generations of the highest level of water quality possible. The Clean Water Act identified a number of planning programs to be undertaken at various levels of government. To maximize the efficient use of resources, Section 208 of the Act established an areawide approach to mitigating water pollution. Section 208 provided criteria to design local plans within a regional context based upon a comprehensive and integrated approach to water pollution abatement, which helped to ensure that the goals of the Act were achieved within the framework of local needs and requirements. The State of South Carolina continues to use regional planning agencies throughout the State as a means of administering the Act.

### **Purpose and Need**

In South Carolina, the Department of Health and Environmental Control (DHEC) regulates activities affecting water quality and is responsible for establishing classifications and standards to protect beneficial uses of streams, lakes, and estuaries in the state. The planning process identifies actions to maintain water quality standards and addresses water quality issues associated with regional development. In the Central Midlands planning area of South Carolina, the water quality planning process under Section 208 of the Federal Clean Water Act is the responsibility of the Central Midlands Council of Governments (CMCOG) as the designated water quality planning agency. CMCOG maintains and periodically updates the Water Quality Management Plan (WQMP) as it strives toward preserving and enhancing state water quality standards and classifications for both surface and ground water.

The purpose of the 1996 WQMP is to revise the information -- the Central Midlands planning area (Fairfield, Lexington, Newberry and Richland Counties -- from the time of the last revision of the plan made in 1984, and to present current issues in water quality planning and policies to guide such planning.

More importantly, this document will serve as a tool for local decision makers when addressing land use and its influence on water quality. A holistic focus of water quality planning will prevent a piecemeal approach to decision making that leads to conflicts between development and conserving natural resources.

This 1996 Water Quality Management Plan supercedes all previous comprehensive plan revisions, annual plan updates and all past plan amendments.

## **Reason For Updating The Plan**

The comprehensive revision of the WQMP was done in 1984 with several annual updates prepared thereafter. Long held assumptions made ten years ago regarding growth and environmental impacts now require revisiting. Also, since the adoption of the 1984 Plan, numerous plan amendments have been adopted which have fundamentally altered the direction and scope of the 1984 Plan and the planning process. As part of this comprehensive revision, the Plan will address current issues and will link knowledge and ideas regarding the balance of water quality and land development. Clean water is essential for health, safety, and welfare of the public. Prospective businesses and industries wanting to locate in the Central Midlands planning area require public sewer and water. With proper planning and policies, suitable locations for economic development can be identified that will not conflict with society's values of clean water and a healthy environment.

## **Background**

During the 1960s and 1970s, local needs for water and wastewater plans merged with concerns in environmental protection. Historically, many local governments were faced with limited financial and technological means to foster growth and economic development while concurrently addressing its impacts to the environment. Nationally, water quality degradation prompted the federal government to act. It is from these two separate issues that a federal initiative established a process for watershed planning and grant-in-aid construction program to reduce water pollution nationwide.

## **Federal Water Pollution Control Act of 1972**

The Federal Water Pollution Control Act (FWPCA) of 1972 - commonly known as the "Clean Water Act" (CWA) - was enacted by the US Congress to establish national goals for restoring and maintaining the physical, chemical, and biological integrity of the nation's waters. Section 208 of the Act established an areawide approach to maintaining water quality. Section 208 also provided criteria to designing local plans within a regional context, based upon a comprehensive and integrated approach to minimize water pollution. These criteria will ensure that the goals of the Act are achieved based on local needs and requirements. One of the guiding principles behind Section 208 is the responsibility of the local government to perform analyses and determine solutions to local problems. The statute gives considerable discretion to the

local governments in the water quality standards to recommend to the State for adoption and how to achieve them. South Carolina has continued using this regional approach to water quality management planning.

Two primary goals were established by the FWPCA: 1) Eliminate the discharge of pollutants into navigable waters by 1985, and 2) attain water quality which provides for the protection and propagation of fish, shellfish, and wildlife, and provides for recreation in and on the water by July 1, 1983. Although these goals were largely achieved, changes in the federal law (1977 and 1987), altered the direction and approach to meeting these goals. In general, the States have greater discretion to achieve both federal and state water quality objectives, allowing each State its own method and structure to reach them. Before the FWPCA, the Central Midlands Region had undertaken several previous studies which formed the foundation of its first 208 Plan.

#### **Prior Local Efforts, 1968 - 1971**

##### **Federal Housing Administration Plans, 1968 - 1969**

Prior to the enactment of the CWA, the Central Midlands area had undertaken several utility planning efforts. The first effort began in 1968-69 as the Federal Housing Administration (FHA) assisted local governments in planning for future utility infrastructure as housing needs expanded. These plans only addressed the non-urbanized areas as FHA was only concerned with the undeveloped and rural portions of the counties. Four plans were produced to address the water and sewer needs for the region over the next twenty years:

- Comprehensive Water and Sewerage Plan - Richland County, 1968;
- Comprehensive Water and Sewerage Plan - Lexington County, 1968;
- A Comprehensive Water and Sewer Planning Study - Newberry County, 1969;
- A Comprehensive Water and Sewer Planning Study - Fairfield County, 1969.

In summary, these plans recommended the following:

1. In Richland County, the City of Columbia should be the primary wastewater provider and expand as needed over time to serve outlying areas with a move toward a combined countywide system. In the interim, Chapin, Irmo and Eastover were to operate oxidation ponds until consolidated with the Columbia system.

2. In Lexington County, only Batesburg, Leesville and Lexington had facilities in the non-urbanized portion and were to upgrade and expand. Irmo and Swansea were recommended to develop more sophisticated systems (other than oxidation ponds) and expand to serve adjacent areas.

3. In Newberry County, the City of Newberry was to serve surrounding development as was the Town of Whitmire. The remainder of the County was to be served by the newly established Newberry County Water & Sewer Authority (1963).

4. In Fairfield County, the Town of Ridgeway was to recondition its facilities and prepare to serve areas outside the Town's limits with other areas using independent systems as needed.

These plans made the counties eligible for FHA funding and raised questions regarding future wastewater and water infrastructure needs. Although because of funding and program requirements, the exclusion of the region's urbanized areas, Columbia, West Columbia, Cayce, Springdale and the municipalities of Newberry and Winnsboro left empty an opportunity to promote any integrated and global strategy for optimizing resources for growth and infrastructure needs.

#### Housing and Urban Development Plans, 1971

Recognizing the limitations offered in the FHA plans, the Central Midlands Council of Governments undertook a second effort to update and expand the study of utility infrastructure problems. Three documents were produced under this effort:

Water and Sewer Plan for the Winnsboro Area, 1971;  
Water and Sewer Plan for the Newberry Area, 1971;  
Water and Sewer Plan for the Greater Columbia Area, 1971.

In summary, the plans recommended:

1. The Town of Winnsboro was to serve the town itself and surrounding development;
2. The City of Newberry was to serve itself and surrounding development including the area southwest of the City and Silverstreet. A new treatment plant was recommended at Bush River and Rocky Branch Creek;
3. The City of Columbia become the designated service provider throughout Richland County, excluding the area served by the East Richland County Public

Service District (ERCPD). Lexington, West Columbia and Cayce each were to have their own service areas with additional recommendation that West Columbia contract for wastewater treatment with the City of Columbia. Lexington and Cayce were to have their own treatment capability.

## **Planning Under The Clean Water Act, 1976 - Present**

With the passage of the 1972 law, two programmatic issues arose: 1) completion of the planning requirements for grant-in-aid eligibility and 2) application of grant funding for construction of facilities. To receive funding for construction of new facilities, the region had to prepare a facilities plan that addressed the development of waste treatment plants, but at a minimum, how new facilities and their arrangement would improve the water quality standards in the area.

### **Columbia Metropolitan Sewerage Facilities Plan, 1976**

To accomplish the task, the Columbia Metropolitan Sewerage Facilities Plan, 1976 was crafted. This plan was completed in conformance with Section 201 of the new 1976 Act and sought to describe the arrangement of treatment plants, lines and related infrastructure to serve the metropolitan area for the twenty years. The plan examined alternative waste management techniques for the best practical waste treatment technology over the life of the systems. The plan was prepared with the assistance of citizens, professional staff and consultants. Although later expanded to fully cover all four counties (amended 1980), the study area only addressed the metropolitan or urbanized area and five other municipalities in Lexington, Newberry and Fairfield Counties.

The basic plan recommended the City of Columbia expand its treatment capacity from 20 to 45 MGD; ERPSD expand to 48 MGD; Cayce expand to 7.6 MGD; a new plant for the Cedar Creek area and an interim plant near Lake Murray called Lands End to be later closed with waste transferred to the City of Columbia. The other municipalities (Batesburg, Leesville, Winnsboro, Newberry, Prosperity and Swansea) were to serve areas immediately adjacent as growth required.



### The Columbia Metropolitan Areawide Water Quality Management Plan, 1978

While the "201 Facilities Plan" addressed the point source issues, the areawide plan was designed to focus on broad regional water quality matters such as non-point sources, management and implementation issues. Although as a matter of process, the areawide water quality management plan was to be prepared first, the 201 element or "facilities plan" was prepared in 1976 and was folded into the 208 element producing, a single, comprehensive water quality management approach for water pollution issues for the region.

Specifically, Section 208 of the 1972 Act addresses the need for continuing areawide water quality management planning by local and state governments to develop and carry out solutions to water pollution problems. Its initial approach was to designate areas that are either urban/industrial complexes, heavily populated, and/or environmentally sensitive. However, a federal court decision ordered that the new law applied to all land and waters in the nation.

The water quality management plan looks at the total environment contributing to the quality of both surface and ground water. Beyond point discharges treated in the 201 Plan are the broadly referred to non-point sources; that is diffuse sources of pollution such as stormwater runoff, sedimentation, septic tank seepage and poor agricultural/chemical practices.

### 1980 & 1982 Water Quality Management Plan Annual Updates

The principal recommendation outlined in 1980 update was to expand the planning boundaries to include all four counties in Central Midlands planning region as specified in planning council's state enabling legislation. The 1982 plan update outlined the status of outstanding sewer projects, addressed the issue of septic tank problems and prepared a separate document on administrative policies and procedures.

### The Columbia Metropolitan Sewer Facilities Plan 1983/84 Update ("Comprehensive Revision")

The 1983/84 plan was somewhat different from the previous 1976 and 1978 planning effort in two ways. First, it only focused on the metropolitan area instead of the complete four county plan area. At the time the majority of water quality issues did occur with the metropolitan area despite the need to resolve some long-standing issues in Newberry and Fairfield Counties. Another aspect to the planning effort was the

limited amount of planning funding available to undertake a comprehensive revision. This prompted a second major difference from the previous 70's effort. Since the 1976 201 Facilities Plan and 1978 208 Plan, a number of plan changes had occurred affecting facility design and regional management agency participation. Faced with limited funding and the impact of previous changes, CMRPC decided that this comprehensive revision was to be a combined plan; that is it mixed the 201 element with the 208 element. This approach was a positive step which remediated the limitations created from the first plan.

In many respects, the '83/84 Plan revision was a refinement of the 1976 and 1978 plans in that it directly assigned specific geographical areas or "management areas" to certain jurisdictions with responsibility to implement the plan. In general, the plan recommended:

1. Nine management areas which cover the urbanized portion of the metropolitan area.
2. Identified individual projects and their costs to be completed within set timeframes.
3. Established coordination mechanisms for plan implementation and steps for non-point source remediation efforts.

#### 1985 Water Quality Management Plan Annual Update

Following the adoption of 1983/1984 Comprehensive Revision, a 1985 annual update was prepared. It reported on the continuing planning efforts and reviewed the areawide plan by outlining the status of implementation steps taken by individual management agencies.

#### **Since The 1983/84 Comprehensive Revision**

Following the 208 Plan's adoption a number of changes occurred which altered the plan from its original blueprint to its current form. Of those changes, three developments have notably affected the provision of wastewater in the region and should be noted for their effects on the previous plan and any future plans.

## **Federal Perspective**

First were changes at the national level. During the mid-1980s, the federal government no longer provided funding for grant-in-aid construction but instead instructed each State to set up a revolving loan fund for local governments to use in the development of their infrastructure. With this action came a reduction in the level of construction efforts by many locals and a subsequent decline in federal priority for 208 planning. Several years later (1987), the federal government acted further to reduce its direct involvement by allowing each State to devise its own programmatic and planning approach for satisfying each state's own needs while fulfilling the overall provisions of the Clean Water Act. It is from this framework that the 1996 Water Quality Management Plan is prepared.

## **Key Plan Amendments**

A second fundamental change, but with a more local focus, was a 1986 plan amendment which designated Richland County as the management agency for the portion of the Wateree River Basin (Five, Twenty-five and Spears Creek Basins), where the plan had previously identified the City of Columbia as the provider. With the amendment was an action by Richland County selecting Wildewood Utilities as a franchise operator for providing service in this area. The net effect of this decision was that a private utility was to become a primary provider of sewer service for the northeast area of the County. Oversight regulation of Wildewood Utilities is performed by the SC Public Service Commission.

Lastly, the provision of service for the 12 & 14 Mile Creek Basin is expected to be fulfilled this year following a twenty year effort to develop a solution. The 12 & 14 Mile Creek basin is located in Lexington County and is the focus of development pressure. It is because of the absence of central sewer that the area remained largely undeveloped but the focal point of much debate and controversy. Initially planned with a treatment facility, Lorick's Ferry, to be built at the convergence of 12 & 14 Mile Creek, the effluent was recommended to discharge into the Saluda River. This alternative, though cost-effective, failed in the face of pressure by local environmental groups.

The alternative's demise created a vacuum for solutions which could fulfill the expectations of the Lower Saluda Corridor Plan, a subsequent planning effort sponsored by the State Water Resources Commission. In 1995, by a combined effort of the Town of Lexington, City of Cayce and the Lexington County Joint Municipal Water and Sewer Commission a solution was agreed upon by which the basin would be sewered by the Town of Lexington and the flow sent to Cayce for treatment. It is expected that this effort will provide the basis for sustained growth for the basin and form the structure for future service provided in the central portion of Lexington County.

In summary, the last remaining elements to the original 208 planning approach will



end or change with this latest update. The updated Water Quality Management Plan will be a policy plan designed to provide a framework for allocation and management decisions on water quality issues. Its policies will be shaped by the changing dynamics of economic conditions and the continuing attention to maintaining the water quality in the Central Midlands Region.

### **Authority And Jurisdiction**

In 1975, the Governor of South Carolina designated CMRPC as the area wide water quality management planning agency for the Columbia Metropolitan and Lake Murray area in accordance with Section 208 of CWA. Section 208 provides guidelines to develop and implement solutions to water quality problems by local and state governments, such as the Department of Health and Environmental Control and the Department of Natural Resources. DHEC, through a memorandum of agreement, has entered into contracts with CMRPC over the years for water quality planning and implementation activities specified as part of the §208 WQMP and their subsequent updates.

### **Current Issues**

Some of the current regional issues discussed in this plan include the following:

1. Groundwater quality - Evident in The 100 Largest Public Water Supplies in South Carolina - 1995, SCDNR, the Central Midlands planning area is fortunate as compared with other parts of the state in that only a small portion of its public drinking water comes from groundwater sources. This means that there is a lesser chance that drinking water supplies will be affected by groundwater contamination and current groundwater sources will be preserved for future use.

2. Individual septic systems - Have the potential for failure if not properly maintained. In the 1990 report, Handling And Disposal of Septage In The Central Midlands Region, CMRPC, it stated that a homeowner typically does not have their system properly maintained until it fails. The study found that 43% of all single family residences and mobile homes in the Central Midlands planning area use septic tank systems.

3. Wetlands protection and enhancement - This natural resource plays an important part in the filtration of sediment and excess nutrients, flood control, species habitat,

recreational opportunities, etc. In South Carolina, 24% of the geographic area of 4.7 million acres is considered wetlands. During the mid-1970s to the mid-1980s, South Carolina lost an estimated 61,000 acres of wetlands.

4. Non-point source (NPS) pollution - NPS pollution poses a significant impact to the water resources of the State. A 1993 Statewide Water Quality Assessment report prepared by SCDHEC found that 13% of the assessed river miles were determined to be only partially supporting or not supporting overall use because of nonpoint source pollution. Recent studies by the EPA (1993) indicate that most of the remaining water quality impairments to the nation's rivers, streams, and lakes result from non-point sources. Non-point sources of water pollution are those that cannot be traced to a specific discharge such as stormwater runoff from agricultural or urban land uses.

## **Planning Framework**

The planning framework is composed of three parts: principles, goals and policies. As will be described in more detail principles provide the framework using mutually accepted assumptions. Goals and policies are a further refinement of these assumptions, specifically outlining approaches and directions for fulfilling the intent of the principles.

### **Principles**

Principles are fundamental assumptions that provide a point of departure for the analysis or discussion of an issue. The following principles are the foundation for a comprehensive water quality management program in the Central Midlands planning area:

1. Good water quality is important to the health, safety and welfare of the citizens of the region.
2. Water quality is vulnerable to incremental and cumulative effects of development.
3. Water resources cannot be managed separately from the land resource; the two are linked.
4. Clean water enhances the overall "livability" of the region and helps to attract economic development.

5. Fewer large point source discharges are better than many small ones; they are more efficient, both financially and managerially.

6. Regional public wastewater systems are preferred over small private systems.

## **Goals**

Goals are the end results of a directed effort. Goals reflect the vision and aspirations that a community has for the future. Goals are achieved when the regional policies are built upon the underlying principles discussed above.

1. To plan and develop a timely, orderly and efficient arrangement of public sewer facilities and services to serve as a framework for urban and rural development in the Central Midlands planning area.

2. To establish regional policies in order to help maintain and improve the quality of water resources of the Central Midlands planning area.

3. To restore, protect, develop, and enhance the natural, scenic, historical, economic, and recreational qualities of lands with critical natural resources, including without limitation, wetlands, wildlife and fisheries habitat, shorelands, scenic vistas, and unique natural areas.

4. To promote the efficient management of water and wastewater distribution and collection systems through the elimination or consolidation of discharges and treatment facilities.

## **Policies**

Policies are the building blocks used to construct the water management plan and to reach the plan's goals. Policies provide a common, consistent basis for making decisions. Regional plan policies discussed in Part IV include the use of biosolids; the elimination of discharges; the location, sizing, staging, and level of treatment; the use of population forecasts; the use of septic tanks; stormwater management; Total Maximum Daily Load or "TMDL" allocation; water reuse; maintaining the water supply; and wetlands.

## Plan Components

There are two types of water plans – *output* plans and *process* plans. An *output* plan is a technical blueprint, specifying the quantity of water needed, construction schedules for treatment facilities, and financing alternatives for local governments. The *output* plan is inflexible. A *process* type plan defines general policies and goals and sets in motion an ongoing process. A *process* plan has inherent flexibility. It is a plan that can easily accommodate changing conditions.

This update of the WQMP is a departure from previous plans. The earlier plans were *output* type plans - inflexible in their implementation. They were incapable of changing nor did they provide a common, consistent basis for rational decisionmaking. This update of the plan will provide the necessary elements for decisionmakers to provide consistency for water and sewer planning activities.

This document is divided into six sections which include a explanation of the overall water quality framework including a general description of the planning area, institutional designations and responsibilities, administrative procedures, regional policies, basin management and plan implementation.

## 2. REGIONAL FRAMEWORK

### General Description of The Region

#### Physical Setting & Location

The Central Midlands planning area of South Carolina consists of four counties located near the geographical center of the state; Fairfield, Lexington, Newberry, and Richland. The Columbia urban area is the largest urban complex in the region, and also the largest in South Carolina. The region accounts for about 9% of the State's total area or approximately 1,852,570 acres (749,733 ha.). The surface area for each county is:

| <u>County</u> | <u>in Acres</u> | <u>in Hectares</u> |
|---------------|-----------------|--------------------|
| Fairfield     | 455,323         | 184,269            |
| Lexington     | 486,222         | 196,773            |
| Newberry      | 415,486         | 168,147            |
| Richland      | 495,539         | 200,544            |

Source: South Carolina Statistical Abstract - 1993

The region is divided by several major interstate highway corridors: Interstate Routes 20, 26, and 77. Major metropolitan areas within easy driving distance of Columbia include Charlotte, NC (92 miles or 148 kilometers), and Atlanta, GA (215 miles or 346 km).

#### Topography & Geography

The Central Midlands planning area is located nearly equidistant between the Blue Ridge Mountains and the Atlantic Coast. The region falls within two broad physiographic provinces; the Southern Piedmont, and the Coastal Plain. In the Midlands, the Coastal Plain can be further divided into the Carolina-Georgia Sandhills and the Southern Coastal Plain.

The Southern Piedmont has gently undulating to rolling land surfaces which are dissected by numerous streams, typically with dendritic drainage patterns. The Piedmont terrain in the Midlands has gently to moderately steep slopes. The elevations range from 300 feet (91 meters) above mean sea level (MSL) near the Coastal Plain to 810 feet (247 meters) at the top of Little Mountain in Newberry

County. The uppermost portions of Lexington and Richland Counties and all of Fairfield and Newberry Counties are within the Southern Piedmont area. The remainder of the region, with the exception of the southernmost portion of Richland County, is considered Carolina-Georgia Sandhills. This area is characterized by excessively drained sand with gentle to moderate slopes. The elevations range from approximately 250 to 300 feet (76 to 91 meters) above sea level.

The lowest portion of Richland County is considered Southern Coastal Plain. Elevations normally occur in the 100 to 270 foot range (30 to 82 meters); the lowest occurring in the Congaree Swamp with an elevation of 80 feet (24 meters) above MSL. The topography is gently sloping.

### **Land Cover & Land Use**

In addition to the urbanized areas in each county, the Central Midlands planning area includes a variety of land cover types including several broad forest types - bottomland, evergreen, mixed, and deciduous - nonforested wetlands/marsh, agricultural/ grassland, barren/disturbed and water. Table 1 on page 16 shows the number of acres found in each category. Table 2 shows the number of acres of public lands and its percentage of all land in the Midlands. Examples of public land are Sumter National Forest (Newberry and Fairfield Counties), Congaree Swamp National Monument (Richland County), and Harbison State Forest and Sesquicentennial State Park (Richland County). Fairfield County is the single most heavily forested county in the state; approximately 395,000 acres or 86.7% of the county's area is forested.

Additional information on land uses and land cover can be found in the Columbia Metropolitan Water Quality Management Plan, Technical Report No. 2: Inventories & Projections (Central Midlands Regional Planning Council, Columbia, SC, July 1978).

### **Basin Descriptions**

There are three major river basins which influence water quality management planning in the Central Midlands planning area: Saluda-Edisto, Catawba-Santee, and the Broad.

#### **Saluda-Edisto**

The Saluda-Edisto River Basin is actually two separate river basins - they do not connect. The Saluda River "sub-basin" is located in the northwestern part of the state extending southeast to its end at the confluence with the Broad River near Columbia,



thence forming the Congaree River. The drainage basin encompasses portions of 12 South Carolina counties including Newberry, Lexington, and Richland. See page 15 for a general location map. Major tributaries drained by the Saluda include the Little River and the Bush River, both located in Newberry County. Streamflows on the lower portion of the river are modified by two hydroelectric dams, creating Lake Greenwood and Lake Murray.

The Edisto River "sub-basin" is located in south-central South Carolina. The drainage area for the North Fork of the Edisto includes the southwestern portion of Lexington County. Much of the Edisto River sub-basin corresponds with vast wetland areas. Major tributaries to the North Fork include Black Creek and Bull Swamp Creek, located in Lexington County.

### **Catawba-Santee**

At its confluence with Big Wateree Creek in Fairfield County, the Catawba changes in name to the Wateree River. See page 20 for a location map. Tributaries in the Central Midlands planning area drained by the Catawba-Wateree River include Wateree Creek and Dutchman Creek in Fairfield County; and Rice, Twentyfive Mile, and Spears Creeks in Richland County. Streamflows are affected by dams at Fishing Creek Reservoir and Wateree Lake. In addition, formerly the US Natural Resource Conservation Service has completed two flood control projects; one at Fishing Creek in York County, and one at Wateree Creek in Fairfield County. There are several other water development projects occurring outside the Central Midlands planning area.

At the confluence of the Wateree and Congaree Rivers at the southernmost point of Richland County, the Santee River is formed. The Santee River's streamflow has been extensively modified, diverted, and rediverted by the US Army Corps of Engineers.

### **Broad**

The Broad River Basin dominates the central Piedmont section of South Carolina. Sharing a long northern border with North Carolina, the basin tapers in a southeasterly direction and terminates at the confluence with the Saluda River near Columbia to form the Congaree River. See page 21 for a location map. The basin encompasses all or portions of 11 South Carolina counties including portions of all the Central Midlands' counties. The Broad River Basin is also the most populated of all the basins. It encompasses several of the state's larger urbanized areas including Greenville, Spartanburg, and Columbia. Major tributaries to the Broad River include the Pacolet, Tyger, and Enoree Rivers. Some smaller tributaries originating in the Central Midlands planning area include Little River and Cedar Creek, Fairfield County; Indian, Kings, and Cannons Creeks in Newberry County; and Crane Creek in Richland County.

TABLE 1: CENTRAL MIDLANDS PLANNING AREA LAND USE/LAND COVER BY COUNTY (IN ACRES), 1990.

| COUNTY        | EVERGRN<br>FOREST | DECIDUOUS<br>FOREST | MIXED<br>FORES. | SCRUB/<br>SHRUB | SATURATED<br>BOTTOMLAND<br>FOREST | NONFORESTED<br>WETLAND/<br>MARSH | AGRICULTURE/<br>GRASSLAND | BARREN/<br>DISTURBED | URBAN<br>BUILT-UP<br>LAND | WATER    | COUNTY<br>TOTAL |
|---------------|-------------------|---------------------|-----------------|-----------------|-----------------------------------|----------------------------------|---------------------------|----------------------|---------------------------|----------|-----------------|
| FAIRFIELD     | 175,404.0         | 1,307.0             | 217,843         | 13,178.0        | 346.0                             | 0.0                              | 21,856.0                  | 974.0                | 7,225.0                   | 17,190.0 | 455,323.0       |
| LEXINGTON     | 140,340.0         | 6,242.0             | 100,536         | 31,804.0        | 9,550.0                           | 0.0                              | 80,272.0                  | 2,017.0              | 73,284.0                  | 42,077.0 | 486,222.0       |
| NEWBERRY      | 42,588.0          | 2,743.0             | 245,969         | 27,264.0        | 268.0                             | 0.0                              | 70,483.0                  | 625.0                | 13,790.0                  | 11,857.0 | 415,486.0       |
| RICHLAND      | 126,006.0         | 658.0               | 174,903         | 12,608.0        | 51,215.0                          | 38.0                             | 42,668.0                  | 1,293.0              | 70,358.0                  | 15,791.0 | 495,539.0       |
|               |                   |                     |                 |                 |                                   |                                  |                           |                      |                           |          |                 |
| REGION TOTALS | 484,338.0         | 10,950.0            | 739,251         | 84,854.0        | 61,379.0                          | 38.0                             | 215,279.0                 | 4,909.0              | 164,657.0                 | 86,915.0 | 1852570         |

Source: South Carolina Statistical Abstract, 1993

TABLE 2: STATE AND FEDERAL OWNED LANDS IN THE CENTRAL MIDLANDS PLANNING AREA (IN ACRES), 1986.

| COUNTY        | ALL LAND (1) | TOTAL PUBLIC LAND | STATE    | FEDERAL   | % PUBLIC LAND |
|---------------|--------------|-------------------|----------|-----------|---------------|
| FAIRFIELD     | 438,425.0    | 19,046.0          | 7,155.0  | 11,891.0  | 4.3           |
| LEXINGTON     | 452,480.0    | 13,375.0          | 13,373.0 | 2.0       | 3.0           |
| NEWBERRY      | 405,517.0    | 63,400.0          | 8,063.0  | 55,337.0  | 15.6          |
| RICHLAND      | 487,411.0    | 93,905.0          | 23,801.0 | 70,104.0  | 19.3          |
|               |              |                   |          |           |               |
| REGION TOTALS | 1,783,833.0  | 189,726.0         | 52,392.0 | 137,334.0 | 10.6 %        |



Two mainstream impediments to streamflow on the Broad is Parr Dam and Reservoir located 26 miles northwest of Columbia and the Columbia Canal.

The Parr Reservoir was constructed in 1914 for hydroelectric production and remains in use today. The 4,400 acre lake also serves the recreational needs of the local population.

Another stream modification occurs at the Columbia Canal. Now inactive, this navigation project was constructed in the early 1800's and used heavily by barge traffic during the mid-1800's. As the railroad gained in popularity, transportation on the canal decreased and it fell into disrepair. In the 1890's, the canal was repaired and a hydroelectric facility was constructed near its southern end. The canal and hydroelectric plant are still in use today. The City of Columbia also uses the canal as a source of municipal water supply.

Table 3: Central Midlands Planning Area - Drainage Basins & Watersheds

| Basin Name     | Basin # | Sub-Basin Name | Sub-Basin # | Watershed Name                           | Watershed # | Counties                  | Classification |
|----------------|---------|----------------|-------------|--|-------------|---------------------------|----------------|
| Broad          | 0305    | Broad          | 0106        | Broad R. & tribs.                        | 047         | Fld.                      | FW             |
|                |         |                |             | Sandy R. & tribs.                        | 063         | Fld.                      | FW             |
|                |         |                |             | Broad R. & tribs.                        | 096         | Fld., Nwby.               | FW             |
|                |         |                |             | Lower Broad R. & tribs.<br>(Crane Creek) | 130         | Fld., Lex., Nwby<br>Rich. | FW             |
|                |         |                |             | Little R. & tribs.                       | 088         | Fld., Rich.               | FW             |
|                |         |                |             | Jackson Cr. & tribs.                     | 112         | Fld.                      | FW             |
|                |         |                |             | Cedar Cr. & tribs.                       | 125         | Fld., Rich.               | FW             |
|                |         |                |             | Tyger R. & tribs.                        | 045         | Nwby.                     | FW             |
|                |         |                |             | S. Fork Duncan Cr. & tribs.              | 099         | Nwby.                     | FW             |
|                |         |                |             | Lower Enoree R. & tribs.                 | 102         | Nwby.                     | FW             |
| Catawba-Santee | 0305    | Catawba        | 0103        | Cane Cr. & tribs.                        | 025         | Fld.                      | FW             |
|                |         |                |             | Rocky Cr. & tribs.                       | 065         | Fld.                      | FW             |
|                |         |                |             | Waterce Lk. & tribs.                     | 089         | Fld.                      | FW             |
|                |         |                |             | Big Waterce Cr. & tribs.                 | 097         | Fld.                      | NC             |
|                |         |                |             | Waterce R. & tribs.                      | 115         | Rich.                     | FW             |
|                |         |                |             | Swaney's Cr. & tribs.                    | 122         | Fld.                      | NC             |
|                |         |                |             | Twenty-five Mile Cr. & tribs.            | 128         | Fld., Rich.               | FW             |
|                |         |                |             | Spears Cr. & tribs.                      | 138         | Rich.                     | FW             |
|                |         |                |             | Colonels Cr. & tribs.                    | 149         | Rich.                     | NC             |
|                |         |                |             |  |             |                           |                |

Note: Watershed numbers coincide with Watershed Map on page 24.

Table 3: Central and Eastern Planning Area - Drainage Basins & Watersheds (Continued)

| Basin Name    | Basin # | Sub-Basin Name | Sub-Basin | Watershed Name                                    | Watershed # | Counties    | Classification |
|---------------|---------|----------------|-----------|---|-------------|-------------|----------------|
| Saluda-Edisto | 0305    | Upper Saluda   | 0109      | Saluda R. & tribs. (Lk. Greenwood)                | 085         | Nwby.       | FW             |
|               |         |                |           | Saluda R. & tribs.                                | 106         | Nwby.       | FW             |
|               |         |                |           | Little R. & tribs.                                | 117         | Nwby.       | FW             |
|               |         |                |           | Lk. Murray tribs.                                 | 135         | Lex., Nwby. | FW             |
|               |         |                |           | Hollow Cr. & tribs.                               | 163         | Lex.        | FW             |
|               |         |                |           | Lower Saluda R. & tribs.<br>(12 & 14 Mile Creeks) | 145         | Lex.        | FW             |
|               |         |                |           | Congaree R. & tribs.                              | 164         | Lex., Rich. | FW             |
|               |         |                |           | Congaree Cr. & tribs.                             | 166         | Lex.        | FW             |
|               |         |                |           | Gills Cr. & tribs.                                | 148         | Rich.       | FW             |
|               |         |                |           | Sandy Run & tribs.                                | 183         | Lex.        | NC             |
|               |         | Edisto         | 0203      | Cedar Cr. & tribs.                                | 158         | Rich.       | FW             |
|               |         |                |           | Toms Cr. & tribs.                                 | 169         | Rich.       | FW             |
|               |         |                |           | Congaree R. & tribs.                              | 172         | Rich.       | FW             |
|               |         |                |           | Upper N. Fork Edisto R. & tribs.                  | 173         | Lex.        | FW             |
|               |         |                |           | N. Fork Edisto R. & tribs.                        | 185         | Lex.        | FW             |
|               |         |                |           | Black Cr. & tribs.                                | 175         | Lex.        | NC             |
|               |         |                |           | N. Fork Edisto R. & tribs.                        | 186         | Lex.        | FW             |
|               |         |                |           | Bull Swamp Cr. & tribs.                           | 187         | Lex.        | FW             |

Source: Statewide Water Quality Assessment, SCDHEC, 1994, and Classified Waters, Regulations 61-69, SCDHEC.

Notes: FW = Freshwater, See Table 4, Page 30; NC = Not Classified; Ed = Fairfield, Lex = Lexington, Nwby = Newberry, Rich = Richland.

## Water Resources: Opportunities & Constraints

The State of South Carolina has been blessed with an abundance of water resources. History shows that water has seldom been a limiting factor in the development of the state's economy. The state's population, however, is growing more rapidly and becoming more concentrated; this places an increasing burden on water supplies as suggested by Figure 1. An increase in the state's economic base suggests that an adequate supply of usable water at the right time and in the right place cannot be taken for granted.

Opportunities for utilizing the water resources of the Midlands Region are numerous due to the many rivers, lakes, and streams. Most municipalities' public drinking water comes from surface waters of the state. Recreational opportunities include the Lower Saluda River (canoeing and kayaking), and Lake Murray (boating, swimming, and fishing). The Congaree River and Riverfront Park offers the Midland's residents a land/water corridor ("riparian zone") for biking, picnicking, wildlife habitat, fishing, viewing nature, and other scenic and aesthetic amenities. Land use planning by the SC Department of Natural Resources has been implemented in the Lower Saluda River corridor in order to protect the natural characteristics of this river segment that is considered unique to many. The Congaree Vista (Riverfront) Project and the efforts of *The River Alliance* is another example of local planning in order to create an harmonious blend of natural resources conservation and development of the riparian land along the Congaree River.

Clearly, a community can reap economic and social benefits if its water resources are properly managed. On the other hand, water resources can become a liability if neglected or if a community permits a conflicting land use adjacent to a water body.

Surface water also offers man a method of disposing of treated waste effluent through its assimilative capacity-- its ability to dilute such waste to a point where it is no longer a threat to human health. Exceeding that capacity means that greater controls over land uses and pollutant dischargers may be necessary; leading to greater costs.

## Public Water Systems

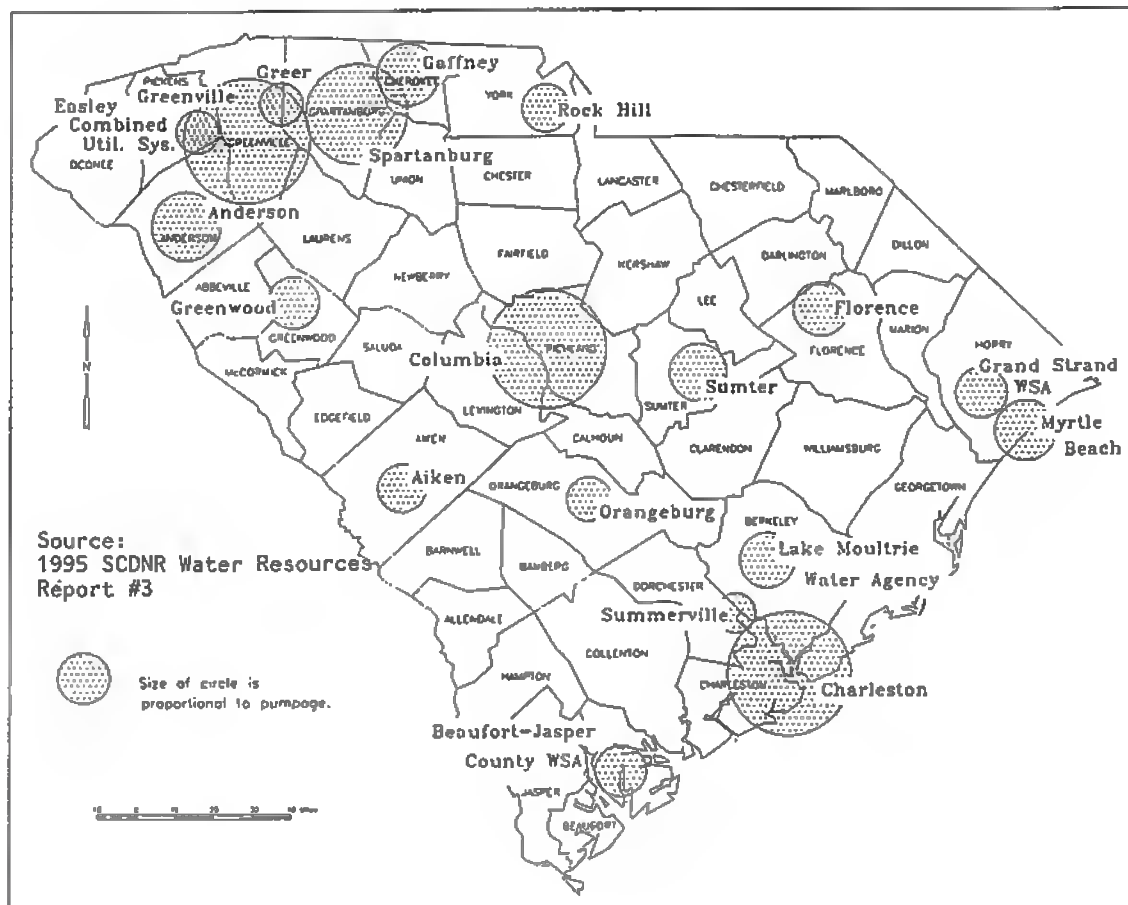
The following charts show water use by the 9 largest water systems in the region. The information was obtained from the 1995 SCDNR Water Resources Report #3. Most of the items are self-explanatory, but a few may need clarification. The term "population served" refers to the total population that obtains water from the system, plus any smaller systems which purchase water from the named system. Thus, the population shown under a town name may appear much larger than the town's actual size. In connection with this, it is important to note whether a water system produces its own water supply or purchases it from another system.

Under "Treatment", several code letters identify the types of treatment used. They are:

- B - Disinfection by-products control
- C - Corrosion control
- D - Disinfection
- F - Iron removal
- I - Inorganic removal
- N - No treatment at source
- P - Particulate removal
- S - Softening
- T - Taste/odor control
- Z - Fluoridation

The storage capacity listed includes elevated (EL), ground (GR), and pressure tank (PT); storage capacity is in millions of gallons.

Figure 1: Statewide System Demand For Public Water - 1996



---

State Rank in Size:3

**CITY OF COLUMBIA**  
(Richland County)

|                   |  |                    |          |
|-------------------|--|--------------------|----------|
| Source of Supply: | Broad River (Columbia Canal) and Lake Murray |                    |          |
| Average Pumpage:  | 47 mgd                                       | Population Served: | 255,277  |
| Plant Capacity:   | 90 mgd                                       |                    |          |
| Treatment:        | C,D,P,Z                                      | Storage Capacity:  | 13.50 EL |
|                   |  | (million gallons)  | 19.30 GR |
|                   |  |                    | 00.00 PT |
| Per Capita Use:   | 184 gpd                                      |                    |          |
| Remarks:          | 3 mgd sold to Fort Jackson.                  |                    |          |

---

State Rank in Size:20

**CITY OF WEST COLUMBIA**  
(Lexington County)

|                   |                                       |                    |         |
|-------------------|---------------------------------------|--------------------|---------|
| Source of Supply: | Saluda River and Lake Murray          |                    |         |
| Average Pumpage:  | 4.9 mgd                               | Population Served: | 38,507  |
| Plant Capacity:   | 12 mgd                                |                    |         |
| Treatment:        | C,D,P,T,Z                             | Storage Capacity:  | 6.00 EL |
|                   |                                       | (million gallons)  | 3.37 GR |
|                   |                                       |                    | 0.00 PT |
| Per Capita Use:   | 126 gpd                               |                    |         |
| Remarks:          | About .5 mgd sold to smaller systems. |                    |         |

---

State Rank in Size:26

**CITY OF NEWBERRY**  
(Newberry County)

|                   |                                       |                    |         |
|-------------------|---------------------------------------|--------------------|---------|
| Source of Supply: | Saluda River                          |                    |         |
| Average Pumpage:  | 3.5 mgd                               | Population Served: | 18,642  |
| Plant Capacity:   | 7.92 mgd                              |                    |         |
| Treatment:        | C,D,P,T                               | Storage Capacity:  | 1.50 EL |
|                   |                                       | (million gallons)  | 2.50 GR |
|                   |                                       |                    | 0.00 PT |
| Per Capita Use:   | 187 gpd                               |                    |         |
| Remarks:          | About .5 mgd sold to smaller systems. |                    |         |

---

---

State Rank in Size:28

**CITY OF CAYCE**  
**(Lexington County)**

|                   |                |                    |         |
|-------------------|----------------|--------------------|---------|
| Source of Supply: | Congaree Creek | Population Served: | 22,850  |
| Average Pumpage:  | 3.2 mgd        |                    |         |
| Plant Capacity:   | 6.4 mgd        |                    |         |
| Treatment:        | C,D,P,Z        | Storage Capacity:  | 4.22 EL |
|                   |                | (million gallons)  | 1.50 GR |
|                   |                |                    | 0.00 PT |
| Per Capita Use:   | 140 gpd        |                    |         |
| Remarks:          |                |                    |         |

---

State Rank in Size:30

**FORT JACKSON (US ARMY)**  
**(Richland County)**

|                   |                         |                    |         |
|-------------------|-------------------------|--------------------|---------|
| Source of Supply: | Purchased from Columbia | Population Served: | 19,804  |
| Average Pumpage:  | 3.0 mgd                 |                    |         |
| Plant Capacity:   | 6.55 mgd                |                    |         |
| Treatment:        | By Columbia             | Storage Capacity:  | 2.00 EL |
|                   |                         | (million gallons)  | 0.00 GR |
|                   |                         |                    | 0.00 PT |
| Per Capita Use:   | 153 gpd                 |                    |         |
| Remarks:          |                         |                    |         |

---

State Rank in Size:71

**TOWN OF LEXINGTON**  
**(Lexington County)**

|                   |                   |                    |         |
|-------------------|-------------------|--------------------|---------|
| Source of Supply: | Twelve Mile Creek | Population Served: | 19,804  |
| Average Pumpage:  | 3.0 mgd           |                    |         |
| Plant Capacity:   | 6.55 mgd          |                    |         |
| Treatment:        | C,D,P,T,Z         | Storage Capacity:  | 0.55 EL |
|                   |                   | (million gallons)  | 0.75 GR |
|                   |                   |                    | 0.00 PT |
| Per Capita Use:   | 237 gpd           |                    |         |
| Remarks:          |                   |                    |         |

---

**TOWN OF WINNSBORO**  
**(Fairfield County)**

|                   |  |                    |         |
|-------------------|--|--------------------|---------|
| Source of Supply: | 192-Acre Lake and Sand Creek           |                    |         |
| Average Pumpage:  | 1.2 mgd                                | Population Served: | 10,331  |
| Plant Capacity:   | 3.1 mgd                                |                    |         |
| Treatment:        | B,C,D,P,Z                              | Storage Capacity:  | 1.22 EL |
|                   |  | (million gallons)  | 1.31 GR |
|                   |  |                    | 0.00 PT |
| Per Capita Use:   | 116 gpd                                |                    |         |
| Remarks:          | About .25 mgd sold to smaller systems. |                    |         |

**BATESBURG-LEESVILLE**  
(Lexington County)

|                   |   |                    |         |
|-------------------|---|--------------------|---------|
| Source of Supply: | Lightwood Knot and Duncan Creeks        |                    |         |
| Average Pumpage:  | 1.1 mgd                                 | Population Served: | 7,948   |
| Plant Capacity:   | 2.1 mgd                                 |                    |         |
| Treatment:        | C,D,F,P,T,Z                             | Storage Capacity:  | 0.35 EL |
|                   |   | (million gallons)  | 1.00 GR |
|                   |   |                    | 0.00 PT |
| Per Capita Use:   | 138 gpd                                 |                    |         |
| Remarks:          | About 125,000 gpd sold to Ridge Spring. |                    |         |

**NEWBERRY COUNTY WATER & SEWER AUTHORITY**  
(Newberry County)

|                   |  |                    |         |
|-------------------|--|--------------------|---------|
| Source of Supply: | Purchased from Newberry; and eight wells in Paleozoic rock |                    |         |
| Average Pumpage:  | 0.9 mgd  | Population Served: | 7,619   |
| Plant Capacity:   | 2.04 mgd   |                    |         |
| Treatment:        | D  | Storage Capacity:  | 1.10 EL |
|                   |  | (million gallons)  | 2.00 GR |
|                   |  |                    | 0.00 PT |
| Per Capita Use:   | 120 gpd  |                    |         |
| Remarks:          |  |                    |         |



## Water Quality Assessment And Segment Classification

In an effort to evaluate the State's water quality, the Department of Health and Environmental Quality Control operates a permanent statewide network of primary ambient monitoring stations and flexible, rotating secondary and watershed monitoring stations. The ambient monitoring network is directed towards determining long-term water quality trends, identifying locations in need of additional monitoring efforts, and providing background data for planning and evaluating stream classifications and standards.

The monitoring data are also used in the process of formulating permit limits for wastewater discharges with the goal of maintaining State and Federal water quality standards and criteria in the receiving streams. These standards and criteria define the instream parameter concentrations which provide for protection and reproduction of aquatic flora and fauna, support the use classification of each waterbody, and serve as instream limits for the regulation of wastewater discharges or other activities. In addition, the data are used in the preparation of the biennial §305(b) report to Congress, which summarizes State waters with respect to use classification attainment by comparing the ambient monitoring network data to the State Water Quality Standards.

There are three classes of freshwaters identified by South Carolina regulations under "Water Classifications and Standards". Each classification consists of two parts: classified uses which must be protected, and water quality standards stringent enough to protect these uses. A description of these classes can be found in Table 4 on the following page.

In general, the quality of surface water resources (rivers & streams) in the Central Midlands planning area is mixed. Only 47% of the total river and stream miles assessed fully support overall use, including aquatic life use, recreational use, drinking water supply, and agricultural use. Table 5 lists the major watersheds within the Central Midlands planning area and the number of miles of full-support, partial-support, or non-support of overall use. The number of miles that either partially support or do not support overall use represents 53% of the total miles surveyed with an additional 1,088 miles that have not been assessed. Table 5 also lists the probable causes and sources of those segments with partial- or non-support. Several exceptional stream segments should be noted because the entire lengths fully support overall uses: Toms Creek in lower Richland County; and Black Creek in Lexington County.

**Table 4: Freshwater Classifications**

| Class                         |      | Description  |
|-------------------------------|------|--|
| 1. Outstanding Resource Water | ORW  | Freshwaters or saltwaters which constitute an outstanding recreational or ecological resource or those freshwaters suitable as a source for drinking water supply purposes with treatment levels specified by the Department.  |
| 2a. Trout - Natural           | TN   | Freshwaters suitable for supporting reproducing trout populations and a cold water balanced indigenous aquatic community of fauna and flora. Suitable also for uses listed in Freshwaters.   |
| 2b. Trout - Put, Grow, & Take | TPGT | Freshwaters suitable for supporting growth of stocked trout populations and a balanced indigenous aquatic community of fauna and flora. Suitable also for uses listed in Freshwaters.  |
| 3. Freshwaters                | FW   | Freshwaters suitable for primary and secondary contact recreation and as a source for drinking water supply after conventional treatment in accordance with the requirements of the Department. Suitable for fishing and the survival and propagation of a balanced indigenous aquatic community of fauna and flora. Suitable also for industrial and agricultural uses. |

Source: Water Classifications and Standards, SC DHEC, 1993.

Table 5: Riverine Summary Data - Use Support Levels in Miles

| Watershed Name                           | Watershed # | Full Support | Partial Support | Non-Support | Not Assessed | Cause                        | Source                   |
|--|-------------|--------------|-----------------|-------------|--------------|------------------------------|--------------------------|
| Broad R. & tribs.                        | 047         | 14.29        | 0.02            | 57.08       | 0.0          | Pathogens                    | Industrial point sources |
| Sandy R. & tribs.                        | 063         | 7.4          | 0.0             | 119.43      | 0.0          | Pathogens                    | NPS-runoff               |
| Broad R. & tribs.                        | 096         | 65.96        | 5.46            | 0           | 125.83       | Pathogens                    | Industrial point sources |
| Lower Broad R. & tribs.<br>(Crane Creek) | 130         | 0.0          | 101.23          | 52.69       | 40.11        | Pathogens                    | Industrial point sources |
| Little R. & tribs.                       | 088         | 0.0          | 17.69           | 112.62      | 0.0          | Pathogens                    | Agricultural NPS         |
| Jackson Cr. & tribs.                     | 112         | 0.0          | 0.0             | 48.05       | 0.0          | Pathogens                    | Agricultural NPS         |
| Cedar Cr. & tribs.                       | 125         | 0.0          | 109.41          | 0.0         | 0.0          | Pathogens                    | Industrial point sources |
| Tyger R. & tribs.                        | 045         | 36.79        | 0.0             | 119.42      | 6.92         | Pathogens                    | Industrial point sources |
| S. Fork Duncan Cr. & tribs               | 099         | 0.0          | 0.0             | 21.42       | 0.41         | Pathogens                    | Municipal point sources  |
| Lower Enoree R. & tribs.                 | 102         | 0.0          | 0.0             | 117.98      | 2.85         | Pathogens                    | Industrial point sources |
| Cane Cr. & tribs.                        | 025         | 0.0          | 0.0             | 248.76      | 7.66         | Pathogens & excess nutrients | Run-off                  |
| Rocky Cr. & tribs.                       | 065         | 0.0          | 0.0             | 139.13      | 31.51        | Pathogens                    | NPS                      |
| Wateree Lk. & tribs.                     | 089         | 17.06        | 0.0             | 0.0         | 376.14       |                              |                          |
| Big Wateree Cr. & tribs.                 | 097         | 1.94         | 0.0             | 0.0         | 60.95        |                              |                          |
| Wateree R. & tribs.                      | 115         | 538.98       | 0.0             | 71.05       | 0.0          | Nutrients                    | NPS                      |
| Swaney's Cr. & tribs.                    | 122         | 30.03        | 0.0             | 77.41       | 0.0          | Pathogens                    | NPS-pasture              |
| Twenty-five Mile Cr. & tribs             | 128         | 17.03        | 228.13          | 3.5         | 0.0          | Pathogens                    | NPS-urban                |
| Spears Cr. & tribs.                      | 138         | 71.42        | 29.16           | 28.7        | 0.0          | Pathogens                    | Industrial point sources |
| Colonels Cr. & tribs.                    | 149         | 91.18        | 0.02            | 0.0         | 0.0          | Pathogens                    | Industrial point sources |

Table 5: Riverine Summary Data - Use Support Levels in Miles (Continued)

| Watershed Name                                 | Watershed # | Full Support | Partial Support | Non-Support | Not Assessed | Cause                          | Source                                |
|--|-------------|--------------|-----------------|-------------|--------------|--------------------------------|---------------------------------------|
| Saluda R. & tribs. (Lk. Greenwood)             | 085         | 110.83       | 0.96            | 0.0         | 183.01       | Nutrients                      | NPS-runoff                            |
| Saluda R. & tribs.                             | 106         | 29.89        | 37.06           | 80.98       | 92.57        | Pathogens                      | Municipal point sources               |
| Little R. & tribs.                             | 117         | 62.19        | 0.0             | 20.37       | 0.0          | Pathogens                      | Pasture land runoff                   |
| Lk. Murray tribs.                              | 135         | 0.0          | 0.0             | 8.71        | 73.91        | Pathogens                      | Pasture land runoff                   |
| Hollow Cr. & tribs.                            | 163         | 0.08         | 0.0             | 17.75       | 1.36         | Pathogens                      | Source unknown                        |
| Lower Saluda R. & tribs. (12 & 14 Mile Creeks) | 145         | 0.0          | 91.12           | 16.43       | 0.31         | Pathogens & metals             | Municipal point sources               |
| Congaree R. & tribs.                           | 164         | 246.36       | 9.04            | 4.71        | 4.4          | Pathogens & turbidity          | Municipal point sources               |
| Congaree Cr. & tribs.                          | 166         | 38.26        | 119.12          | 0.0         | 0.0          | Pathogens, metals, & turbidity | Construction                          |
| Gills Cr. & tribs.                             | 148         | 27.84        | 0.67            | 23.67       | 63.64        | Organics & pathogens           | Contaminated sediments & urban runoff |
| Sandy Run & tribs.                             | 183         | 52.19        | 0.0             | 0.0         | 2.33         |                                |                                       |
| Cedar Cr. & tribs.                             | 158         | 145.26       | 38.91           | 0.0         | 0.0          | Pathogens                      | Municipal point sources               |
| Toms Cr. & tribs.                              | 169         | 69.34        | 0.0             | 0.0         | 0.0          |                                |                                       |
| Congaree R. & tribs.                           | 172         | 84.93        | 0.0             | 0.0         | 12.78        |                                |                                       |
| Upper N. Fork Edisto R. & tribs.               | 173         | 64.29        | 0.0             | 33.92       | 0.0          | Pathogens                      | Agricultural NPS                      |
| N. Fork Edisto R. & tribs.                     | 185         | 32.18        | 0.0             | 100.76      | 0.0          | Metals                         | Source unknown                        |
| Black Cr. & tribs.                             | 175         | 80.41        | 0.0             | 0.0         | 0.0          |                                |                                       |
| N. Fork Edisto R. & tribs.                     | 186         | 99.37        | 0.0             | 85.03       | 0.0          | Metals                         | Source unknown                        |
| Bull Swamp Cr. & tribs.                        | 187         | 83.71        | 0.0             | 19.23       | 1.93         | Pathogens & Turbidity          | Municipal point sources               |

Source: Statewide Water Quality Assessment, FY 1992-1993. A Report to Congress Pursuant to Section 305(b) of the Federal Water Quality Act, SCDHEC, Columbia, SC, 1994.

**Table 6: Uses and Use Classifications.**

| Uses                                 | Use Classifications         |
|--------------------------------------|-----------------------------|
| Fish and Wildlife                    | All classes                 |
| Domestic Water Supply                | All Freshwater classes      |
| Primary Contact Recreation           | All classes                 |
| Secondary Contact Recreation         | All classes                 |
| Agriculture                          | All Freshwater classes      |
| Industrial                           | All Freshwater classes      |
| Navigation                           | All classes                 |
| No degradation of existing uses      | All classes                 |
| No degradation of natural conditions | Outstanding Resource Waters |

Source: Statewide Water Quality Assessment, SC DHEC, 1994.

## **Environmental Issues**

An important theme of this plan is the balance between economic development and natural resources preservation. Natural resource preservation should not be construed as anti-development, nor should the term imply pro-environment. It suggests compatibility between the two which provides overall benefits to the well-being of citizens and their communities including social, economic, cultural, and environmental. This principle does not require total mitigation of adverse environmental impacts from development, since any construction would have an impact on the environment. Instead, it suggests that developers be sensitive to the natural environment and either avoid, remedy, or mitigate impacts when feasible. For every development project, there is an opportunity to improve or conserve natural resources.

Information from a resources inventory, such as the one found in the Columbia Metropolitan Water Quality Management Plan (1978) should be utilized to evaluate growth and development in the Midlands Region such as floodplains, critical wildlife habitat, high soil erosion potential, historical landmarks, wetlands, etc.



## **Development Trends**

From 1980 to 1990, the region's population grew by 10.1% from 462,030 to 508,798. Gains since then have been equally impressive. In terms of job creation, the region has also enjoyed growth. From 1980 to 1996, non-farm employment rose by 96,770 or 49% to a regionwide total of 293,220 persons. Driving the increase in population is the economic strength of the urbanized core. Employment in commercial trade and service, government and industry provide the basis for an expanding labor force. To meet this demand, housing construction has consistently risen as a whole in response.

Today, several key areas are engine for continued residential and commercial development: Town of Lexington, Northwest Richland County, Northeast Richland County, South of the Town of Winnsboro and along SC Hwy 76 near the City of Newberry. In each location, the provision of water and sewer coupled with an expanding commercial base has provided growing strength to the region's economy. As noted residential developed has expanded to meet the pressures of demand particularly in Lexington and Richland Counties. Table 8 highlights these trends in housing.

It is forecasted that residential development will continue to expand significantly in Lexington County as regional water and sewer enable higher density development to occur. Richland County is also expected to follow in residential growth with Newberry and Fairfield Counties with lesser gains. Demand for commercial development is also expected to trend residential patterns and expand in all four counties, particularly in the metropolitan area as it gains in strength as the growth center for the central portion of the State.

## **Demographics**

Tables 7 & 8 illustrate the population and housing trends in the Central Midlands planning area. As shown, the largest portion of the population is found in Lexington and Richland Counties; these two counties account for nearly 90% of the region's total population. Long term projections show moderate growth for the region. Most of the population in Fairfield and Newberry Counties is centered around Winnsboro and the City of Newberry, respectively. Residents of these towns and the counties are, however, dependent upon Columbia and its urbanized area for more specialized consumer and medical services.

**Table 7: Population Trends By County, 1980-2010, Source: CMRPC 1996.**

| County                             | 1980    | % change | 1990    | % change | 2000    | 2010    |
|------------------------------------|---------|----------|---------|----------|---------|---------|
| Fairfield                          | 20,700  | + 7.7%   | 22,295  | + 2.7%   | 22,900  | 23,500  |
| Lexington                          | 140,353 | + 19.0 % | 167,611 | +23.0 %  | 201,300 | 232,700 |
| Newberry                           | 31,242  | + 6.2 %  | 33,172  | + 4.6 %  | 34,700  | 36,200  |
| Richland                           | 269,735 | + 6.0 %  | 285,720 | + 13.0 % | 312,600 | 337,100 |
| Total Population<br>(All Counties) | 462,030 | + 10.1 % | 508,798 | + 15.5 % | 571,500 | 629,500 |

**Table 8: New Construction By County, 1992-1995, Source: CMRPC 1996.**

| County       | Type                | 1992  | 1993  | 1994  | 1995  |
|--------------|---------------------|-------|-------|-------|-------|
| Fairfield    | Total Housing units | 66    | 68    | 51    | 51    |
|              | Single family       | 66    | 68    | 51    | 49    |
|              | Multi-family        | 0     | 0     | 0     | 2     |
|              | Nonresidential      | 29    | 29    | 45    | 74    |
| Lexington    | Total Housing units | 1,463 | 1,746 | 1,872 | 1,586 |
|              | Single family       | 1,463 | 1,524 | 1,434 | 1,158 |
|              | Multi-family        | 10    | 222   | 438   | 428   |
|              | Nonresidential      | 312   | 309   | 443   | 359   |
| Newberry     | Total Housing units | 102   | 93    | 164   | 85    |
|              | Single family       | 98    | 93    | 116   | 85    |
|              | Multi-family        | 4     | 0     | 48    | 0     |
|              | Nonresidential      | 33    | 25    | 34    | 40    |
| Richland     | Total Housing units | 1,710 | 2,221 | 1,902 | 2,179 |
|              | Single family       | 1,395 | 1,374 | 1,509 | 1,750 |
|              | Multi-family        | 315   | 847   | 393   | 429   |
|              | Nonresidential      | 615   | 919   | 797   | 839   |
| Region Total | Total Housing units | 3,341 | 4,128 | 3,989 | 3,901 |
|              | Single family       | 3,012 | 3,059 | 3,110 | 3,042 |
|              | Multi-family        | 329   | 1,069 | 879   | 859   |
|              | Nonresidential      | 989   | 1,282 | 1,319 | 1,312 |

## **Institutional Designations And Responsibilities**

### **General**

The institutional relationship between areawide planning and designated management agencies is designed to provide several benefits:

1. Areawide water quality management planning ensures an effective regional water quality management system is maintained. Since planning considers both point and nonpoint sources, local governments can consider the effects of both sources upon their water resource systems;
2. Individual facility permits and plans deal with construction, operation, and maintenance of collection, transport and treatment and places the responsibility for developing a cost effective local wastewater management system on local governments within limits of the regional areawide plan;
3. Assurance that similar activities in adjacent areas are compatible and that it should not be adversely impacted by activities in upstream areas; and
4. Promotes the orderly development of wastewater infrastructure for projected demands and fostering economic development.

The areawide planning process takes a broad perspective related to facility needs, scheduling, treatment levels and setting priorities for needed facilities. Management agencies, in addition to being responsible for implementing the regional plan, determine the need for and specific characteristics of wastewater treatment processes and the details of implementation with the framework of the regional plan.

### **Designated Water Quality Management Planning Agency**

As the designated planning agency, CMCOG is responsible for updating and amending the Areawide Water Quality Management Plan for the four county region. This responsibility includes, and has been limited to, since 1985 recommending needed sewer collection, transport and treatment systems. As part of the planning process, CMCOG signed a Memorandum of Agreement with the SC Department of Health and Environmental Control (DHEC) in 1985. Under this Agreement, CMCOG is responsible for reviewing all sewer projects proposed for construction in the region. This includes collector systems for residential, commercial, or industrial development;



transport or "trunk" lines; and all wastewater treatment systems, including land application.

It is noted in the agreement that CMCOG will specifically:

1. review permits and projects for conformance with the plan;
2. coordinate administrative requirements for amending the plan;
3. coordinate other state agency's certifications of permits;
4. monitor and assess wastewater projects;
5. work with designated management agencies on implementing the plan;
6. revise and update as required the Water Quality Management Plan

### **Environmental Planning Advisory Committee**

The Environmental Planning Advisory Committee (EPAC) is a successor to a former 300 member citizens advisory group which prepared the first water quality plan. The Committee is established by the CMCOG Board and acts in an advisory capacity only. It is composed of 22 voting members, generally representing the principal management agencies, environmental interests and local area citizen groups. The Chairman and Vice-Chairman are appointed by the Chairman of the CMCOG Board.

It is the purpose of the Committee to provide technical support to the Board on water quality issues and their impact on the Areawide Water Quality Management Plan. Issues or items are sent to the Committee by staff or the CMCOG Board as needed for implementing the regional plan. The committee is authorized to undertake needed studies, create working groups and conduct public forums to prepare its recommendations to the Board. Upon completion of its findings, the Committee prepares and submits a recommendation to the CMCOG, which acts and submits its findings to DHEC.

### **Management Agencies**

#### **Eligibility and Authority**

The role of the Management Agency is to implement the Regional Water Quality Management Plan for its designated management area. To become a Management Agency, the agency must be certified or "designated" by the State. In South Carolina, management agencies have been determined by the Attorney General's Office to be limited to municipalities, counties or special purpose districts. Eligibility for management agency status is set out in the Clean Water Act (§ 208(c)) and outlined as follows:

1. The authority to carry out the appropriate portions of the Regional Water Quality Management Plan developed under the Act.

2. The authority to effectively manage wastewater treatment works and related facilities serving the area in conformance with the regional plan;

3. The authority, directly or by contract, to design and construct new works and to operate and maintain new and existing works as required by the regional plan.

4. The authority to accept and utilize grants and funds from other sources for wastewater treatment management purposes. Management agencies, after designation, are the only agencies authorized to receive federal funds, though other agencies may receive funds through designated agencies.

5. The authority to raise revenues, including the assessment of wastewater treatment charges.

6. The authority to incur short- and long-term indebtedness.

7. The authority to assure, in implementation of the wastewater treatment management plan, that each participating community pays its proportionate share of treatment costs.

8. The authority to refuse wastewater for treatment from any municipal or subdivision thereof which does not comply with any provision of the Regional Water Quality Management Plan.

9. The authority to accept industrial wastewater for treatment and manage pretreatment programs.

## **Management Agencies By Watershed**

Provided below is a list of designated management agencies by watershed and county.

### **Saluda-Edisto Watershed**

|                  |                             |                    |
|------------------|-----------------------------|--------------------|
| City of Newberry | Newberry County W & S A     | Town of Chapin     |
| Richland County  | Town of Batesburg-Leesville | Town of Lexington  |
| City of Cayce    | City of West Columbia       | City of Columbia   |
| Town of Swansea  | East Richland PSD           | Town of Eastover   |
| Lexington County | Lexington County JMW & SC   | Town of Springdale |

### **Broad River Watershed**

|                   |                         |                  |
|-------------------|-------------------------|------------------|
| Town of Whitmire  | Newberry County W & S A | City of Newberry |
| Town of Winnsboro | Richland County         | City of Columbia |
| East Richland PSD | Fairfield County        |                  |

### **Catawba-Santee Watershed**

|                   |                  |                  |
|-------------------|------------------|------------------|
| Town of Winnsboro | Fairfield County | Town of Ridgeway |
| Richland County   |                  |                  |

### **3. ADMINISTRATIVE PROCEDURES**

#### **Public Participation**

Public participation in water quality planning activities is encouraged under 40 CFR Part 25 - Public Participation in Programs under the Clean Water Act. Public participation may include public notification, public consultation, public hearings, public meetings, or advisory groups. Part 25 does not mandate the use of these public participation mechanisms; rather it sets requirements for implementing the mechanisms. Under the Freedom of Information Act (Title 30 SCC § 1-10, et seq), meetings of public agencies must be conducted in a public forum and given advance notice of the time and place such meetings will occur. Public hearings and meetings of the CMCOG Board and the Environmental Planning Advisory Committee are open to the public.

Several paths are used to secure public participation for the plan's preparation: 1) organized interests participation through the advisory planning committee, 2) input from the membership of the CMCOG Board, comprising of local elected officials and citizen appointees, 3) solicited comments from area planning commissions and economic development agencies and 4) public meetings.

#### **Plan Amendments**

In the event that a proposal or project is determined to be inconsistent with the WQMP, an application may be made to CMCOG to amend the Plan. Amendments are classified as either major or minor. CMCOG shall determine whether a request is either a major or minor amendment. *All amendments must be sponsored by a Designated Management Agency or the CMCOG Board.*

##### **Major Plan Amendments**

**Major amendments** are defined as the following:

1. New wastewater treatment facilities with a design flow of *1.0 MGD, or >*:
2. Existing WWTFs, which will be expanded by at least 50% of the current design capacity with respect to flow;

3. Changes in management agency status, condition or geographic management area such that the change significantly alters the provision of wastewater collection, transportation, treatment or potentially impairs water quality.

4. Proposed projects which conflict with the goals and objectives of the WQMP, such as those listed below, or specifically stated plan policies would require a plan amendment.

*The consolidation of small, privately owned WWTFs into larger regional WWTFs, owned and operated by designated 208 Management Agencies; or*

*When consolidation is not feasible, not to allow privately owned WWTFs to be expanded above the present permitted levels, unless they are operated and maintained by the designated 208 Management Agency for that planning area; or*

*Requiring central sewer to be used wherever possible, to provide an acceptable method of wastewater treatment and effluent disposal for projected residential, commercial, or industrial growth areas.*

#### **Minor Plan Amendments**

Minor amendments are defined as the following:

1. A new wastewater treatment facility with a design flow *less than* 1.0 MGD;
2. An existing WWTF which would be expanded by less than 50% of the current design capacity with respect to flow;
3. Changes in management agency status, condition or geographic management area such that the change does not significantly alter the provision of wastewater collection, transportation, treatment or potentially impairs water quality.
4. A proposed change in the current effluent disposal method, discharge point, or service area for an existing WWTF, that would be consistent with goals and objectives of the WQMP.

## Review Criteria

A review of the proposal will take into account all relevant information including, but not limited to, the following: cost effectiveness, ability to implement, impact on existing and proposed facilities, existing agreements or contracts, public health, environmental, compatibility with local or state adopted land use or infrastructure plans and economic development. While each criteria is to be considered, its relative weight will be based upon the merits of the each proposed amendment.

## Procedural Requirements

### Process

Once a determination has been made that a plan amendment is required, the applicant shall request in writing to initiate the amendment process. The applicant will also be responsible for all initial submission requirements and any additional information or studies requested during the amendment process by the EPAC or CMCOG. Unless otherwise directed by the Chairman of EPAC with concurrence from the Chairman of CMCOG Board, the Environmental Planning Advisory Committee will review all **proposed major amendments** and submit recommendations to the CMRPC Board for final action. **Proposed minor amendments** may be brought before EPAC at the request of the Chairman before going to the Board. The applicant should be present during the EPAC or Board meetings to discuss or present the amendment and respond to questions. Recommendations from EPAC to the CMCOG are to be one the following:

1. Approval;
2. Approval with Conditions;
3. Denial -- In cases of denial, the applicant may choose to revise their application to conform with the plan.

After the public information meeting, if one is held, all proposed amendments will be placed on the agenda of the Central Midlands Council Board. The EPAC Chairman, assisted by staff, will present the proposed amendment, recommendation of EPAC, and a summary of public comments. The applicant and other parties may be invited to attend the meeting, and may address the issue at the discretion of the Council. Action by the Central Midlands Council of Governments will take one of the following forms:

1. Approval;
2. Approval with Conditions;
3. Denial; or
4. Referred back to EPAC for further study.

DHEC and EPA, where required, must approve all amendments before they become part of the Regional Water Quality Management Plan.

### **Grievances**

Decisions of the Board of the Central Midlands Council of Governments are considered final and are given to the SC Department of Health & Environmental Control for concurrence.

### **Notice and Public Meeting Requirements**

An advertised public information meeting may be held for **any plan amendment** as determined by CMCOG, and will be scheduled following an EPAC recommendation, where required. The meeting may be held in the applicant's jurisdiction or at the offices of the Council. The meeting will be scheduled for a weekday evening and held in a handicapped accessible public building.

Public notice for such meetings will be advertisement published in the newspaper of general circulation in the region at least fifteen (15) days prior to the meeting. The applicant will provide a review copy of the proposal to the Council. The proposal and supporting documentation will be made available for public review during normal business hours. The advertisement will state where these copies are available.

The public information meeting will be conducted by the Chairman of EPAC or his designee and staff of the Council. The applicant should attend the public meeting to assist in responding to questions concerning the proposed amendment. Verbal and written comments will be received at the meeting. Additional written comments may be submitted up to seven (7) days following the public meeting or prior to the next regularly scheduled Council Board meeting.

### **Plan Amendment Submission Requirements**

At a minimum, before an application can receive consideration by CMCOG, the applicant may be required to provide information which, at a minimum where it applies, addresses the following:



1. Detailed description and scope of the project;
2. Preliminary engineering data regarding facility design and cost;
3. Financing strategy and/or feasibility analysis;
4. Potential fiscal or engineering impact on existing facilities, if any;
5. Associated environmental risks or impacts;
6. Project justification or need;
7. Summary examination of alternative options, where appropriate; and
8. Timing and phasing of the project or proposal.

Moreover, the burden of demonstrating the facts and merits of any plan amendment lies solely with applicant and is subject to whatever level of review issued by the CMCOG staff, EPAC or CMCOG Board.

### **Comprehensive Plan Revisions & Annual Plan Updates**

For purposes of distinguishing future changes to the Plan, it is recommended that the Council undertake a comprehensive revision of the Plan every 10 years or when there has been a substantial and fundamental change in conditions in the 208 plan area. Under a comprehensive revision, all aspects of the plan are to revisited for validity and appropriateness. It is required that the CMCOG Board adopt the Plan and that public input has been taken as part of the revision process.

Annual plan updates are to be conducted at the end of each federal fiscal year. As part of the annual update, a summary of all significant changes in the plan will be identified, including a list of all major and minor plan amendments, significant or major shifts in the demographic or geographic characteristics of the region and modifications in the legal framework of the water quality planning process or state regulatory environment.

### **Conformance Reviews**

Before DHEC can issue or re-issue a permit to construct or operate a wastewater treatment facility or related facilities in the 208 planning region, conformance with the Water Quality Management Plan must be determined.

DHEC, engineering consultants, or developers may submit the 208 conformance request form for review and concurrence. Upon receipt of the form, CMCOG staff reviews the information such as location of the project, disposal method, and any recommendations from the current 208 Plan.

Approval is generally granted to projects where it conforms to the plan goals and policies, consistent with the service strategy of the designated management agency and complies with state environmental regulations. Even if a project is not specifically supported by the current 208 Plan, the project may, if appropriate, be approved conditionally with the objective that compliance with the WQMP would follow in a timely manner. If the project is found not to be in conformance with the WQM Plan, the Plan must be amended.

**Page left blank.**

## **4. REGIONAL POLICIES**

### **General**

Certain planning functions and water quality issues require a policy statement to provide a common, consistent basis for making decisions. Roles, functions and regulations have changed since 1985 which require that the WQMP respond to new directions in water quality planning. The WQMP should not be viewed as a static, all-encompassing statement but rather, a flexible document which provides policy direction and summarizes special studies. As a general foundation, the WQMP contains 10 policy directions ranging from land application of biosolids to wetlands which, in conjunction with the objectives of the WQMP, provide direction on water quality planning and issues. Most of the policies include an implementation procedure as part of the policy and framework discussion.

### **Biosolids And Septage Collection & Disposal**

#### **Issue**

The US Environmental Protection Agency (EPA) has done extensive research on the land application of municipal sewage sludge (biosolids). Studies have shown that biosolids are low in pollutants, high in nutrients and organic matter, and highly suitable for recycling on agricultural and non-agricultural land. Where biosolids have been applied in accordance with regulations, problems that have occurred are rare and are generally related to inadequate field management and not biosolids quality. To be acceptable for agricultural use, sewage sludge must receive treatment to eliminate or greatly reduce pathogens and odors. The final use or disposal of wastewater sludge, or biosolids, is regulated under 40 CFR Part 503 at the Federal level, and the South Carolina Pollution Control Act (§ 48-1-10 et seq., S.C.C.A.), and State regulation R61-9.

#### **Policy**

The use of biosolids and septage in land application should be supported. Well-managed practices such as land application as a soil amendment or fertilizer supplement benefit the land by supplying nutrients to crop lands and disposing of a waste product in a safe manner. Regulation of biosolids disposal for land application or other beneficial uses should continue to be done at the state level by the DHEC. Disposal through landfilling or composting is acceptable as a secondary alternative, where it is economically more acceptable.

## **Elimination of Discharges & Consolidation of Facilities**

### **Issue**

Consolidation of wastewater treatment and/or discharge facilities is encouraged by the State and Section 208 of the CWA, where appropriate. There are dozens of small, privately owned WWTFs that utilize a lagoon or a wastewater pond. The WQMP may identify opportunities for facility consolidation. Generally, publicly owned larger treatment facilities can provide service more effectively while providing a higher degree of treatment than can be achieved through smaller facilities. Further, the consolidation of facilities may help to eliminate smaller facilities which may not be financially capable of operating properly or may be in violation of their discharge permits.

### **Policy**

Small, public or private domestic wastewater treatment facilities are considered temporary facilities. When a regional wastewater collection system, public or private, becomes available, these facilities will be required to connect to that system.

## **Location, Sizing, Staging, And Level of Treatment**

### **Issue**

In determining wastewater needs, the primary goal is to provide reasonable, feasible and economical wastewater service to any particular area. Consideration is given to the impact the treatment system will have on receiving waters, the ability to meet water quality standards and the impact a discharger may have on downstream dischargers. The need for a treatment system is based on growth and development which has been approved by local governments and is consistent with CMCOG's adopted regional water quality management plan goals.

### **Policy**

Location - Any proposed new or expanded facilities are to be reviewed for conformance with the Plan, such that:

1. the proposed location will have no adverse effects on water quality, public health, welfare or safety;

2. the proposed facility is developed considering any local long-range comprehensive land development plan or water resources plan;

3. the proposed treatment works be so located that it is not unnecessarily endangered by natural hazards; and

4. the objectives of other water quality regulations will not be adversely affected.

Sizing and Staging - Ensure that the proposed facility minimizes the potential adverse impact on water quality and promotes the consolidation of treatment facilities whenever feasible, such that:

1. the existing treatment works are not overloaded when connecting new lift stations or interceptors;

2. the proposed treatment works are planned and constructed in a timely manner as needed;

3. the proposed treatment works are developed considering the long range land development for the area;

4. the proposed treatment works or interceptor protects water supplies;

5. the proposed treatment works will have adequately operational management, including legal authority and financial capabilities; and

6. that the objectives of other water quality regulations will not be adversely affected.

7. that temporary or interim facilities are considered acceptable alternatives for collection, transportation or treatment, provided the alternative specifies a long-term permanent plan with the appropriate timing and staging of facilities.

Level of Treatment - Identify threatened and impaired stream segments, and conduct special studies or wasteload allocations, to determine proper wastewater effluent limitations, such that:

1. wasteload allocations may be a limiting factor to treatment facility design; and
2. effluent quality and level of treatment at wastewater treatment facilities will be based on water quality standards as adopted by SCDHEC.

## **Population Forecasts**

### **Issue**

A basic foundation of water quality planning is the forecast of expected wastewater treatment needs, which is tied to future population, housing and employment levels. Forecasts help define wastewater flow rates and the capacity needed to treat the projected volume of wastewater. They can be used to indicate when facility expansion or capital improvements may be needed in the future. They are not intended to be used as limits to capacity.

### **Policy**

Population forecasts in the WQMP shall be consistent with the Central Midlands planning area forecast developed for other regional planning programs. Population, housing and employment forecasts for the Central Midlands planning area will be utilized as guidelines for water quality planning activities. These forecasts will be evaluated every five years as required for transportation, economic development, community development and water quality planning purposes. The sum of population, housing and employment forecasts for individual wastewater service areas should not significantly differ from the regional forecasts.

In the preparation of subarea studies, it is appropriate to evaluate the effects of different growth assumptions. However, the CMCOG encourages the use of its subarea distributions as one of the alternative forecasts considered.



## **Septic Tanks And Other Individual Disposal Systems**

### **Issue**

In South Carolina, poorly designed and located individual systems can contribute significantly to non-point source and groundwater pollution in many areas. Higher density urban or suburban residential areas necessitate the use of public wastewater collection systems rather than septic tanks or small private treatment facilities (See Elimination of Discharges & Consolidation of Facilities).

### **Policy**

CMCOG accepts the use of septic and other individual disposal systems as a means of waste disposal provided they are properly designed and maintained. Individual septic systems may be allowed in rural, low density (< 2.5 Dwelling Units per Acre (DUA)) areas when a public collection system may not be cost-effective. Urban or suburban areas with higher density residential developments (>2.5 DUA) should not utilize individual septic systems. When available and where cost-effective, existing individual disposal systems and new, urban or suburban developments should be required to connect to a public wastewater collection system. These connections improve the efficiency of the public system, and minimize the risks of surface and groundwater contamination resulting from septic and individual system failures. Local governments should identify concentrations of individual septic systems and target those areas for public sewer system extensions.

## **Stormwater Management**

### **General**

Managing stormwater is both fiscally and politically sound when approached as a preventive strategy. Contaminants found in stormwater are often a major contributor to poor water quality. Controlling the quantity and quality of stormwater helps to improve groundwater recharge, reduce sedimentation, and enhances overall water quality. All land disturbing activities that will disturb greater than two (2) acres require a NPDES stormwater management permit prior to construction. Further, all stormwater management plans must be in compliance with state regulations and attached with the permit application. In the State, SC DHEC administers this program.

## **Issue**

Generally speaking, land development can have significant impacts to local and regional ecosystems, which can hinder further development. Clearing land can lead to increased soil erosion, sedimentation or water bodies where best management practices for controlling stormwater runoff are not implemented. Impacts to water resources include eutrophication resulting from increased nutrient runoff, and habitat loss, as well as, the loss of designated uses.

## **Policy**

The WQMP supports the use of Best Management Practices (BMPs) for new development activities. Any new development which disturbs the land should incorporate BMP's. These practices are designed to mitigate potential water pollution impacts such as sedimentation, excess nutrients or pathogens, and aquatic habitat losses resulting from stormwater runoff. BMP's can include retention of vegetation, artificial barriers such as hay bales, the use of drainage channels along roads to reduce erosion, site stabilization using hydro-seeding, and livestock manure management. Developers should refer to the DHEC publication South Carolina Stormwater Management and Sediment Control Handbook For Land Disturbance Activities (1995).

**Table 9: Stormwater Management Objectives**

| Objectives of Controlling Stormwater Runoff |   |
|---|---|
| P   | To prevent the degradation of property by enhancing the environmental character and quality of streams.                               |
| P   | To prevent damages to life and property from flooding resulting from excessive rates and velocities of runoff.                        |
| P   | To reduce public expenditures for replacement or repair of public facilities resulting from artificially induced flood peaks.         |
| P   | To enhance the quality of non-point source runoff by water retention measures.  |
| P   | To prevent degradation of stream quality due to impairment of the stream's biological system.   |
| P   | To prevent degradation of the stream caused by excessive flushing and sedimentation.  |
| P   | To maintain natural stream channels and prevent accelerated bank erosion by controlling the rate and velocity of runoff into streams. |

## Non-Point Source Pollution

### Issue

Non-point source pollution (NPS) refers to runoff from ill-defined, diffuse sources from agricultural, urban, forested and other land uses. Nonpoint source pollution includes fertilizers, pesticides, sediment and contaminants such as street litter and automobile emissions carried by urban runoff. Impacts to water quality resulting from NPS include increased treatment costs, noxious odors and objectionable tastes, and the introduction of disease-bearing organisms to surface waters.

Non-point source pollution has caused problems in the Saluda River ranging from threats to trout habitat to aesthetic problems with turbidity. Most of the sediment problems of the Saluda come from its tributaries, particularly Rawls Creek, a watershed where much development is occurring. Some NPS pollution occurs where vegetated buffer strips along streams, rivers, and lakes are too narrow. Vegetation promotes the uptake of excess nutrients and runoff.

## Policy

CMCOG supports efforts of local governments in the Central Midlands planning area to seek the financial and technical assistance necessary to create, maintain, and enforce comprehensive programs for sediment, erosion, and stormwater runoff. Moreover, CMCOG encourages local governments to use BMPs, which may include vegetated buffers or greater setbacks along water bodies in order to control erosion, sedimentation, and other water quality problems associated with runoff.

## TMDL Allocation

### Issue

TMDL, or "Total Maximum Daily Load" is a phrase from the Clean Water Act which serves to characterize the total acceptable amount of pollutants in mass which a body of water can assimilate under specified conditions without violating water quality standards or objectives. TMDL's are useful in determining the wasteload allocation (WLA) from point source wastewater discharges and may also be used to quantify non-point source load allocations. Conceptually, TMDL's should be developed for all waterbodies, however, the CWA requires TMDL's only for those waters which are not in compliance with water quality standards. In South Carolina, DHEC determines the TMDL's using mathematical water quality models and actual or assumed data.

### Policy

The Plan, *generally but not exclusively*, recognizes a "market demand" allocation approach (that is no limitations on use where capacity is available) for assimilative capacity issues; however, consideration will be given to the following guidelines when evaluating TMDLs:

1. allocations should include sufficient capacity to allow for the continued population and economic growth of the Region,
2. costs of implementing allocation strategies should be fair to the affected discharges. Costs of increasing treatment levels, the proportion of problem causing pollutants originating from any one discharge, and the history of compliance of dischargers with permit conditions will be weighed,

3. allocation capacity to new, or expanded, discharges may not be given, if alternatives to the discharge are reasonable available, or if the discharger has a poor history of compliance with permit conditions.

## **Water Reuse**

### **Issue**

Reuse is an efficient means of preserving water resources in areas where those resources need to be protected. The quantity and quality of wastewater for reuse should be determined during the planning process.

### **Policy**

The WQMP supports the concept of wastewater reuse for irrigation, as a method for additional removal of pollutants, or as a means for reducing the number and volumes of discharges into surface waters. Since every municipality has different circumstances, water reuse programs should be constructed and implemented at the local level.

## **Water Supply**

### **General**

Water quality planning is important in order to have a water supply that is free from disease-producing organisms and other physiologically undesirable substances. The general aim of water quality planning is to protect the resource for a variety of uses including drinking water, recreation, aesthetics, wildlife habitat, and propagation of aquatic species. Consequently, public and private entities in the Central Midlands planning area should consider these issues when proposing projects that may affect water quality within the CMCOG planning region.

### **1. Interbasin Transfer of Water**

#### **Issue**

In South Carolina, the transfer of water from one river basin to another is prohibited by law. The Interbasin Transfer Act of 1985 (§ 49-21-10 et seq. S.C.C.A.) states that "no person shall withdraw, divert, pump, or cause directly the transfer of



either five percent of the seven-day, ten-year low flow, or one million gallons or more of water a day on any day, whichever is less, from one river basin and use or discharge all or any part of the water in a different river basin unless the person shall first obtain a permit from the SC Department of Health and Environmental Control (DHEC).

### **Policy**

The SC DHEC, using the Interbasin Transfer Act, protects the water quality of the state by regulating natural stream flows that , if altered, could impair a stream's natural assimilative capacity. POTWs should comply with the requirements of this law.

## **2. Urban Lakes**

### **Issue**

Artificial impoundment construction can lead to positive or negative impacts on natural resources. Impoundments can provide important habitat to a wide variety of aquatic, terrestrial, and avian species. Threatened or endangered species are often associated with impoundments. The utilization of impoundments by waterfowl and wading birds is well documented.

It is equally well known, however, that impoundments can negatively impact natural systems by altering important natural functions and prohibiting or limiting movement of aquatic organisms, energy, and nutrients. Development adjacent to impoundments can be detrimental to wildlife and fishery resources and is often injurious to natural communities. Altering the natural flow of water can lead to eutrophication - a process by which a standing body of water becomes enriched with excess plant nutrients such as phosphorus and nitrogen, which results in excess algal production. This condition leads to lower dissolved oxygen (DO) levels, critical to fish species. Impoundments also lead to higher water temperatures, greater evaporation losses from the larger surface area, and excess sedimentation. Sedimentation decreases the oxygen supply to fish eggs and blocks fish gill filaments resulting in death (1).

### **Policy**

Impoundment projects may produce public benefits which do not benefit natural resources. Artificial lakes in the Central Midlands planning area should be planned carefully with a view towards ecological consequences. The WQMP supports local government programs requiring long term strategies from urban lake developers

for maintaining water quality. Strategies may include special ordinances or development criteria designed to prevent polluted runoff from washing directly into artificially created urban lakes. Examples are limiting the proportion of the site covered by impervious surfaces; buffer strips; use of greater setbacks for principle residential dwellings and associated buildings; use of aeration devices to maintain a healthy level of DO.

### **3. Groundwater Impacts - Wellhead Protection**

#### **Issue**

In South Carolina, groundwater is the source of drinking water for more than 60 percent of the State's population. This resource is also used by agricultural, industrial, and commercial interests. Due to this widespread use, groundwater contamination could have serious impacts to the state and its residents.

Groundwater contamination sites have been inventoried since 1980 by DHEC. Figure 2 on the following page depicts recent occurrences. It is important to note that while there has been a large increase in the number of sites, it is generally due to financial incentives from the state for remedial efforts that have prompted greater reporting of past problems rather than the discovery of new contamination in the state. The 1994 inventory listed 268 groundwater contamination sites in the Central Midlands Region.

#### **Policy**

The groundwater protection policy for the State of South Carolina is founded on the belief that there is a direct connection between land use and groundwater quality, and that development of the human environment will impact groundwater, regardless of the regulatory safeguards employed. Because it is much less expensive to protect a pristine groundwater source than to restore a contaminated source, a logical goal of state and local governments' groundwater protection strategy should be to protect the present and future uses of the resource.

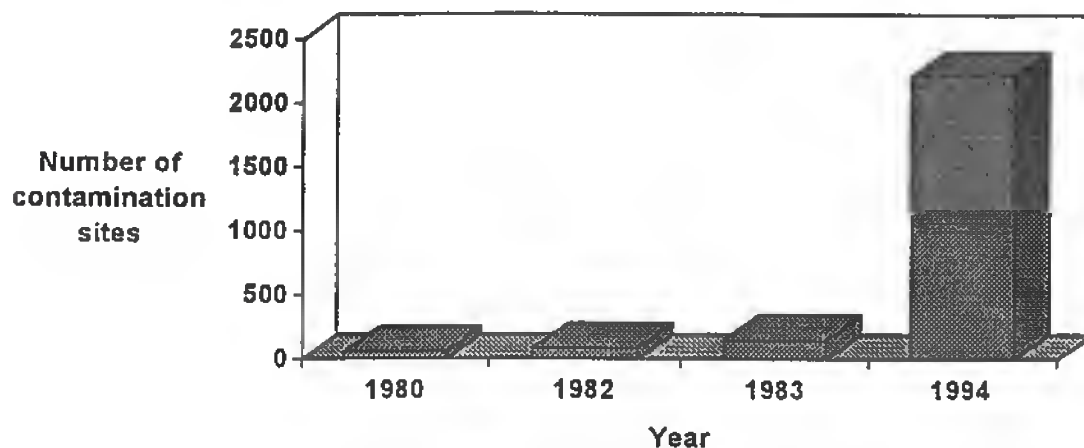
Hence, the WQMP supports the same pro-active approach to groundwater protection. CMCOG will encourage local planning commissions to strive to make the general public more aware of the origins of drinking water supplies, development activities which can impact those resources, and methods to better protect groundwater resources.

Furthermore, areas which are dependent upon groundwater as the main source of drinking water should consider adopting a comprehensive wellhead management strategy, including a Wellhead Protection Area Management Plan. The wellhead protection area (WHPA) refers to the area that will be managed by a community in order to protect groundwater resources.



This area includes "...the surface and subsurface area surrounding a water well or wellfield, supplying a public water system, through which contaminants are reasonably likely to move toward and reach such water well or wellfield" (13).

**Figure 2: Groundwater Contamination Sites in South Carolina, 1980-1994.**



Source: SC Department of Health and Environmental Control, Groundwater Protection Division, 1994.

There are various measures, both regulatory and non-regulatory, that can be used to control activities in areas where wellheads occur. They include zoning ordinances, site plan reviews, design standards, source prohibitions, acquisition of property, education programs, and groundwater monitoring. The wellhead protection area (WHPA) can be delineated using several criteria and methods. The methods by which the area is defined may differ from one community to another.

## **Wetlands**

### **Issue**

Wetlands are areas that are periodically or permanently inundated by surface or ground water and support vegetation adapted for life in saturated soil. Wetlands serve important functions relating to fish and wildlife; food chain production; habitat, nesting, spawning, rearing and resting sites for aquatic and land species; storage areas for storm and flood waters; natural recharge areas where ground and surface waters are interconnected; and natural water filtration and purification functions. The US Army Corps of Engineers and SCDHEC have the authority to regulate wetland alterations under Sections 401 & 404 of the Clean Water Act.

## **Policy**

CMCOG recognizes the ecological and societal values which make wetlands an important natural resource and supports the concept of wetlands protection. All CMCOG plans will distinguish the value of wetlands as part of the planning process and it will encourage local governments to adopt wetlands preservation as part of its zoning and land development regulations. Furthermore, CMCOG promotes the use of wetlands for water quality enhancement activities. The use of artificial and constructed wetlands for resource management purposes, such as wastewater treatment, stormwater abatement, and wildlife management is encouraged. Although the destruction of wetlands is prohibited by law, local governments should call to the attention of developers the potential existence of wetlands in any land development and that damage to wetlands threatens public safety and the general welfare. It is necessary for local governments to ensure maximum protection for nontidal wetlands and those activities in nontidal wetlands and adjacent upland sites that may adversely affect nontidal wetlands and to encourage restoration of already degraded or destroyed wetlands systems.

## **Management Agencies**

### **Issue**

The foundation for the management agency approach lies with the basin or service area strategy for resolving water quality problems. Following the State's watershed water quality management strategy, the 208 Water Quality Management Plan recognizes that most water quality problems are often not confined to one management agency but "spillover" into others which require multijurisdictional solutions. Generally, these problems are complex and interrelated, forcing mutual cooperation and coordination from all parties affected. It is the role of the 208 WQM Plan and CMCOG to promote that cooperation and coordination.

### **General Responsibility**

Each management agency is to be responsible for implementing the Plan policies within its management area. Additionally, the following also applies to management agencies:

## **Policy**

### **1. Designation and De-designation**

Designation - Only municipalities, counties or special purpose districts are eligible for designation as a 208 management agency. All requests for new management agency applicants must: 1) satisfy the threshold requirements listed under Eligibility and Authority, 2) obtain approval of a 208 plan amendment and 3) receive a favorable recommendation from the Governor.

De-designation - A management agency may be de-designated under one of the following conditions: 1) no longer satisfies the threshold requirements listed under Eligibility and Authority, or 2) requests de-designation. De-designation of a management agency would require a plan amendment before forwarding to DHEC and the Governor. Any management areas de-designated will be redesignated as part of the 208 plan amendment. A petition for de-designation of a management agency for failure to meet the eligibility requirements may be initiated by any member government of CMCOG.

### **2. Provision of Service**

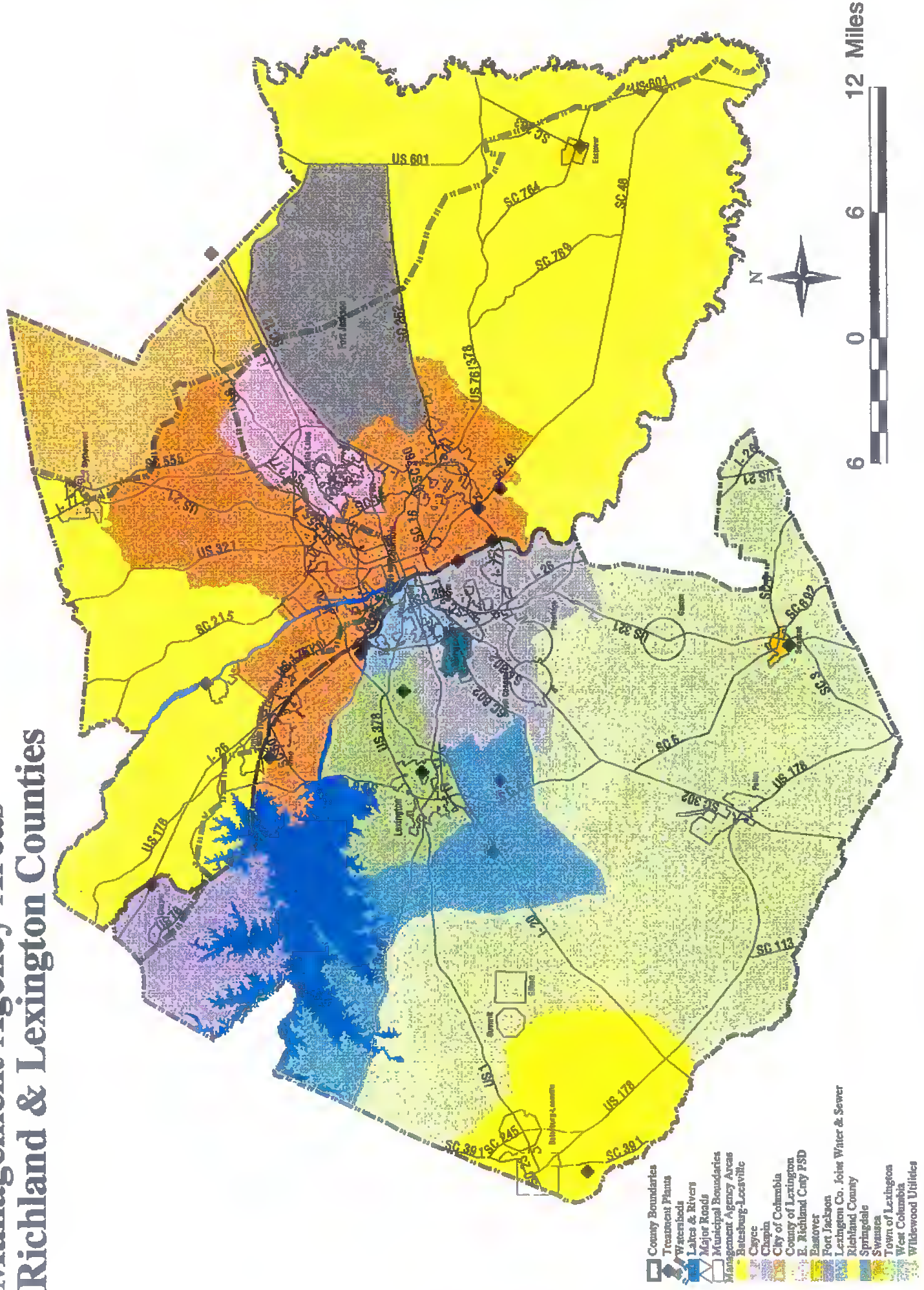
Areas of No Service - In areas where no existing wastewater service exists, the designated management agency is to determine an appropriate service delivery system among cost-effective alternatives which is in conformance with the policies of the WQMP.

Areas of Private Service - The Plan recognizes existing private wastewater systems as providers but encourages their eventual integration into larger more efficient public systems. In general, expansion of private systems are discouraged, unless no cost-effective alternative method for service is available. All private service area expansions require a plan amendment.

Municipal Annexation - Where a municipality annexes lands into another designated management agency's area, the municipality has the right to provide service to that area, provided no existing service is reasonably available and is shown to be the cost-effective means of providing service.

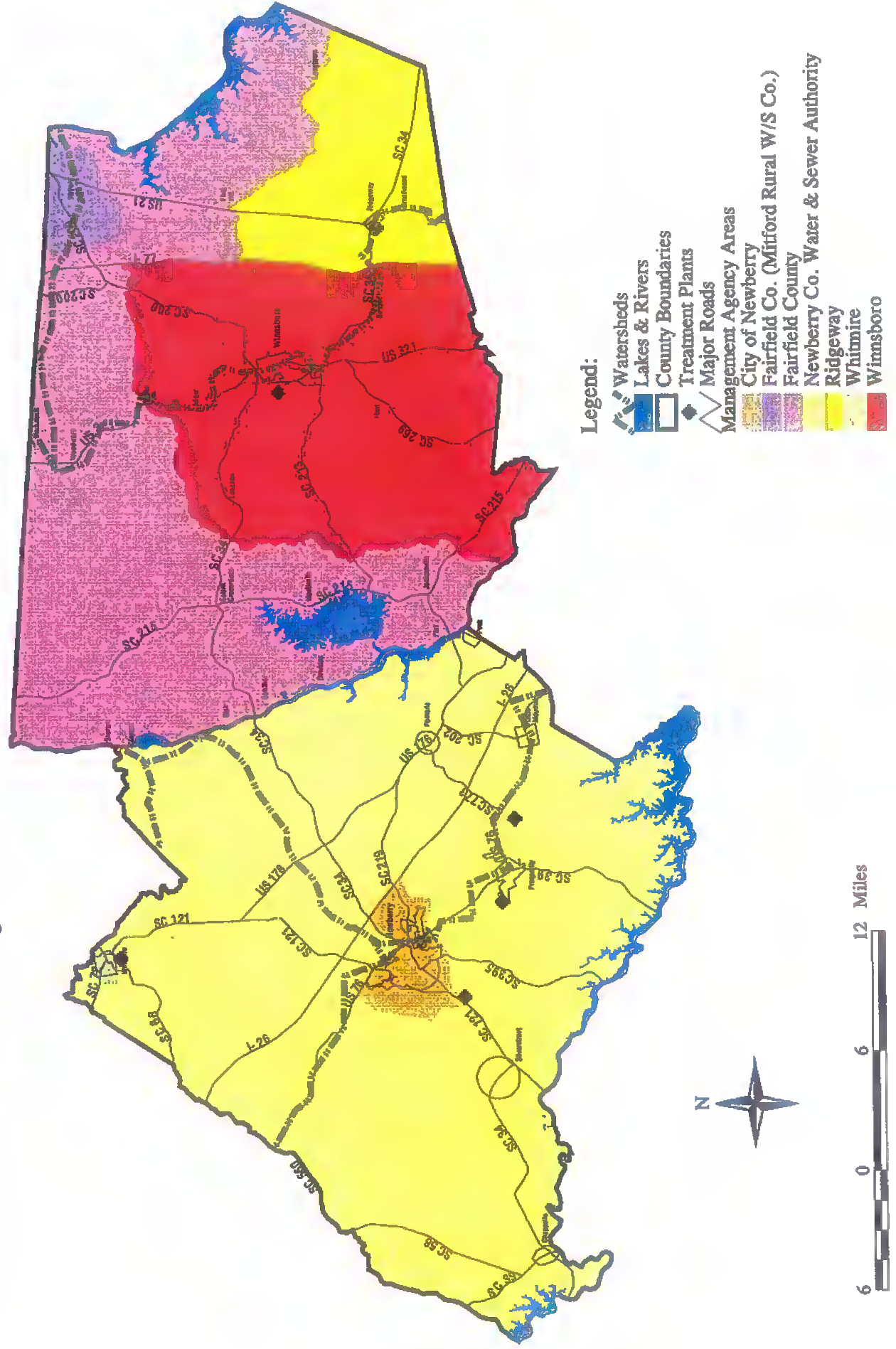


Figure 3  
**Management Agency Areas  
 Richland & Lexington Counties**





**Figure 4**  
**Management Agency Areas**  
**Fairfield & Newberry Counties**







## VI. RIVER BASIN ASSESSMENT AND MANAGEMENT STRATEGY

Taken from the State's *Watershed Water Quality Management Strategy in South Carolina, Program Description*, the basis for approaching water quality planning by watershed for the State is restated in the following:

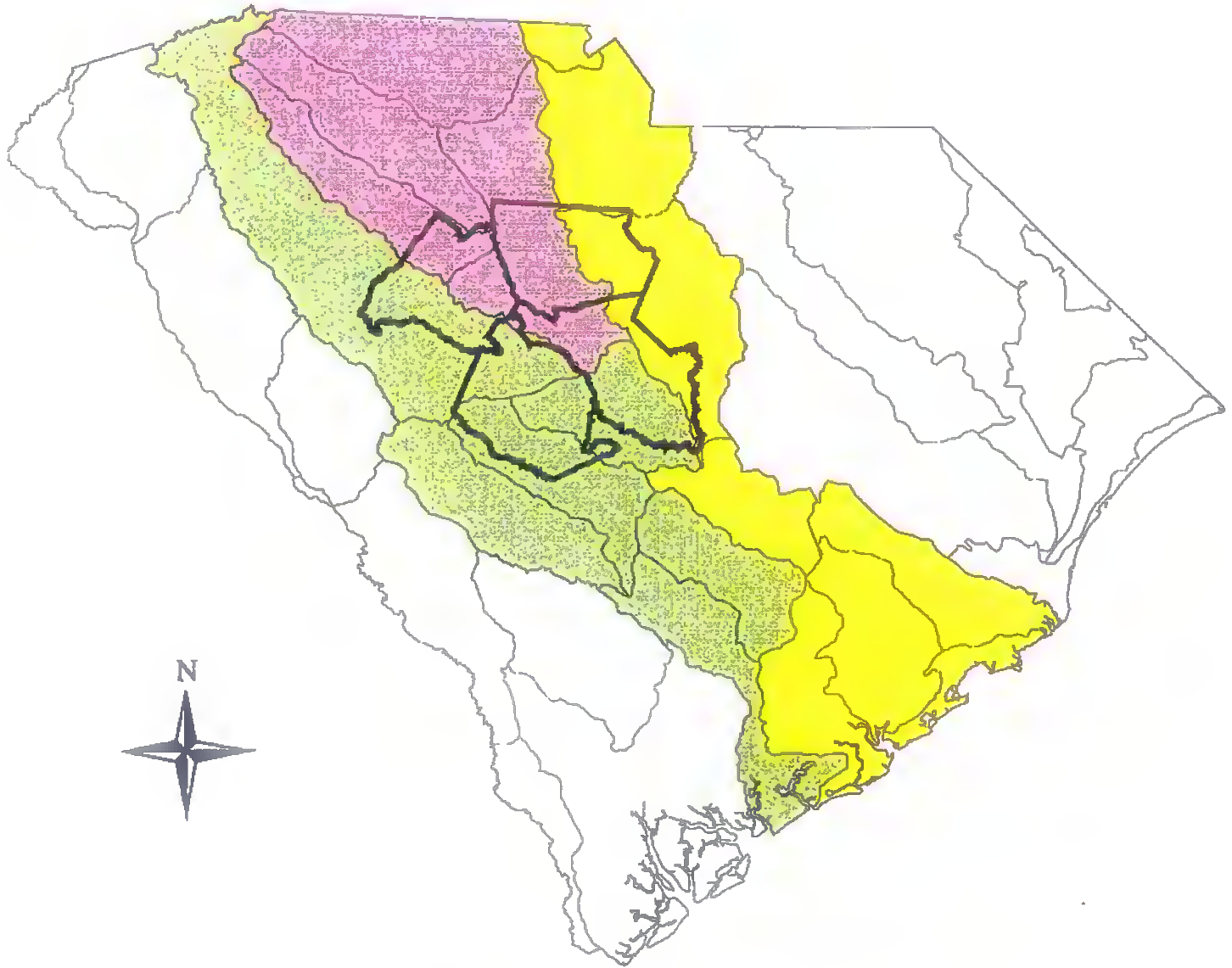
*"Over the past ten years to fifteen years, special water quality initiatives as well as congressional mandates have diverted attention and resources away from comprehensive water quality assessment and protection. In fact, it has been almost twenty years since SCDHEC has undertaken comprehensive water quality planning and water quality protection implementation on a watershed basis. In order to reemphasize a coordinated approach to river basin development and water quality maintenance or improvement; to better address congressional and legislative mandates; to better utilize current resources; and to better inform the public and regulated community of existing and future water quality issues, the Bureau of Water Pollution Control is initiating water quality assessment and protection on a watershed basis. Watershed water quality management recognizes the interdependence of water quality and all the activities that occur in the associated drainage basin: including monitoring, assessment, problem identification and prioritization, water quality modeling, planning, permitting, and other activities. In the Bureau of Water Pollution Control's Watershed Water Quality Management Strategy, these activities will be integrated by basin to watershed management plans and implementation strategies and serve to appropriately refocus water quality protection efforts.*

From this broad State directed approach, the 208 Water Quality Management Plan will address policy and management issues by basin. Of the States five watershed's, the planning boundaries for the Central Midlands region lies within three - Broad, Catawba-Santee and Saluda-Edisto. To date, the SCDHEC has completed their assessment of the Catawba-Santee and Saluda-Edisto. The Broad River basin assessment is expected to be completed in 1998.

Page left blank.

Figure 5

## Central Midlands Region Watersheds



Legend:

 South Carolina Watersheds  
 Central Midlands Region

 Broad River Watershed  
 Catawba-Santee Watershed  
 Saluda-Edisto Watershed

40 0 40 80 Miles





## Broad River Basin Assessment and Management

### Existing Basin Inventory

#### Water Resources

##### General

The Broad River Basin dominates the central Piedmont section of South Carolina. Sharing a long northern border with North Carolina, the basin tapers in a southeasterly direction and terminates at the confluence with the Saluda River near Columbia. The basin covers some 11 counties including the eastern portion of Newberry County, western portion of Fairfield County, the northern portion of Richland County and the extreme northeastern portion of Lexington County. The basin covers approximately 3,800 square miles and is identified as part of Watershed Management Units 501 & 502. Table 10 lists the related watersheds.

Table 10: River Basin & Watersheds

| Basin Name | Sub-Basin    | Watershed Name              | Counties                       |
|------------|--------------|-----------------------------|--------------------------------|
| Broad      | Broad        | Broad River & Tributaries   | Fairfield                      |
|            |              | Sandy Run & Tributaries     | Fairfield                      |
|            |              | Broad River & Tributaries   | Newberry & Fairfield           |
|            |              | Crane Creek                 | Newberry, Fairfield & Richland |
|            |              | Little River                | Fairfield & Richland           |
|            |              | Jackson Creek & Tributaries | Fairfield                      |
|            | Tyger Enoree | Cedar Creek & Tributaries   | Fairfield & Richland           |
|            |              | Tyger River & Tributaries   | Newberry                       |
|            |              | Enoree River                | Newberry                       |
|            |              | S. Fork and Duncan Crks     | Newberry                       |
|            |              | Lower Enoree                | Newberry                       |

##### Fairfield County

The Broad River Basin occupies the western half of Fairfield County and lies entirely in the Piedmont Plateau. This basin, comprised of the Broad River and its

tributaries such as the Cedar Creek and the Little River, can provide a reliable surface water supply throughout the year using presently available storage facilities. On the Broad River, near Richtex in the southern region of the county, the average annual stream flow is 6,250 cubic feet per second (cfs). However, it may range from 149 cfs to 228,000 cfs. Lake Monticello, or the Monticello Reservoir on Frees Creek, has a surface area of 6,800 acres and is used for power, cooling water, recreation, and water supply. Water quality in the Fairfield County portion of the Broad River basin is generally good and does not impair current water uses.

Groundwater in the Piedmont Province of Fairfield County is found mainly in "fractures formed by fault and joint systems and in the saprolite layer" of the soil (S.C. Water Resources Commission, 1983). Saprolite collects and stores rain and runoff for the recharge of groundwater supply to fractures in the underlying rock. Most of the area in the Broad River basin is underlain by the Carolina Slate Belt which contains mostly argillite. Generally, groundwater use is limited to domestic activities as less than one-third of the average rainfall is available to recharge the supply. Wells may yield from 1 to 600 gallons per minute (gpm) and water quality is generally good. However, one well was found which exceeded acceptable water standards with radioactive isotope concentration. This well was disconnected from the public water supply network (S.C. Water Resources Commission, 1983).

### **Newberry County**

The Broad River Basin occupies the eastern half of Newberry County and also lies entirely in the Piedmont Province. This basin, comprised of the Broad River and its tributaries such as Enoree River and Indian and Cannons Creek can provide a reliable surface water supply throughout the year only with adequate storage capabilities as Newberry is in the lower part of the basin. Average annual stream flow along the Broad River in Newberry ranges from 4,090 cfs to 6,250 cfs. The Enoree, located near Whitmire on the northern border of the county, has an average annual stream flow of 433 cfs. However, it may range from 108 cfs to 19,700 cfs. Parr Reservoir which was built on the Broad River in 1914, has a surface area of 4,400 acres and is used for the production of hydroelectric power and recreation. Water quality in the Newberry County portion of the Broad River Basin is generally good. Occasionally dissolved oxygen, fecal coliform bacteria, turbidity, and metals standards are compromised due to municipal and industrial point source discharges and non-point source runoff from urban areas (S.C. Water Resources Commission, 1983).

Groundwater in the Piedmont Province of Newberry County is found mainly in "fractures formed by fault and joint systems and in the saprolite layer" of the soil (S.C. Water Resources Commission, 1983). Saprolite collects and stores rain and runoff for the recharge of groundwater supply to fractures in the underlying rock. Most of the area in the Broad River Sub-basin is underlain by the Carolina Slate Belt which

contains mostly argillite. Generally, groundwater use is limited to domestic activities as less than one-third of the average rainfall is available to recharge the supply. Wells may yield from 10 to 150 gpm and water quality is generally good. (S.C. Water Resources Commission, 1983).

Recent data show that 34.5 percent of Newberry is wetlands of a high marsh, deciduous forest, coniferous forest, or bottomland hardwood nature. Low-lying areas around creeks and rivers have high potential for wetland propagation. Approximately 25 percent of all wetlands are located in the Pacolet-Madison-Cecil soils, which are mostly in the Broad River Sub-basin. Approximately 22 percent of the wetlands, mostly bottomland hardwoods, are in the Pacolet-Cecil-Enon soils that range throughout the western half of the county. Lastly, the Cecil-Hiawassee-Cataula soils have 21 percent of the wetlands, most of which are also bottomland hardwoods.

### **Richland County**

The Broad River basin, found in northwest Richland County, covers most of the Piedmont Province and parts of the upper Coastal Plain. This basin, comprised of the Broad River and its tributaries such as Cedar and Crane Creeks, can provide a reliable surface water supply throughout the year only with adequate storage capabilities. Cedar Creek, near Blythewood, has an average flow of 50.5 cfs, but ranges from 0.66 cfs to 4,870 cfs depending on the amount of rainfall and runoff. Water quality in the Richland County portion of the Broad River basin is poor. This is partly caused by influents from Crane Creek which contain municipal wastewater discharge and urban runoff (Department of Health, Environment and Control, 1975). Crane Creek waters have elevated biochemical oxygen demand, fecal coliform bacteria, metal, phosphorus, and low dissolved oxygen content.

Groundwater in the Piedmont Province of Richland County is found mainly in "fractures formed by fault and joint systems and in the saprolite layer" of the soil (S.C. Water Resources Commission, 1983). Saprolite collects and stores rain and runoff for the recharge of groundwater supply to fractures in the underlying rock. Most of the area in the Broad River Sub-basin is underlain by the Carolina Slate Belt which contains mostly argillite. A 50 foot layer of the Middendorf Aquifer System lies over the slate belt in the extreme southeastern corner of the sub-basin. Around the towns of Blythewood, Killian, and Ballentine, most wells yield from 2 to 50 gpm and are used primarily for domestic activities. The water quality of these wells is generally good.

The Piedmont Plateau, or northwestern region, holds the highest percentage of Richland County's coniferous forested wetlands and bottomland hardwoods, 15.1 and 27.0 percent, respectively. These soils are the Tatum-Georgeville-Herndon soil association. Close to this region, in the upper Coastal Plain of the sub-basin, the Herndon-Helena-Georgeville soils hold 11.4 percent of the coniferous wetlands and 21.1 percent of the bottomland hardwoods. The Broad River basin contains 31.4 percent of all the wetlands of the county.



## **Lexington County**

The southern fringes of the Broad River basin edge along the Lexington-Richland County border near Chapin. Streams that originate in this area exhibit low flows. Only 0.2 percent of Lexington's population is within this basin and water supply from it is close to zero.

### **Treatment Facilities**

This information will be provided upon completion of the *Broad River Basin Watershed Water Quality Management Strategy*.

### **Treatment and System Capacity**

#### **Newberry County**

While there are a number of small industrial and community systems in the basin, there are three public providers of sewer service. The City of Newberry has the largest system with a highly developed network capable of meeting large treatment needs. Its plant has a current capacity of 3.2 MGD with flows averaging 2.10 MGD per day. The City is undertaking an upgrade and expansion to 4.8 MGD over the next ten years. Industrial and non-industrial flows are about equal.

The second provider, The Newberry County Water & Sewer Authority, operates three plants: Dewalt plant which serves the Town of Prosperity; Plant #2 at Camping Creek which is east of the Town of Prosperity and a small community plant at Bedford Way Subdivision. The Dewalt plant is rated at 0.651 MGD and has a average flow of 0.3 MGD. No plans are made to expand this facility. Camping Creek is rated at 0.03 MGD and is cited for eventual elimination. Bedford Way is also rated at 0.03 is expected to remain in service with no plans for expansion.

The third provider is the Town of Whitmire which operates a 0.60 MGD facility. Plans have been proposed to expand the facility to a 0.85 MGD facility.

#### **Lexington County**

The Town of Chapin is the only provider of wastewater service in Lexington County that is also within the basin. The Town has a 1.2 MGD treatment plant with an extensive line network that extends throughout town, toward Lake Murray, and most recently to the I-26 Interchange. No plans for expansion are anticipated.

## **Richland County**

In Richland County there are three major public treatment facilities: the City of Columbia's Metro plant, the East Richland Public Service District (ERPSD) Main plant and the County's Broad River WWTP. The City of Columbia's Metro plant is the region's largest and is rated at 40.0 MGD. The City is currently expanding and upgrading its plant to 60.0 MGD. It accepts additional flows from unincorporated portions of Richland and Lexington Counties and the City of West Columbia.

The ERPSD's Main plant is a 10.0 MGD facility. It is anticipated that an expansion to 14.0 MGD is planned in the next few years given the District's current rate of growth.

The County's Broad River plant is a 2.5 MGD facility that serves the northwest portion of the County. It has a design capacity of 15.0 MGD. Plans for expansion are expected in the near future.

## **Fairfield County**

The Town of Winnsboro's wastewater treatment plan has a permitted capacity of 1.6 MGD and treats 700,000 gallons per day. Of its current flow, 200,000 gpd is industrial and 500,000 gpd is non-industrial. Its distribution system covers the municipal limits and some properties immediately adjacent.

## **Existing Population and Land Use**

The estimated 1990 population of the basin lying within the 208 planning area boundary is approximately 127,565 persons. It is estimated that 73.0% of the population lies in Richland County, 15.0% in Newberry County and 12.0% in Fairfield County.

In eastern Newberry and western Fairfield Counties, the population is thinly spread throughout these rural areas. The eastern edge of Newberry County and portions of western Fairfield County is dominated by the Sumter National Forest with the balance of the area held in scattered, large-lot residential uses. Light commercial activities and several heavy industrial plants can be found throughout and at major highway intersections or just outside the two largest municipalities, the City of Newberry and Town of Winnsboro.

Northwest and northcentral Richland County is by contrast much more developed with higher density residential uses and large concentrations of commercial and industrial activity. The northwest area or "Broad River" corridor is experiencing rapid suburbanization with multiple subdivisions planned or under construction. The trend of commercial development is directly following this residential inflow, particularly as the population base expands. Commercial development and construction is typically

targeting the St. Andrews, Irmo, Harbison, Ballentine areas and along Broad River road.

In the northcentral area or Crane Creek sub-basin, industrial development has increased significantly with the relocation of numerous manufacturing firms from the northeastern portion of the country and foreign interests. Residential development has been modest with some new construction occurring in City of Columbia. Commercial construction has been stable generally tracking the trend in residential development. See Figure 6 for a detailed map of existing land use.

## **Projected Growth**

### **Development Trends and Land Use**

#### **Fairfield County**

Countywide population projections forecast a gradual increase of 11.6% from 1990 to 2015. Most of this growth is expected to occur in the central and eastern portions of the County. Like most predominately rural counties, with scattered residential development uses, commercial uses beyond the Town of Winnsboro are found in singular locations, at intersections and along the more heavily travelled roads. Significant populations shifts are not expected in this portion of the county, suggesting similarly limited changes in the land use pattern. Figure 7 illustrates the projected land use pattern.

#### **Newberry County**

Development in Newberry is expected to be modest. The majority of new commercial and industrial activity is also expected to be located outside of the basin. The limited growth forecasted is based upon the overall lack of adequate utilities to serve the area. While the upper portion of the basin is effectively excluded from development by the Sumter National Forest, new construction activity in the southern portion of the basin will largely be limited to individual residences placed on individual lots. Commercial and industrial activity is not expected to expand significantly but will track residential development and its demand for services and products.

#### **Richland County**

Significant growth and development is expected for this area. Ample available land that is served by water and sewer is forecasted to drive a substantial increase in all three land use categories: residential, commercial and industrial. In the northwest portion, the rate of residential development is anticipated to be sustained, followed by proportionate increases in commercial construction activity. Building on the existing

trend of commercial concentrations in the St. Andrews, Imo and Harbison areas, the northwest will continue to emerge as a regional commercial hub for the area.

Along the I-77 Corridor which includes portions of the Crane Creek sub-basin, prospects for industrial development is also expected to remain strong. Development potential reinforced by an aggressive economic development policy by the City of Columbia and Richland County suggests continued new plant relocations. Areas such as Killian and Blythewood are expected to increase in population and construction activity. In contrast, some areas between Broad River and SC 321 will likely remain undeveloped. This area consist mainly of forestlands and cleared pasture. Most of the land is held by large paper companies with no expectation of conversion to more intensive uses.

### Population and Employment Projections

Table 11 indicates a 22.0% increase in population and 23.0% increase in employment from 1990 to 2010. Most of this increase will be seen in Richland County as part of the intensifying of commercial and industrial development along the I-26 and I-77 Corridors. Newberry and Fairfield Counties, while experiencing change and growth, will be more modest and will largely be limited to increases in employment, particularly industrial development.

Table 11: Population and Employment Projections

| Basin Number | 1990 Population | 1990 Dwellings | 1990 Emp.     | 2015 Population | 2015 Dwellings | 2015 Emp.     |
|--------------|-----------------|----------------|---------------|-----------------|----------------|---------------|
| 3050106-010  | 35              | 12             | 0             | 39              | 12             | 15            |
| 3050106-040  | 40              | 14             | 0             | 44              | 14             | 0             |
| 3050106-050  | 6,047           | 2,190          | 3,350         | 6,806           | 2,247          | 5,562         |
| 3050106-060  | 101,728         | 39,239         | 57,506        | 126,520         | 61,002         | 68,431        |
| 3050106-070  | 1,635           | 569            | 510           | 1,850           | 610            | 750           |
| 3050106-080  | 9,695           | 3,343          | 4,357         | 10,827          | 3,447          | 6,000         |
| 3050106-090  | 2,492           | 940            | 531           | 3,123           | 1,296          | 696           |
| 3050107-050  | 15              | 5              | 0             | 17              | 6              | 0             |
| 3050108-020  | 460             | 171            | 178           | 520             | 175            | 200           |
| 3050108-043  | 1,715           | 637            | 1,282         | 1,938           | 652            | 1,500         |
| 3050108-050  | 3,703           | 1,376          | 1,039         | 4,183           | 1,407          | 1,444         |
| <b>Total</b> | <b>127,565</b>  | <b>48,496</b>  | <b>68,753</b> | <b>155,867</b>  | <b>70,868</b>  | <b>84,598</b> |

## Needs Assessment and Projected Build-out Capacity

In Table 12, it is estimated that the 1990 wastewater flow generated is approximately 16.5 MGD for the basin. Of the 16.5 MGD estimated flow, current usage suggests an estimated 8.4 MGD is treated through septic tanks.

Projections for 2015 estimate build-out flow of 20.4 MGD. Projections for septic tank treatment are to remain proportionately the same. Projected septic tank treatment is estimated at 10.2 MGD.

Overall demand for treatment is expected to increase by 4.1 MGD, with demand for central sewer treatment to increase 2.1 MGD from 8.1 to 10.2 MGD.

Table 12: Estimated Existing and Projected Flow

| Basin Number | 1990 Flow         | 1990 Dwellings | 1990 Emp.     | 2015 Flow         | 2015 Dwellings | 2015 Emp.     |
|--------------|-------------------|----------------|---------------|-------------------|----------------|---------------|
| 3050106-010  | 3,850             | 12             | 0             | 4,740             | 12             | 15            |
| 3050106-040  | 4,400             | 14             | 0             | 4,840             | 14             | 0             |
| 3050106-050  | 785,920           | 2,190          | 3,350         | 960,020           | 2,247          | 5,562         |
| 3050106-060  | 13,317,770        | 39,239         | 57,506        | 16,586,010        | 61,002         | 68,431        |
| 3050106-070  | 195,950           | 569            | 510           | 227,040           | 610            | 750           |
| 3050106-080  | 1,218,910         | 3,343          | 4,357         | 1,400,990         | 3,447          | 6,000         |
| 3050106-090  | 292,650           | 940            | 531           | 369,290           | 1,296          | 696           |
| 3050107-050  | 1,650             | 5              | 0             | 1,870             | 6              | 0             |
| 3050108-020  | 57,440            | 171            | 178           | 64,800            | 175            | 200           |
| 3050108-043  | 238,350           | 637            | 1,282         | 271,340           | 652            | 1,500         |
| 3050108-050  | 443,500           | 1,376          | 1,039         | 513,270           | 1,407          | 1,444         |
| <b>Total</b> | <b>16,560,290</b> | <b>48,496</b>  | <b>68,753</b> | <b>20,404,210</b> | <b>70,868</b>  | <b>84,598</b> |

## Watershed Assessment: Water Quality Issues and Standards

This information will be provided upon completion of the *Broad River Basin Watershed Water Quality Management Strategy*.



## Management and Policy Issues

### Management Agencies & Service Provision

**General Basin Policy:** There are eight (8) management agencies recommended for plan implementation in the basin. Generally, each management agency and its facilities is set up to be the major provider for each area and act as an general coordinator of wastewater collection, transportation and treatment. And, while other facilities identified in the plan may currently operate independently of a management agency's facilities or their related systems, all facilities within an agency's area may be identified for eventual consolidation and elimination for water quality, public health and cost-effectiveness objectives.

#### A. Management Agency: City of Newberry

**Management Agency Area:** City of Newberry and surrounding area.

**General Policy:** Under sole management agency direction, the City of Newberry is to implement the provisions of the plan for the prescribed management agency area with treatment at its Bush River facility.

| Facility   | Provider         | Basin (s)       | Permitted Capacity         |
|------------|------------------|-----------------|----------------------------|
| Bush River | City of Newberry | 3050109-150 (p) | 3.2 MGD<br>1.6 MGD Planned |

(p) portion of the basin

#### B. Management Agency: Town of Whitmire

**Management Agency Area:** Town of Whitmire and adjacent areas.

**General Policy:** Under sole management agency direction, the Town of Whitmire is to implement the provisions of the plan for the prescribed management area with treatment at its Duncan Creek facility.

| Facility     | Provider         | Basin (s)                  | Permitted Capacity |
|--------------|------------------|----------------------------|--------------------|
| Duncan Creek | Town of Whitmire | 3050108-020<br>3050108-043 | 0.60 MGD           |



**C. Management Agency: Newberry Water & Sewer Authority**

**Management Agency Area:** Unincorporated Newberry County, excluding area immediately adjacent the City of Newberry.

**General Policy:** Under sole management agency direction, the Newberry Water & Sewer Commission is to implement the provisions of the plan for the prescribed management area, and with the long-term objective of consolidation of its facilities into a larger regional plant, separately or inconjunction, with the City of Newberry.

| Facility      | Provider | Basin (s)       | Permitted Capacity |
|---------------|----------|-----------------|--------------------|
| Dewalt        | NCW&SA   | 3050109-150 (p) | .651 MGD           |
| Camping Creek | NCW&SA   | 3050109-190     | .03 MGD            |
| Bedford Way   | NCW&SA   | 3050109-190     | .03 MGD            |

**D. Management Agency: Town of Winnsboro**

**Management Agency Area:** Central Fairfield County

**General Policy:** Under sole management agency direction, the Town of Winnsboro is to implement the provisions of the plan for the prescribed management agency area with treatment at its Jackson Creek facility.

| Facility      | Provider          | Basin (s)       | Permitted Capacity |
|---------------|-------------------|-----------------|--------------------|
| Jackson Creek | Town of Winnsboro | 0305104-010 (p) | 1.6 MGD            |

(p) portion of the basin

**E. Management Agency: Town of Chapin**

**Management Agency Area:** Town of Chapin and Northeast Lexington County

**General Policy:** Under sole management agency direction, the Town of Chapin is to implement the provisions of the plan for the prescribed management area with treatment at its Wateree Creek facility.

| Facility      | Provider       | Basin (s)       | Permitted Capacity |
|---------------|----------------|-----------------|--------------------|
| Wateree Creek | Town of Chapin | 3050109-190 (p) | 1.2 MGD            |

**F. Management Agency: City of Columbia**

**Management Agency Area:** City of Columbia, portions of northwest and south-central Richland County and northeast Lexington County.

**General Policy:** Under sole management agency direction, the City of Columbia is to implement the provisions of the plan for the prescribed management agency area with treatment at the Columbia Metro Plant.

| Facility       | Provider         | Basin (s)  | Permitted Capacity                     |
|----------------|------------------|--|--|
| Columbia Metro | City of Columbia | 3050109-190<br>3050109-210<br>3050110-010<br>3050110-030 | 40.0 MGD<br>20.0 MGD Planned Expansion |

**G. Management Agency: East Richland Public Service District (ERPSD)**

**Management Agency Area:** Portions of Northeast Richland County

**General Policy:** Under sole management agency direction, the ERPSD is to implement the provisions of the plan for the prescribed management agency area such that wastewater flow is transported to the ERPSD Main plant for treatment.

| Facility   | Provider | Basin (s)   | Permitted Capacity |
|------------|----------|-------------|--------------------|
| ERPSD Main | ERPSD    | 3050110-030 | 10.0 MGD           |

**H. Management Agency: Richland County**

**Management Agency Area: Unincorporated Richland County**

**General Policy:** Under sole management agency direction, Richland County is to implement the provisions of the plan for the prescribed management agency area such that the wastewater flow in the northwest portion of the County is transported to the Broad River plant for treatment.

| Facility    | Provider        | Basin (s)   | Permitted Capacity |
|-------------|-----------------|-------------|--------------------|
| Broad River | Richland County | 3050109-090 | 2.5 MGD            |

**Long Range Basin Planning**

While the Regional 208 Water Quality Management Plan will act as the principal guide in directing actions taken by local designated management agencies, the plan also recognizes the impact of other planning efforts. For this reason, the 208 Plan attempts to blend with it related planning activities to better coordinate infrastructure needs and assist member local governments in their efforts to control the effects of growth and development on the environment.

**River Alliance Corridor Plan**

The River Alliance was formed in 1993 in an effort to construct a plan that would maximize the potential of the region's river system, specifically the confluence of the Broad, Congaree and Saluda Rivers. Its planning efforts focus on three major themes:

1. revitalizing the urban core which consists of the developed lands adjacent the rivers in the City of Columbia, W. Columbia, Cayce and unincorporated Richland and Lexington Counties,
2. preserve and protect the natural character of the environment, promoting wilderness protection, buffering controls, cluster development models and natural parklands; and
3. Encourage a corridor approach to land and water related recreation, while linking historical and cultural resources into an integrated system.

In total, the plan itself is comprised of more than 150 policy and project recommendations. It will be the task of the River Alliance to implement these projects and promote the policies among the member local governments. While the development process is its formative stages, the 208 Water Quality Management Plan endorses the efforts of the River Alliance as it relates to the protection of water quality and sensitive environmental use of the regions water resources.

## **Long Range Comprehensive Land Use Planning**

### **Newberry County**

In Newberry County zoning has not been adopted for the unincorporated area which precludes the legal requirement for land use planning. Of the municipalities in the basin, the City of Newberry and the Town of Whitmire have zoning and the required long-range development plans. While both municipalities anticipate growth of the next twenty-five years, only the City of Newberry forecasts the need for additional infrastructure improvement relating to its wastewater system. Specifically, the City in conformance with its land use plan calls for the extension of service immediately adjacent the City which would promote its annexation strategy. Currently, the City is also seeking to improve its wastewater plant by expanding its capacity.

Separate but related, Newberry County has undertaken an pro-active infrastructure planning effort titled the, *I-26 Corridor Utility Study, US 176 to Highway 32, Wilbur Smith & Associates, March 1996*. This study performed at the request of the Central Carolina Economic Development Alliance, examines the costs and feasibility of providing water and sewer service to all interchanges along Interstate 26. The County is currently working with the City of Newberry and the Newberry Water & Sewer Authority to implement its recommendations, in hopes of furthering economic development opportunities.

### **Fairfield County**

Similar to Newberry County, Fairfield County has not implemented zoning, limiting the legal need for a long-range development planning. However, the County Planning in anticipation of infrastructure needs did adopt a land use plan, the *Comprehensive Land Use & Development Plan, Fairfield County, 1992*. In the document, it cited the I-77 corridor as the key development area for industrial and commercial development. Further, the plan forecasted the areas around the Monticello Reservoir and Jenkinsville as growing residential areas which given its proximity to sensitive streams and the reservoir suggests the need for public sewer.

The Town of Winnsboro has adopted zoning and a land development plan. And, while the plan itself does not address the extension of water and sewer lines beyond its

municipal limits, the Town has taken an aggressive economic development strategy to improve its sale of water and sewer. Also, while the Town has focused on the I-77 Corridor as its main economic future, it has extended its lines south and west along Pumphouse Road in anticipation of future needs..

### Richland County

Since 1979, Richland County has had zoning, and subsequently has had several land use plans which address the basin. Two planning subareas cover the basin: the *Northwest Area* and the *Northcentral Area*. Both plans were recently completed as part of the County's revision of its comprehensive plan.

The Northwest Area plan recognizes significant growth in residential uses with the complimentary, yet delayed trend of commercial development over the next twenty-five years. Residential uses of a low to medium density will remain the driving force of change in the area. Commercial development is expected to continue along the major arterial in a dominant fashion, with some industrial uses mixed in at major highway intersections.

In the northcentral area, forestlands are the dominant use and is likely to remain so as most of the land is held by private timber companies. Current demand for developable land is projected to be satisfied in other parts of the county, insuring the northcentral area to be left as a largely rural, pastoral landscape.

Both plans forecast the need for increased wastewater distribution and treatment but recognize the current management agencies, City of Columbia and Richland County, as appropriate to meet the demands for service.

## Catawba-Wateree River Basin Assessment and Management

### Existing Basin Inventory

#### Water Resources

##### General

The Catawba-Wateree River Basin is a sub-basin which lies within the broader Catawba-Santee Basin. The Catawba-Wateree River Basin encompasses 2,381.6 square miles with geographic regions that extended from the Piedmont to the Sandhills and to the Upper Coastal Plain. It includes portions of Fairfield and Richland Counties and is identified as part of the Watershed Management Unit 0301. Table 13 lists the related basin and watershed relationships.

**Table 13: River Basins & Watersheds**

| Basin Name     | Sub-Basin Name | Watershed Name   | Counties   |
|----------------|----------------|--|--|
| Catawba-Santee | Catawba        | Cane Cr. & Trib.<br>Rocky Cr. & Trib.  | Fairfield<br>Fairfield   |
|                | Wateree        | Wateree Lk. & Trib.<br>Big Wateree Cr. & Trib.<br>Wateree R. & Trib.<br>Swaney's Cr. & Trib.<br>Twenty-five Mile Cr. & Trib.<br><br>Spears Cr. & Trib.<br>Colonels Cr. & Trib. | Fairfield<br>Fairfield<br>Richland<br>Fairfield<br>Fairfield<br>& Richland<br>Richland<br>Richland |

##### Fairfield County

The Catawba-Wateree River basin lies in the eastern half of Fairfield County. Only a small portion of the southeastern corner, which has no major tributaries or influences on the sub-basin, lies in the Upper Coastal Plain. In Fairfield County, the Catawba River flows south until it merges with Big Wateree Creek. Here it becomes the Wateree River which flows through Wateree Lake. This river system's main tributaries include Wateree Creek, Dutchmans Creek, and Sawneys Creek.

Above the Wateree Dam, on the main stem of the river, a well sustained flow throughout the year provides a constant water supply. However, below the dam, daily fluctuations and low flows may limit water use activities. Tributaries are not reliable water sources because of low flows during periods of low rainfall. Storage facilities



better ensure surface water availability.

Wateree Lake, which has a surface area of 13,710 acres, is located on the eastern border between Fairfield and Kershaw Counties. This lake is used for power generation, municipal water supply and recreation. Water quality is generally good, however surface waters above the lake are of poorer quality than those below because of greater development around the Mitford area. Wateree Lake is eutrophic, or has heavy nutrient loading, primarily from point source discharges on the Catawba River. Although this has not significantly affected water use, continued nutrient loading could limit some water activities (S.C. Water Resources Commission, 1983).

Groundwater in the Catawba-Wateree basin of Fairfield County is mostly in the Carolina Slate Belt which traverses the Piedmont Province. This supply appears to be limited with many wells yielding only 10 gpm. This groundwater, high in iron and magnesium, generally has good water quality.

Recent data show that 33.9 percent of Fairfield is covered in wetlands of a high marsh, deciduous forest, coniferous forest, or bottomland hardwood nature. Low-lying areas around creeks and rivers have high potential for wetland propagation. Most are bottomland hardwoods which are primarily deciduous hardwood trees occurring in swamps or other partially or occasionally inundated environments. Approximately 29 percent of all wetlands are located in the Wilkes-Winnsboro-Madison-Mecklenburg soils, which are in both the Broad and Catawba-Wateree River basins. Approximately 20 percent of the wetlands, mostly bottomland hardwoods, are in the Pacolet-Cecil-Wilkes-Applying soils that range throughout the county in the southern region. The Georgeville-Herndon-Tatum-Helena soils have 15.8 percent of the wetlands in Fairfield County of which most are also bottomland hardwoods.

### **Richland County**

The Catawba-Wateree River Basin runs along the eastern edge of Richland County, almost entirely in the upper Coastal Plain Province. Before reaching Richland County, the Catawba River flows south, until it merges in with Big Wateree Creek. Here, it becomes the Wateree River which flows through Wateree Lake, continuing south to the Richland/Sumter County border. Below Eastover, the main stem of the Wateree River gives an average annual flow of 7,090 cfs, with only slight variations. The main tributary found in Richland County is Colonels Creek which also gives a well sustained flow of 47 cfs. This is attributed to the location of the Creek in the Upper Coastal Plain sediments. Water quality is generally good (S.C. Water Resources Commission, 1983).

Groundwater in the Catawba-Wateree Basin of Richland County is mostly in the Carolina Slate Belt which traverses the Piedmont Province. This supply appears to be limited with many wells yielding only 10 gpm. However, below the Fall Line, the Middendorf, Black Creek, and Black Mingo Aquifer Systems provide much better sources of groundwater with the upper coastal plain sediments reaching depths up to

650 feet. The Black Mingo is the most shallow aquifer and provides most of the water for domestic and small municipal wells. This groundwater generally has good water quality (S.C. Water Resources Commission, 1983).

Wetlands of the Catawba-Wateree River Basin are concentrated in the Lower Coastal Plain which lies in a north to south band along the Wateree River in the lower most part of the sub-basin. This area contains mostly deciduous forested wetlands with some fresh water non-forested wetlands and some bottomland hardwoods. The entire southeastern border of Richland County, bounded by the Wateree River, has bottomland forest.

### Treatment Facilities

There are 12 dischargers within the basin which are listed in Table 14.

Table 14: Discharges By County

| Facility Name          | NPDES Number | Watershed Management Code | Receiving Stream | Type        | Cnty      |
|------------------------|--------------|---------------------------|------------------|-------------|-----------|
| Richard Winn Academy   | SC0028134    | 03050104-010              | Ready Creek      | Minor Comm. | Fairfield |
| Jones & Frank SCPRT    | SC0042048    | 03050104-010              | Wateree Lake     | Minor Ind.  | Fairfield |
| White Oak Conf. Ctr.   | SC0035980    | 03050104-020              | Big Wateree Ck.  | Minor Ind.  | Fairfield |
| Union Camp             | SC0038121    | 03050104-030              | Wateree River    | Major Ind.  | Richland  |
| Kennecott Mining Co.   | SC0041378    | 03050104-050              | Sawney's Creek   | Minor Ind.  | Fairfield |
| Fairfield Nursing Home | ND0067008    | 03050104-050              | Sprayfield       | Minor Comm  | Fairfield |
| Kennecott Mining Co.   | SC0041378    | 03050104-060              | Bear Creek       | Minor Ind.  | Fairfield |
| Valhalla Co.           | SC0043494    | 03050104-090              | Spears Creek     | Minor Comm  | Richland  |
| Hacienda MHP           | ND0067598    | 03050104-090              | Tile Field       | Minor Comm  | Richland  |
| Homelite/ Textron      | ND0072818    | 03050104-090              | Sprayfield       | Minor Ind.  | Richland  |

Table 14 Continued: Discharges By County

| Facility Name            | NPDES Number | Watershed Management Code | Receiving Stream  | Type       | Cnty     |
|--------------------------|--------------|---------------------------|-------------------|------------|----------|
| SC National Guard Train. | SC0046108    | 03050104-100              | Stormwater Runoff | Minor Ind. | Richland |
| US Marine Corp.          | SC0038792    | 03050104-100              | Leesburg Br.      | Minor Ind. | Richland |

## Treatment and System Capacity

### Fairfield County

It is important to note that while the Towns of Winnsboro, Ridgeway and Great Falls have no wastewater discharge points in the basin, each municipality does have interceptor or collection lines within it. For this purpose, a brief description of the system is provided.

The Town of Winnsboro's wastewater treatment plant has a permitted capacity of 1.6 MGD and treats 700,000 gallons per day. Of its current flow, 200,000 gpd is industrial and 500,000 gpd is non-industrial. Its distribution system covers the municipal limits and lands immediately adjacent.

The Town of Ridgeway's wastewater treatment plant has a permitted capacity of 120,000 gallons per day and treats 70,000 gallons per day. All the flow is non-industrial. Similar to the Town of Winnsboro, the Town of Ridgeway largely confines its system to the town limits.

The Town of Great Falls has extended an eight (8) inch line to the I-77/SC 200 interchange. The line is connected to the Town of Great Falls 1.4 MGD treatment plant by two pump stations.

### Richland County

In unincorporated Richland County Wildewood Utilities is the only major wastewater provider. It is a private utility which was established in 1987 under an agreement with Richland County. The agreement terms permit Wildewood Utilities to offer service in the northeast portion of the county. This service area was granted by the SC Public Service Commission. Currently, the system operates a .75 MGD treatment facility with a permitted capacity for 2.25 MGD. The treated effluent is pumped to a rapid infiltration site for final disposal.

## **Population and Land Use**

The estimated 1990 population of the basin within the 208 planning area is approximately 20,045 persons. It is estimated that 33.2% of the population lies in Fairfield County while 66.8% lies in Richland County.

In Fairfield County, the population is largely concentrated in and around the Town of Winnsboro with the remainder scattered throughout the county. Richland County's population, like Fairfield County, is concentrated in the upper northeastern portion, locally referred to as the Pontiac area. The lower portion of the basin as it follows the Wateree River is sparsely populated given most of it is unsuited for development.

Land use characteristics within the basin vary for each county. As shown in Figure 6, Fairfield County is rural and largely undeveloped, whereas Richland County is an urban county with a rapidly expanding population, particularly in the unincorporated areas.

In Fairfield County, the higher density residential and more intensive commercial uses can be found in and surrounding the Towns of Winnsboro and Ridgeway and along Lake Wateree. Scattered industrial uses are also located in the basin particularly along SC 34. In the remaining portion of the county the land use is characterized by scattered housing and isolated commercial or industrial uses (Kennecott Mining Company), separated by large tracts of forest land or open space.

For Richland County, the land use pattern is different. Contrastingly, the northeast portion of the county is largely made up of high density residential with a significant commercial and industrial presence. Non-residential development dominates the frontage of most of the arterial road network with high density residential locating between the arterials. While this pattern is consistent throughout the Pontiac area, the development pattern becomes less intense with more undeveloped lands near the Town of Blythewood and to the Fairfield County line.

The lower Richland portion remains undeveloped and mostly preserved in its natural state, consisting of marsh, lowlands, forested lands and open space. Generally, development is limited to scattered residential housing and isolated commercial or industrial sites, notably Union Camp and the SCE&G facilities.

## **Projected Growth**

### **Development Trends and Land Use**

#### **Fairfield County**

Countywide population projections indicate a gradual increase of 11.6% from 1990 to 2015. This growth is expected to be primarily in the Winnsboro area with less significant growth occurring in the Simpson and Ridgeway areas. It is anticipated that the I-77 Corridor will continue to be the focus of any new industrial development efforts

following the completion of utility improvements at the major interchanges. Highway - oriented commercial development, once relatively prominent along US 21 and US 321 has declined since the opening of I-77 which will likely attract most new commercial uses.

Like most predominately rural counties with scattered residential development, commercial uses beyond the Winnsboro area are found generally in singular locations, at intersections and along the more heavily traveled roads. As traffic increases, it is anticipated that modest growth of small commercial uses will occur, particularly near residential concentrations in the developing areas of Mitford, Lake Wateree, and south and west of Ridgeway. Figure 7 illustrates projected land use for the basin.

### **Richland County**

In the northeast and southeast portions of Richland County the pattern of growth is determined by its proximity to infrastructure and services. Richland northeast is expected to maintain its predominate position as the key residential and industrial area of the county. I-77, as in Fairfield County, will act as the catalyst for the county's new industrial base with the areas around Clemson, Longcreek and Hardscrabble roads as boundaries for developing residential enclaves. Population projections for the northeast area are estimated at a 60% increase from 1990 to 2010. Following this trend of a growing residential core will be expanding commercial strips, largely following the major highways. US 1 will remain the principal "commercial corridor" with increasing highway-oriented uses extending to the Kershaw County line.

For lower Richland County, the growth is expected to be significantly more modest as limited utility infrastructure and suitable industrial sites restrict the areas ability to attract business and industry. The far reaches of lower Richland will likely remain rural with scattered small scale commercial development to area needs. New large industrial developments are unlikely as most of the infrastructure investments have been made in the northeast and I-77 corridor areas. Additional residential development is expected to small and largely consist of small, isolated subdivisions or large lot estates.

### **Population and Employment Projections**

Table 15 reflects the general pattern of development described in the watersheds of Fairfield County, anticipating modest changes in population and jobs, while only portions of Richland County are likely to experience significant growth in new home building and business activity.



Table 15: Population and Employment Projections

| Basin Number | 1990 Population | 1990 Dwellings | 1990 Emp     | 2015 Population | 2015 Dwellings | 2015 Emp      |
|--------------|-----------------|----------------|--------------|-----------------|----------------|---------------|
| 3050103-090  | 96              | 33             | 26           | 107             | 34             | 100           |
| 3050103-010  | 44              | 15             | 12           | 49              | 15             | 50            |
| 3050104-020  | 782             | 269            | 550          | 873             | 278            | 1350          |
| 3050104-010  | 3,724           | 1,283          | 1,475        | 4,159           | 1,324          | 2,170         |
| 3050104-050  | 1,977           | 682            | 1,076        | 2,208           | 703            | 2,412         |
| 3050104-060  | 5,633           | 2,189          | 918          | 22,445          | 9,845          | 1,379         |
| 3050104-090  | 4,716           | 1,842          | 635          | 6,227           | 2,792          | 752           |
| 3050104-100  | 1,773           | 692            | 380          | 2,111           | 946            | 717           |
| 3050104-030  | 1,300           | 508            | 1,112        | 1,485           | 666            | 1,223         |
| <b>Total</b> | <b>20,045</b>   | <b>7,513</b>   | <b>6,184</b> | <b>39,664</b>   | <b>16,603</b>  | <b>10,153</b> |

### Needs Assessment and Projected Build-out Capacity

From examining Table 16, it is estimated that the 1990 wastewater flow generated is approximately 2.42 MGD for the basin. Of the 2.42 MGD estimated flow, current usage suggests an estimated 1.39 MGD is treated by septic tanks.

Projections for 2015 estimate a build-out flow of 4.72 MGD. Projections for septic tank treatment are expected to decline as a proportionate share of treatment methods, particularly in Richland County where large-scale residential subdivisions will require central sewer. Projected septic tank treatment is estimated at 1.57 MGD.

Demand for treatment is expected to increase overall by 2.30 MGD, with demand for central sewer treatment expected to increase 2.12 MGD over the next twenty years.

Table 16: Estimated Existing and Projected Flow

| Basin Number | 1990 Flow (l) | 1990 Dwellings | 1990 Emp | 2015 Flow (l) | 2015 Dwellings | 2015 Emp |
|--------------|---------------|----------------|----------|---------------|----------------|----------|
| 3050103-090  | 11,340        | 33             | 26       | 14,970        | 34             | 100      |
| 3050103-010  | 5,200         | 15             | 12       | 6,890         | 15             | 50       |
| 3050104-020  | 103,520       | 269            | 550      | 138,530       | 278            | 1350     |



Table 16 Continued: Estimated Existing and Projected Flow

| Basin Number | 1990 Flow (1)    | 1990 Dwellings | 1990 Emp.    | 2010 Flow (1)    | 2015 Dwellings | 2015 Emp.     |
|--------------|------------------|----------------|--------------|------------------|----------------|---------------|
| 3050104-010  | 461,270          | 1,283          | 1,475        | 536,590          | 1,324          | 2,170         |
| 3050104-050  | 251,270          | 682            | 1,076        | 319,440          | 703            | 2,412         |
| 3050104-060  | 654,530          | 2,189          | 918          | 2,515,320        | 9,845          | 1,379         |
| 3050104-090  | 544,510          | 1,842          | 635          | 716,030          | 2,792          | 752           |
| 3050104-100  | 208,030          | 692            | 380          | 254,720          | 946            | 717           |
| 3050104-030  | 189,360          | 508            | 1,112        | 215,040          | 666            | 1,223         |
| <b>Total</b> | <b>2,429,030</b> | <b>7,513</b>   | <b>6,184</b> | <b>4,717,530</b> | <b>16,603</b>  | <b>10,153</b> |

(1) Flows are measured in gallons per day

**Footnote:** Flow estimates were calculated on 100 gpd per capita, 10 gpd for I&I and a range of 30 to 50 gpd per employee based upon commercial or industrial use.

## Watershed Assessment: Water Quality Issues and Standards

### Rocky Creek (3050103-090)

#### Description

Rocky Creek originates near the Town of Chester and accepts drainage from Grassey Run Branch, Bull Run Creek, Hooper Creek (Melton Branch), Barbers Creek (McDaniels Branch, Waters Branch), and Bull Skin Creek. Further downstream, Beaverdam Creek enters Rocky Creek followed by Little Rocky Creek (Shannon Creek, Bell Creek (Stover Creek), Hodges Branch, and Turkey Branch. Rocky Creek drains into Cedar Creek Reservoir near the Town of Great Falls. There are a total of 176.3 stream miles in this watershed, all classified FW. Turkey Branch and its tributaries are located in northeast Fairfield County.

#### Water Quality Issues

There are no water quality issues identified that relate to the planning area.

## **Catawba River (3050103-010)**

### **Description**

The Catawba River flows out of the Cedar Creek Dam on Lake Wylie near the Town of Fort Mill, and is joined by Big Dutchman (Little Dutchman Creek), Dye Branch (Jones Branch), Manchester Creek, and Burgis Creek) before accepting drainage from the Sugar Creek watershed. Downstream from the Sugar Creek drainage, the Catawba River flows past the Catawba Indian Reservation and is joined by Haggins Branch, Sixmile Creek (Barber Creek), Ferry Branch, Abernathy Creek, Greene Creek, and the Twelvemile Creek watershed. Further downstream, the river accepts the drainage of Rock Water Spring Branch, Dunn Creek, and the Cane Creek watershed near the Town of Fort Lawn. The Catawba River then flows into Fishing Creek Reservoir, which is impounded by the Fishing Creek Dam. Bear Creek forms an arm of the reservoir. The Catawba River is dammed again just downstream of the Fishing Creek Dam and the flow diverted to form Great Falls Reservoir.

The Rocky Creek watershed drains into the section of Cedar Creek Reservoir between Dearborn Dam and the Cedar Creek Dam. Debutary Creek drains into and forms an arm of Cedar Creek Reservoir just above the Cedar Creek Dam. All the ponds, lakes and streams in the Rocky Creek watershed are classified FW. The lower reaches of the Catawba River sub-basin are located in the far northeast corner of Fairfield County near Mitford.

### **Water Quality Issues**

There are no water quality issues identified that relate to the planning area.

## **Big Wateree Creek (3050104-020)**

### **Description**

Big Wateree Creek accepts the drainage of Wall Creek, Willow Swamp Branch, Gaydens Creek, Scabber Branch, and Hogfork Branch before forming an arm of Wateree Lake. There are numerous lakes and ponds (13 - 22 acres) in the watershed used for recreation and flood control. All 64.2 stream miles are classified as FW. The sub-basin lies entirely within the northcentral-northeastern portion of Fairfield County.

## **Water Quality Issues**

While aquatic life uses are fully supported, recreational uses on Big Wateree Creek are impaired by elevated fecal coliform bacteria concentrations from non-point sources.

The Big Wateree Creek is also water quality limited for BOD-5, NH3-N, TRC and DO at the discharge point for the White Oak Conference Center. Wasteload allocations modelling has been conducted for the upper reaches of the Big Wateree and Wall Creeks.

## **Wateree River/Wateree Lake (3050104-010)**

### **Description**

The Catawba River flows out of Cedar Creek dam and is joined by Cedar Creek (Bell Branch, Rocky Creek, Gar Creek), McDowell Creek, Crooked Creek, and the Big Wateree Creek watershed to form the headwaters of the Wateree River and Wateree Lake. Little Wateree Creek originates near the Town of Winnsboro and accepts drainage from Horse Creek, McCulley Creek, Ready Creek, Minton Creek, (White Oak Branch), and Horse Branch before flowing into the Big Wateree Creek embayment. Langley Branch enter the lake just downstream of the confluence, and Taylor Creek and Dutchmans Creek (Cedar Fork, Lots Fork) form arms of the lake near Wateree Lake State Park. Moving downlake, streams draining into the lake include: Singleton Creek (Tranham Creek, Showerbath Branch, Little Beaver Creek), Stillhouse Branch, Colonels Creek, and White Oak Creek. There are a total of 453.8 stream miles in the watershed, all classified FW. Wateree Lake and the Wateree River form the eastern boundary of Fairfield County.

### **Water Quality Issues**

Catawba River - Aquatic life uses are fully supported at the site just downstream of the confluence with Cedar Creek.

Wateree Lake - There are no impaired recreational usages of the lake. Eutrophication studies classified the headwaters, Big Wateree Creek arm, and the dam area as Category I for excessive nutrients and high productivity. A Phase I Diagnostic/Feasibility Study is currently underway, with study objectives emphasizing sediment and phosphorus loading. Despite decreasing trends in total phosphorus and nitrogen concentrations, the rate of decrease is very slow and the lake is still highly productive. Aquatic life uses may not be supported in the Dutchmans Creek arm due to elevated concentrations cadmium, chromium, copper, and zinc measured in water. This

is compounded by significantly increasing trends in pH and turbidity.

Aquatic life uses at the midlake site also may not be supported due to elevated concentrations of heavy metals in both water and sediment. Nearer the dam, aquatic life uses are partially supported due to a significantly declining trend in dissolved oxygen concentration, compounded by high concentrations of zinc measured in water in 1990 and 1991. Recreational uses are fully supported, but are threatened by a significantly increasing trend in fecal coliform bacteria concentrations.

The metals concentration in Wateree Lake sediment is high relative to freshwater streams in South Carolina; however, it is similar to values seen in other lakes in the State. It is recognized that aerial deposition is a potentially significant source of these metals.

No contaminants in the fish population were measured at levels that pose a threat to human health.

Both Wateree Lake and Little Wateree Creek are included on the Section 319 list of waters impacted by agricultural activities, and the Section 304 list for waters impacted by non-toxic pollutants.

Little Wateree Creek - Aquatic life uses are fully supported, and a significantly decreasing trend in total phosphorus concentration suggests improving conditions. Recreational uses are not supported at this site (monitoring station) due to fecal coliform bacteria excursions.

Ready Creek - Ready Creek is water quality limited for NH<sub>3</sub>-N, TRC and DO at the discharge point for Richard Winn Academy (SC0028134). The lower reach of Ready Creek has been modeled for wasteload allocations.

McCulley Creek - The ground water in the area of the above storage tanks owned by Winnsboro Petroleum Company is contaminated with petroleum products as a result of spills and leaks. Surface water has been affected by ground water contamination. The facility is under enforcement action.

### **Sawneys Creek (3050104-050)**

#### **Description**

Sawneys Creek originates near the Town of Ridgeway and drains into the Wateree River. Thorntree Creek and Bee Branch drain into Sawneys Creek. There are a total of 107.8 stream miles in this watershed, all classified FW. This basin lies largely in Fairfield County.

## **Water Quality Issues**

Recreational uses are not supported at either of two monitoring stations on the Creek due to fecal coliform bacteria under Class FW standards. At the upstream location, aquatic life uses are fully supported based upon macroinvertebrate community data, but may be threatened due to an elevated concentration of cadmium and a very high concentration of zinc measured in 1991. A significantly decreasing trend in pH was also noted. A significantly decreasing trend in fecal coliform bacteria concentration at the upstream site suggests improving conditions. Aquatic life uses are fully supported at the downstream site.

The discharge from Kennecott Mining (SC0041378) is to be eliminated. Fairfield Nursing Home (ND 0067008) operates a sprayfield.

Nonpoint source contributions are considered a low threat although fecal coliform levels may require future TMDL development.

## **Twentyfive Mile Creek**

### **Description**

Twentyfive Mile Creek originates near the Town of Blythewood and accepts drainage from Simmons Creek, Ben Hood Branch, Round Top Branch, Rice Creek, Sandy Branch (Bridge Creek, Reedy Branch, Tuppler Branch), Rooky Branch, Flat Branch, and Bear Creek (Donnington Branch). Further downstream, Big Branch enters Twentyfive Mile Creek followed by Yankee Branch, Jim Branch (Spring Branch), Briar Branch, Dodge Branch, Horsepen Creek (Wolfpit Branch), Bell Branch (Rook Branch), Cook Run, Flat Branch, and Beaverdam Branch before draining into the Wateree River. There are several ponds and lakes (10-75 acres) in the watershed used for recreation and irrigation, and a total of 255.5 stream miles in this watershed, all classified FW. The majority of this watershed lies within northeast Richland County and portions of southeast Fairfield County.

### **Water Quality Issues**

Twentyfive Mile Creek - Aquatic life uses are fully supported based on macroinvertebrate community data, and physical and chemical data. Significantly decreasing trends in five-day biochemical demand and total phosphorus concentration suggest improving conditions. Recreational uses are only partially supported at this site (monitoring station) due to fecal coliform bacterial excursions.



Bear Creek - Aquatic life uses may be only partially supported due to a very high concentration of zinc measured in water in 1991. Although there were dissolved oxygen excursions, these were typical of values seen in blackwater systems and were considered natural, not standards violations. Recreational uses are not supported at this site due to fecal coliform bacteria excursions.

### **Spears Creek (3050104-090)**

#### **Description**

Spears Creek originates near the Town of Elgin and flows past Fort Jackson US Army Base before draining into the Wateree River. Spear Creek flows through several small lakes including an unnamed 85-acre lake before accepting the drainage of Sloan Branch, Kelly Creek (White Pond), Haig Creek, McCaskill Creek (Rununder Branch, Otterslide Banch), and Raglins Creek. Further downstream Madraw Branch, Moke Branch, and Pigeon Roost Branch enters Spears Creek near its confluence with the Wateree River. All the streams in this watershed are classified FW. The northwest corner and southern portions of this watershed are located in Richland County.

#### **Water Quality Issues**

Spears Creek - There are two monitoring sites along Spears Creek (Kershaw County). Excursions of pH occurred at both sites; however, these were typical of values seen in blackwater systems and were considered natural, not standards violations. Aquatic life uses are fully supported at the upstream site based on macroinvertebrate community data, but may be threatened by a significantly increasing trend in turbidity. A significantly increasing trend in dissolved oxygen and significant decreasing trends in five-day biochemical oxygen demand and total phosphorus suggest improving conditions. Also, although the use of DDT was banned in 1973, it is still very persistent in the environment. Recreational uses are only partially supported at this site due to fecal coliform bacteria excursions from nonpoint sources. Aquatic life uses are also fully supported at the downstream site. Recreational uses are not supported at this site due to fecal coliform bacteria excursions.

Spears Creek is water quality limited for NH-3N, DO, TRC and BOD-5 for the discharge point of the Valhalla Company (SC0043494). This discharge is cited for elimination.

Also affecting a Spears Creek tributary is the chromium contaminated ground water in the vicinity of the surface impoundments owned by Homelite Textron. This site is under EPA remedial action. The tributary has been modeled for a wasteload allocation.



## **Colonels Creek (3050104-100)**

### **Description**

Colonels Creek originates near the community of Pontiac and flows through the Fort Jackson US Army Base property and into the Wateree River. Colonels Creek flows through DuPre Pond and Messers Pond, and accepts drainage from Buffalo Creek and Bee Branch on US property. Colonels Creek then accepts drainage from Jumping Run Creek and Leesburg Branch before flowing through Murray Pond and Goodwill Pond. All of the streams and ponds are classified FW. All of this sub-basin lies within Richland County.

### **Water Quality Issues**

Colonels Creek - Aquatic life and recreational uses are fully supported. Although there were pH excursions, these were typical values in blackwater systems and were considered natural, not standards violations. No known groundwater or nonpoint source concerns were identified.

## **Wateree River (3050104-030)**

### **Description**

Downstream from the Wateree Dam, the Wateree River accepts drainage from Grannies Quarter Creek watershed, Sawneys Creek watershed, Rocky Branch and Sanders Creek (Gum Swamp Creek). Camp Creek enters the river downstream near the City of Camden, as does the Twentyfive-mile creek watershed, Gillies Creek, Big Pine Tree Creek watershed, Town Creek, and Gillies Ditch (Jumping Gully). Further downstream, the Swift Creek watershed enters the river followed by Rafting Creek (Ellerbee Mill Pond, Bracey Mill Creek, Little Rafting Creek, Dinkins Mill Pond), the Spears Creek watershed, Gum Swamp Branch (Robert Branch), and the Colonels Creek watershed. Gum Swamp Branch flow through several oxbow lakes that include Ruggs Lake, Big Lake, Little Lake, and Dry Swamp Lake. The Wateree River flows past the Town of Eastover and just prior to its confluence with the Congaree River, Little River drains into the Wateree River. Kohlers Old River connects Halfway Creek to the river. The southeastern edge of Richland County lies in this sub-basin.

### **Water Quality Issues**

Wateree River - There are four monitoring sites in this basin with two located in the County. One site is located at the basin's northern most point, and the second is at

its southern most point. Recreational uses are fully supported at all four sites. Aquatic life uses are fully supported in the northern station (CW-206), but may be threatened by a significantly increasing trend in turbidity. Significantly decreasing in total suspended solids, total phosphorus, and total nitrogen concentrations suggest improving conditions.

At the confluence of the with the Congaree River (southern station: CW-222), aquatic life uses are fully supported, but may be threatened by a significantly decreasing trend in dissolved oxygen concentration and a significantly increasing trend in turbidity. High concentrations of zinc were measured in water in 1989 and 1993. Significantly decreasing trends in total phosphorus and total nitrogen concentrations suggest improving conditions. Wasteload allocation modelling has been conducted for the Richland County segment of the Wateree River.

## Management and Policy Issues

### Management Agencies & Service Provision

There are four management agencies recommended for plan implementation in the basin:

#### A. Management Agency: Fairfield County

**Management Agency Area:** Northeast Fairfield County

**General Policy:** Under sole management agency direction, Fairfield County will implement the provisions of the plan for the prescribed management agency area with a portion under contract by the Midford Water & Sewer Company and treatment service by the Town of Great Falls.

| Facility      | Provider            | Basin (s)                                     | Permitted Capacity |
|---------------|---------------------|---|--------------------|
| Catawba River | Town of Great Falls | 3050103-090<br>3050103-010<br>3050104-020 (p) | 1.4 MGD            |

(p) portion of the basin

#### B. Management Agency: Town of Winnsboro

**Management Agency Area:** Central Fairfield County

**General Policy:** Under sole management agency direction, the Town of Winnsboro is to implement the provisions of the plan for the prescribed management agency area with treatment at the Jackson Creek plant.

| Facility      | Provider          | Basin (s)       | Permitted Capacity |
|---------------|-------------------|-----------------|--------------------|
| Jackson Creek | Town of Winnsboro | 0305104-010 (p) | 1.6 MGD            |

(p) portion of the basin

**C. Management Agency: Town of Ridgeway**  
**Management Agency Area: Southeast Fairfield County**

**General Policy:** Under sole management agency direction, the Town of Ridgeway is to implement the provisions of the plan in the prescribed management agency area with treatment the Cedar Creek plant.

| Facility    | Provider         | Basin (s)   | Permitted Capacity |
|-------------|------------------|---|--------------------|
| Cedar Creek | Town of Ridgeway | 0305104-010 (p)<br>0305104-050<br>0305104-060 (p) | 0.120 MGD          |

(p) portion of the basin

**D. Management Agency: Richland County**  
**Management Agency Area: Portions of northeast and southeast Richland County**

**General Policy:** Under sole management agency direction, Richland County is to implement the provisions of the plan as prescribed by its management agency area; such that, it is recognized that Wildewood Utilities operates as the County's franchise agent for portions of northeast Richland County, but must in all cases have Richland County concurrence on all plan implementation actions.

| Facility     | Provider        | Basin (s)   | Permitted Capacity               |
|--------------|-----------------|---|----------------------------------|
| Spears Creek | Wildewood Util. | 0305104-060 (p)<br>0305104-090 (p)                    | 0.75 MGD Constr.<br>1.75 Planned |
| No Facility  | Richland County | 0305104-030 (p)<br>0305104-090 (p)<br>0305104-100 (p) | N/A                              |

(p) portion of the basin

## **Long Range Basin Planning**

While the 208 Water Quality Management Plan will act as the principal guide in directing actions taken by local designated management agencies, the plan also recognizes the impact of other planning efforts. For this reason, the 208 Plan attempts to blend related planning activities to better coordinate infrastructure needs and assist member local governments in their efforts to control the effects of growth and development on the environment.

### **Kershaw County 208 Water Quality Management Plan (Not Adopted)**

Under its role as the designated management agency for the unincorporated area, Kershaw County recently completed its own 208 Water Quality Management Plan. Generally covered by the statewide 208 Plan, Kershaw County specifically undertook this effort to analyze local alternative methods of providing wastewater for the southern portion of the County where growth is widely expected to occur.

While the study provided a useful analysis of the issues confronting the County, the plan has not yet been adopted. Continued discussion among the principal players, City of Camden, Kershaw County and Town of Lugoff is expected while no immediate resolution is anticipated.

The area adjacent and affected by Richland County is the Elgin planning district. The plan calls for the continuation of the Spears Creek plant operated by Wildewood Utilities with expectations for expansion based upon demand as needed.

## **Long Range Comprehensive Land Use Planning**

### **Fairfield County**

Currently, Fairfield County has not adopted zoning, negating the state requirement for a long-range development planning. However, the County Planning in anticipation of infrastructure needs proceed and adopt a land use plan, the *Comprehensive Land Use & Development Plan, Fairfield County, 1992*. In the document, it cited the I-77 corridor as the key development area for industrial and commercial development. Further, the plan forecasted the areas around Lake Wateree and Mitford as prime residential areas which given its proximity to sensitive streams and the lake suggests the need for public sewer.

## Richland County

Since 1979, Richland County has had zoning, and subsequently has had several land use plans which address the basin. There are two planning subareas: the *I-77 Corridor* and the *Northeast Area*.

The *I-77 Corridor* plan generally covers the reaches of I-77 to Hardscrabble Road and the extreme northeast portion of the County, while the *Northeast Area* plan addresses the area south of Rimer Pond Road to I-20 and the Kershaw County line. Both plans identify the area as having strong growth potential over the next twenty years with medium density residential (4 to 9 dwellings per acre) as the dominant land use. Similarly, both plans stress the need for adequate infrastructure to support additional industrial and commercial needs, with the I-77 area as a target for industrial uses and Two Notch Road and I-20 for commercial activity.

Again, each plan notes the need for a continuing extension of centralized sewer in each of these areas to sustain the impending growth and to protect the land from poor environmental management. Neither plan identifies the need for additional treatment facilities as both the I-77 and northeast areas are served by the City of Columbia and Wildewood Utilities, respectively.



## Saluda-Edisto River Basin Assessment and Management

### Existing Basin Inventory

#### Water Resources

##### General

The Saluda-Edisto River Basin consists of three sub-basins which cover the central and western portions of the four-county 208 planning area: the Saluda River, Congaree River and Edisto River. The entire Basin encompasses some four million acres and reaches from the Piedmont to the Coastal Plain. It includes portions of Newberry, Lexington and Richland Counties and is identified as part of Watershed Management Units 0201, 0202 and 0203. Table 17 lists the related basin and watershed relationships.

**Table 17: River Basins & Watersheds**

| Basin Name    | Sub-Basin Name | Watershed Name                  | Counties             |
|---------------|----------------|---------------------------------|----------------------|
| Saluda-Edisto | Saluda         | Saluda River (U)                | Newberry             |
|               |                | Saluda River (L)                | Newberry             |
|               |                | Little River                    | Newberry             |
|               |                | Clouds Creek                    | Lexington            |
|               |                | Lake Murray                     | Lexington & Newberry |
|               |                | Hollow Creek                    | Lexington            |
|               | Congaree       | Saluda River                    | Richland & Lexington |
|               |                | Congaree River (U)              | Richland & Lexington |
|               |                | Congaree Creek                  | Lexington            |
|               |                | Gills Creek                     | Richland             |
|               |                | Sandy Creek                     | Lexington            |
|               |                | Cedar Creek                     | Richland             |
|               |                | Toms Creek                      | Richland             |
|               |                | Congaree River (L)              | Richland             |
|               | Edisto         | Chinquapin & Lightwood Knot Cr. | Lexington            |
|               |                | N. Fork Edisto River (U)        | Lexington            |
|               |                | Black Creek                     | Lexington            |
|               |                | N. Fork Edisto River (L)        | Lexington            |
|               |                | Bull Swamp Creek                | Lexington            |

Footnote: (U) Upper portion; (L) Lower portion

## **Newberry County**

### **Saluda River Basin**

The Saluda River flows southeast along the southern border of the county. Near Chappells, the Saluda River has an average flow of 1,991 cfs, yet can range from 8 cfs to 63,700 cfs. With increasing distance downstream, flow is more variable because rainfall and groundwater support lessens. In the smaller streams and tributaries, the flow is more variable because they are below many hydropower facilities. Decreased groundwater support and average precipitation in southern Piedmont regions also have a variable affect on stream flow. Lake Murray, constructed in 1930, has the fifth largest surface area and the third largest volume of all the water bodies in the state. Located primarily in northern Lexington, it is used for hydroelectric power, recreation, and water supply.

Groundwater in the Saluda River basin is usually limited to fracture and joint zones and deep saprolite layers. The Shallow Sedimentary Rock Aquifer has been utilized mainly for domestic water uses. Shallow wells, 34-563 feet deep tap groundwater at the saprolite layer of sediment. The permeability of this layer decreases lower in the Piedmont which in turn decreases rain water infiltration. As a result, these wells yield only 2-400 gpm and are apt to run dry. The Shallow Sedimentary Rock Aquifer is used by Newberry County only as a secondary source for public water supply. Aquifers are recharged directly by precipitation or indirectly by groundwater storage in the saprolite layer. Groundwater obtained from the Saluda River basin in Newberry County is generally found to have good water quality (S.C. Water Resources Commission, 1983).

## **Lexington County**

### **Saluda River Basin**

The Saluda River, found in the Piedmont of Lexington County, has a stream flow modified by the water discharges from Lake Murray. From Newberry and Saluda Counties, the Saluda River flows through Lake Murray until it converges with the Broad River to form the Congaree River. Below Lake Murray, the Saluda has been found to average an annual stream flow of 2,929 cfs near Columbia. Generally, flow is greater than 430 cfs. In the smaller streams and tributaries, the flow is more variable because they are affected by many hydropower facilities. Decreased groundwater support and average precipitation in southern Piedmont regions also have a variable affect on stream flow. Lake Murray, constructed in 1930, has the fifth largest surface area and the third largest volume of all the water bodies in the state. Located primarily in northern Lexington, it is used for hydroelectric power, recreation, and water supply. Classified as mesoeutrophic, or having moderate to high nutrient levels, Lake Murray has generally good and improving water quality. However, some problem areas occur

in the upper reaches of the lake and in small coves where point and non-point source pollution enters from the upper Saluda and its tributaries.

Groundwater in the northern portion of the Saluda River basin provides Lexington County with a public water supply source. Two zones, the Shallow Sedimentary Rock Aquifer, and the Crystalline Rock Aquifer have been utilized for this purpose. Shallow wells, 60-100 feet deep tap groundwater at the saprolite layer of sediment. The permeability of this layer decreases lower in the Piedmont Province which in turn decreases rain water infiltration. As a result, these wells are apt to run dry. The Shallow Sedimentary Rock Aquifer is used by Lexington County only as a secondary source for public water supply due to limited availability compared to other sources found in the Coastal Plain Province. The Crystalline Rock Aquifer is composed of fractured igneous and metamorphic rocks. This deeper bedrock aquifer provides higher yields in faulted or jointed areas. All aquifers are recharged directly by precipitation or indirectly by groundwater storage in the saprolite layer. Around the Leesville area, the Tertiary Sand Aquifer System is a source of public water supply. Wells in this aquifer yield 50-150 gallons per minute. However, these groundwaters have been found to contain concentrations of Radium-226 which exceed safe drinking water standards. Radium-226, which disintegrates from thorium, is thought to have originated in the granitic outcrop areas near the Fall Line. Groundwater obtained from other sources of the Saluda River basin in Lexington is generally found to have good water quality (S.C. Water Resources Commission, 1983).

Wetlands in the Saluda River basin are minimal due to soil type and topography. Appling, Tatum, Georgeville, and Lakeland soils contribute to an average slope of seven percent in various watersheds of the basin. Scattered wetlands are found around Lake Murray and Twelvemile and Hollow Creeks (S.C. Water Resources Commission).

The northern Piedmont Province holds about 18 percent of Lexington's wetlands. Mostly bottomland hardwoods, the wetlands of the Tatum-Georgeville-Helena soils mixed with some Nason and Herndon soils are primarily deciduous hardwood trees occurring in swamps or other partially or occasionally inundated environments.

### **Congaree River Basin**

The Congaree River basin is comprised of the Congaree River and its tributaries below the convergence of the Saluda and Broad Rivers. Stream flow near Columbia is very stable. Average annual stream flow is 9,425 cfs. This uniform, well-sustained flow provides a good water supply for Lexington County. Water quality of the Congaree River is generally good with exceptions arising as a result of municipal point source discharges and urban runoff (S.C. Water Resources Commission, 1983).

The Middendorf Aquifer System lies under the entire Congaree River basin. The Tertiary Sands Aquifer System overlies the Middendorf in the northern reaches while Black Mingo Aquifer System overlies it in the south. The stable water supply of the

Middendorf provides acidic, soft water, low in fluoride and chloride for this basin. In some isolated wells in the Cayce and West Columbia areas, acceptable drinking water standards are exceeded for naturally occurring radiation (S.C. Water Resources Commission, 1983).

There is an abundance of wetlands along the Congaree River, approximately 18 percent of the land area is forested wetland. Wetlands are also found in the Congaree Creek and Sandy Run areas (S.C. Water Resources Commission, 1995).

### **Edisto River Basin**

In the western region of Lexington County, adjacent to Aiken County, the Chinquapin and Lightwood Knot Creeks converge to form the North Fork Edisto River in the Edisto River Sub-basin. Black Creek and Bull Swamp Creek contribute to the North Fork Edisto further south, flowing in a southeasterly direction. Stream flow in these waters is well-sustained. Historical analysis has indicated declining concentrations of total phosphorus and biochemical oxygen demand as a result of pollution control programs. The total phosphorus concentration exceeded EPA criteria of 0.1 mg/l and violated state standards for fecal coliform bacteria as a result of livestock and feedlot activity. Also, the nitrogen/phosphorus (N/P) ratio was lowest in the Edisto basin because of the excess phosphorus entering streams from point and non-point sources. A high N/P ratio is an indicator of a balanced aquatic ecosystem and an undisturbed watershed (S.C. Water Resources Commission, 1993).

In the Edisto River basin, near the North Fork Edisto River, there is a variable groundwater supply for Lexington County. Near the Fall Line, crystalline rock aquifers produce low yields, whereas further south, the Middendorf, Tertiary Sands, and Black Mingo Aquifer Systems are more utilized for public supply. The Middendorf and Tertiary Sand aquifers are the preferred systems of Lexington County primarily because of the large yields of available water. The Black Mingo is only partly in Lexington and is a secondary source. Sediments of the Middendorf Aquifer System lie near the surface of Lexington County and groundwater movement through the system is to the south and southeast. It produces soft, acidic water, very low in dissolved solids, which makes it corrosive to metal surfaces. The Tertiary Sand Aquifer System is composed of highly permeable quartzose sands with sandy clays and inter-fingered limestones. Direct precipitation recharges this aquifer in the outcropped areas adjacent to Orangeburg County. Water quality is acidic, high in iron and low in dissolved solids. Some wells in this area may contain hydrogen sulfide gas. Natural radioactivity, in excess of safe drinking water standards, occurs in isolated areas of the Edisto River basin. The Black Mingo Aquifer System is composed of fine sand, silty clays, fullers earth fossiliferous limestones, and some mixed shales (S.C. Water Resources Commission, 1993).

Wetlands of the Edisto River basin are concentrated along the larger water bodies such as the North Fork Edisto River, Black Creek and Bull Swamp Creek. Generally,



total percentage of wetlands found in a watershed of the Edisto basin increase toward the southeastern areas of Lexington. The North Fork Edisto watershed, from its origin to Black Creek has the highest percentage of wetlands, approximately eight percent, and these are classified as forested wetland (Department of Health and Environmental Control, 1995).

The entire Coastal Plain region has many soils which can be classified as wetlands. The large Lakeland Blaney soil association along with some Fuquay soils holds 46 percent of Lexington's total wetland area. Most of this acreage is bottomland hardwoods along streams or rivers. Twenty-four (24) percent of all wetlands is held in Lakeland, Fuquay, Alga, Dothan, and Vacluse soils located in the southern areas of the county.

## **Richland County**

### **Saluda River Basin**

The southeastern boundary of the Saluda River basin fringes along the extreme western border of Richland county in the Piedmont Province. Only a small northern section of Lake Murray is within Richland County which contributes very little to the overall flow of the sub-basin. From Newberry and Edgefield Counties, the Saluda River flows through Lake Murray until it converges with the Broad River to form the Congaree River. Below Lake Murray, the Saluda has been found to average an annual stream flow of 2,929 cfs near Columbia. Generally, flow is greater than 430 cfs. In the smaller streams and tributaries, flows are more variable because they are below many hydropower facilities. Decreased groundwater support and average precipitation in southern Piedmont regions also have a variable affect on stream flow. Lake Murray, constructed in 1930, has the fifth largest surface area and the third largest volume of all the water bodies in the state. Located primarily in northern Lexington County, it is used for hydroelectric power, recreation, and water supply. Classified as mesoeutrophic, or having moderate to high nutrient levels, Lake Murray has generally good and improving water quality. However, some problem areas occur in the upper reaches of the lake and in small coves where point and non-point source pollution enters from the upper Saluda and its tributaries. Groundwater of the Saluda River Sub-basin is used minimally as only 6.5 percent of the population was within its boundaries in 1983(S.C. Water Resources Commission, 1983).

Wetlands in the Saluda River basin of Richland County are found on the Tatum-Georgeville-Herndon soil association of the Piedmont Province. Since this basin has no major tributaries or surface water in Richland County, wetland acreage is negligible.

## Congaree River Basin

The Congaree River basin is comprised of the Congaree River and its tributaries below the convergence of the Saluda and Broad Rivers. A 45 mile segment of the Congaree, located between the Congaree Creek and the US Highway 601 Bridge is to be placed in the Scenic Rivers Program. Most of Richland County's agriculturally productive soils are on the Middle Coastal Plain, in the Congaree River Sub-basin. Near Columbia, stream flow on the main stem of the Congaree is very stable. Average annual stream flow is 9,425 cfs. This uniform, well-sustained flow provides a good source of water supply for Richland County. Eastern tributaries, such as Gills Creek, originate in almost impermeable soils which result in a less sustained flow. Water quality of the Congaree River is generally good with exceptions arising from municipal point source discharges and urban runoff (S.C. Water Resources Commission, 1983).

The Middendorf Aquifer System lies under the entire Congaree River basin. The Tertiary Sands Aquifer System overlies the Middendorf in the northern reaches while Black Mingo Aquifer System overlies it in the south. The stable water supply of the Middendorf provides acidic, soft water, low in fluoride and chloride for this basin. Near Eastover, groundwater, used mainly for domestic activities, is taken from the Black Mingo which yields 3 to 387 gpm (S.C. Water Resources Commission, 1983).

An abundance of wetlands are found along the Congaree River, and are a part of the Congaree Swamp National Monument. Comprising 22,000 acres of land in Richland County, the monument site is described as a "large flood plain complex," which has various types of forest lands according to elevation differences (Knowles and Brinson 1996). Deciduous forested wetlands are the predominate tree cover and may be the tallest temperate deciduous forest in the world. Also, fresh water non-forested wetlands and bottomland hardwoods are present in almost the same concentration.

## Treatment Facilities

In the basin there 58 industrial, 37 community and 14 municipal active NPDES permitted dischargers. In Table 18 are the dischargers listed by basin.

Table 18: Discharges By County

| Facility Name        | NPDES Number | Watershed Management Code | Receiving Stream | Type        | Cnty     |
|----------------------|--------------|---------------------------|------------------|-------------|----------|
| Champion Intl. Corp. | SC0022730    | 03050109-150              | Saluda River     | Minor Ind.  | Newberry |
| City of Newberry     | SC0024490    | 03050109-150              | Bush River       | Mjr. Munic. | Newberry |



Table 18 Continued: Discharges By County

| Facility Name             | NPDES Number                | Watershed Management Code | Receiving Stream        | Type        | Cnty      |
|---------------------------|-----------------------------|---------------------------|-------------------------|-------------|-----------|
| Newberry W&SA             | SC0040860                   | 03050109-150              | Bush River              | Min. Munic. | Newberry  |
| Federal Paper Board       | SC0036064                   | 03050109-150              | Bush River Trib.        | Minor Ind.  | Newberry  |
| Hermitage Industries      | SC0039187                   | 03050109-180              | W. Creek Trib.          | Minor Ind.  | Newberry  |
| Columbia Farms            | SC0041599                   | 03050109-180              | Gin Branch              | Minor Ind.  | Lexington |
| SCPRT Dreher Is.          | SC0026948                   | 03050109-190              | Lake Murray             | Minor Com.  | Newberry  |
| Newberry W&SA Bedford Way | ND0062219                   | 03050109-190              | Spray Irrigation        | Minor Com.  | Newberry  |
| Mallard Bay SD AAA Util.  | ND0019640                   | 03050109-190              | Tile Field              | Minor Com.  | Newberry  |
| Smallwoods SD CWS, Inc.   | ND0007994                   | 03050109-190              | Low Pressure Irrigation | Minor Com.  | Newberry  |
| Rollingwood S/D           | SC0022845                   | 03050109-190              | Lake Murray Trib.       | Minor Com.  | Lexington |
| Georgia Pacific           | SC0022641                   | 03050109-190              | Camping Creek           | Minor Ind.  | Newberry  |
| Newberry W&SA             | SC0004471                   | 03050109-190              | Camping Creek           | Min. Munic. | Newberry  |
| Mli-Dera Garden Apts.     | SC0032042                   | 03050109-190              | Steven's Creek          | Minor Com.  | Newberry  |
| SCE&G McMeekin Station    | SC0002046<br>(2 discharges) | 03050109-210              | Saluda River            | Mjr. Ind.   | Lexington |
| SCE&G Saluda Hydro        | SC0002071<br>(5 discharges) | 03050109-210              | Saluda River            | Mjr. Ind.   | Lexington |
| Allied Fibers             | SC0003557                   | 03050109-210              | Saluda River            | Mjr. Ind.   | Lexington |

Table 18 Continued: Discharges By County

| Facility Name          | NPDES Number | Watershed Management Code | Receiving Stream          | Type        | Cnty      |
|------------------------|--------------|---------------------------|---------------------------|-------------|-----------|
| Philips Components     | SC0003425    | 03050109-210              | Saluda River & Lorick Br. | Mjr. Ind.   | Lexington |
| Woodland Hills S/D     | SC0029475    | 03050109-210              | Saluda River              | Minor Com.  | Lexington |
| Bush River Utilities   | SC0032743    | 03050109-210              | Saluda River              | Minor Com.  | Lexington |
| I-20 Plant CWS, Inc.   | SC0035564    | 03050109-210              | Saluda River              | Minor Com.  | Lexington |
| Friarsgate S/D         | SC0036137    | 03050109-210              | Saluda River              | Mjr. Com.   | Lexington |
| Riverbanks Zoo         | SC0037613    | 03050109-210              | Saluda River              | Minor Ind.  | Lexington |
| Tenneco #6033          | SC0045535    | 03050109-210              | Saluda River              | Minor Ind.  | Lexington |
| EMRO MKTG #62          | SC0040321    | 03050109-210              | Saluda R. Trib.           | Minor Ind.  | Lexington |
| Town of Lexington      | SC0026735    | 03050109-210              | 12 Mile Crk.              | Mjr. Munic. | Lexington |
| Victorian Lake Estates | SC0034932    | 03050109-210              | 12 Mile Crk.              | Minor Com.  | Lexington |
| Fast Fare #SC-616      | SC0045586    | 03050109-210              | 12 Mile Crk.              | Minor Ind.  | Lexington |
| Oak Grove Estates      | SC0031201    | 03050109-210              | 12 Mile Crk.              | Min. Munic. | Lexington |
| Oak Grove Elem.        | SC0026018    | 03050109-210              | 12 Mile Crk.              | Min. Com.   | Lexington |
| Carolina Steel & Wire  | SC0026239    | 03050109-210              | 12 Mile Crk.              | Min. Ind.   | Lexington |
| Vanarsdale S/D         | SC0030945    | 03050109-210              | 12 Mile Crk.              | Minor Com.  | Lexington |
| Sun Machinery          | SC0046221    | 03050109-210              | 12 Mile Crk.              | Minor Ind.  | Lexington |

Table 18 Continued: Discharges By County

| Facility Name                    | NPDES Number | Watershed Management Code | Receiving Stream | Type        | Cnty      |
|----------------------------------|--------------|---------------------------|------------------|-------------|-----------|
| Watergate CWS, Inc.              | SC0027162    | 03050109-210              | 14 Mile Crk.     | Min, Munic. | Lexington |
| Lakewood Utilities               | SC0034436    | 03050109-210              | 14 Mile Crk.     | Minor Com,  | Lexington |
| City of W. Columbia<br>Whiteford | SC0043541    | 03050109-210              | 14 Mile Crk.     | Min. Munic. | Lexington |
| Alpine Utilities                 | SC0029483    | 03050109-210              | Stoop Creek      | Minor Com.  | Lexington |
| Keenan Oil/<br>Phillips 66       | SC0041998    | 03050109-210              | Double Branch    | Min. Ind.   | Lexington |
| SCE&G                            | SC0044296    | 03050109-210              | Double Branch    | Min. Ind.   | Lexington |
| Gilbert Elementary<br>School     | ND0013587    | 03050109-210              | Spray Irrigation | Minor Com.  | Lexington |
| Lexington High School            | ND0067016    | 03050109-210              | Spray Irrigation | Minor Com.  | Lexington |
| Windy Hill S/D                   | ND0067075    | 03050109-210              | Spray Irrigation | Minor Com.  | Lexington |
| Willows End S/D                  | ND0068861    | 03050109-210              | Spray Irrigation | Minor Com.  | Lexington |
| Cayce Quarry                     | SC0001058    | 03050110-010              | Congaree River   | Minor Ind.  | Richland  |
| Carolina Eastman                 | SC0001333    | 03050110-010              | Congaree River   | Mjr. Ind.   | Richland  |
| Westinghouse Electric Corp.      | SC0001848    | 03050110-010              | Congaree River   | Mjr. Ind.   | Richland  |
| SCE&G Hydro Plant                | SC0002062    | 03050110-010              | Congaree River   | Minor Ind.  | Richland  |
| City of Columbia<br>WWTP         | SC0020940    | 0305110-010               | Congaree River   | Mjr. Munic. | Richland  |

Table 18 Continued: Discharges By County

| Facility Name            | NPDES Number | Watershed Management Code | Receiving Stream  | Type        | Cnty      |
|--------------------------|--------------|---------------------------|-------------------|-------------|-----------|
| City of Cayce WWTP       | SC0024147    | 03050110-010              | Congaree River    | Mjr. Munic. | Lexington |
| Teepak, Inc./ Coria Div. | SC0033367    | 03050110-010              | Congaree River    | Minor Ind.  | Richland  |
| ERPSD WWTP               | SC0038865    | 03050110-010              | Congaree River    | Mjr. Minic. | Richland  |
| City of W. Columbia WTP  | SC0041076    | 03050110-010              | Congaree River    | Minor Ind.  | Lexington |
| SC Dept. of Agriculture  | SC0041386    | 03050110-010              | Congaree River    | Minor Ind.  | Richland  |
| Altantic Soft Drink Co.  | SC0043125    | 03050110-010              | Congaree River    | Minor Ind.  | Richland  |
| SCE&G Colt Powr Plt.     | SC0044814    | 03050110-010              | Congaree River    | Minor Ind.  | Lexington |
| Chevron USA Cayce        | SC0042455    | 03050110-010              | Congaree R. Trib. | Minor Ind.  | Lexington |
| Amerada Hess Corp.       | SC0044971    | 03050110-010              | Congaree R. Trib. | Minor Ind.  | Lexington |
| Young's Food Store       | SC0045705    | 03050110-010              | Congaree R. Trib. | Minor Ind.  | Lexington |
| Tarmac Mid-Atlantic      | SC0002364    | 03050110-010              | Rocky Branch      | Minor Ind.  | Richland  |
| EMBRO Mktg #289          | SC0045128    | 03050110-010              | Rocky Br. Trib.   | Minor Ind.  | Richland  |
| Silver Lake MHP          | SC0031321    | 03050110-010              | Toms Branch       | Minor. Com. | Lexington |
| Rolling Meadows MHP      | SC0033685    | 03050110-010              | Toms Branch       | Minor Com.  | Lexington |
| SCDOT I-26 Rest Area     | SC0040339    | 03050110-010              | Savany Hunt Crk.  | Minor Com.  | Lexington |

Table 18 Continued: Discharges By County

| Facility Name               | NPDES Number | Watershed Management Code | Receiving Stream | Type        | Cnty      |
|-----------------------------|--------------|---------------------------|------------------|-------------|-----------|
| Charles Towne S/D Utility   | SC0032760    | 03050110-010              | Mill Creek       | Minor Com.  | Richland  |
| Starlite S/D Terraceway     | SC0030911    | 03050110-010              | Reeder Point Br. | Minor Com.  | Richland  |
| SC Tractor & Equip.         | SC0038024    | 03050110-010              | Reeder Point Br. | Minor Ind.  | Richland  |
| Land & Lab Tech             | ND0069761    | 03050110-010              | Sludge Injection | Minor Com.  | Unknown   |
| Creekside MHP               | SC0031143    | 03050110-020              | Congaree Creek   | Minor Com.  | Lexington |
| Pine Ridge Middle School    | SC0033430    | 03050110-020              | Congaree Creek   | Minor Com.  | Lexington |
| LCJMW&SC Old Barnwell WWTP  | SC0023680    | 03050110-020              | Red Bank Creek   | Min. Munic. | Lexington |
| LCJMW&SC Two Notch WWTP     | SC0040789    | 03050110-020              | Red Bank Creek   | Min. Munic. | Lexington |
| Glenn Village CWS, Inc.     | SC0030651    | 03050110-020              | First Creek      | Min. Com.   | Lexington |
| Lex. County Edmund Landfill | SC0045110    | 03050110-020              | Bear Creek       | Minor Ind.  | Lexington |
| Loxscreen Co.               | SC0003174    | 03050110-020              | Savana Branch    | Minor Ind.  | Lexington |
| Southern Plastics           | SC0001881    | 03050110-020              | 6 Mile Creek     | Minor Ind.  | Lexington |
| Solar Farms                 | SC0039021    | 03050110-020              | 6 Mile Creek     | Minor Ind.  | Lexington |
| SC Fire Acad.               | SC0039225    | 03050110-020              | 6 Mile Creek     | Minor Ind.  | Lexington |
| City of Cayce WTP           | SC0040924    | 03050110-020              | 6 Mile Creek     | Minor Ind.  | Lexington |
| Racetrac Service Station    | SC0044326    | 03050110-020              | 6 Mile Creek     | Minor Ind.  | Lexington |

Table 18 Continued: Discharges By County

| Facility Name                     | NPDES Number | Watershed Management Code | Receiving Stream   | Type       | Cnty      |
|-----------------------------------|--------------|---------------------------|--------------------|------------|-----------|
| Columbia Metro Airport            | SC0044322    | 03050110-020              | 6 Mile Creek       | Minor Ind. | Lexington |
| Amoco Service Station             | SC0044393    | 03050110-020              | 6 Mile Creek       | Minor Ind. | Lexington |
| Parkwood MHP                      | SC0030473    | 03050110-020              | 6 Mile Creek       | Minor Ind. | Lexington |
| Brookforest MH Est.               | SC0031178    | 03050110-020              | Dry Creek          | Minor Com. | Lexington |
| Belle Meade S/D Midland Utilities | SC0030988    | 03050110-020              | Dry Creek Trib.    | Minor Com. | Lexington |
| Lloydwood SD, CWS, Inc.           | SC0031402    | 03050110-020              | Dry Creek Trib.    | Minor Com. | Lexington |
| Anchor Continental                | SC0002101    | 03050110-030              | Gills Creek        | Minor Ind. | Richland  |
| Ridgeway Chevron                  | SC0044784    | 03050110-030              | Gills Creek        | Minor Ind. | Richland  |
| Tennaco Station #62038            | SC0046035    | 03050110-030              | Gills Creek        | Minor Ind. | Richland  |
| Amphenol Products                 | SC0046264    | 03050110-030              | Jackson Creek      | Minor Ind. | Richland  |
| Amerada Hess                      | SC0044989    | 03050110-030              | Little Jackson Cr. | Minor Ind. | Richland  |
| Fast Fare # SC-639                | SC0045594    | 03050110-030              | Little Jackson Cr. | Minor Ind. | Richland  |
| Sears #1525 Columbia Mall         | SC0044407    | 03050110-030              | Lightwood Knot Br. | Minor Ind. | Richland  |
| Pantry #470 Forest Acres          | SC0042218    | 03050110-030              | 8 Mile Branch      | Minor Ind. | Richland  |
| Tennaco Service Station           | SC0043770    | 03050110-030              | 8 Mile Branch      | Minor Ind. | Richland  |
| Textron Homelite                  | ND0072818    | 03050110-030              | Spray Irrigation   | Minor Ind. | Richland  |



Table 18 Continued: Discharges By County

| Facility Name                    | NPDES Number | Watershed Management Code | Receiving Stream  | Type        | Cnty      |
|----------------------------------|--------------|---------------------------|-------------------|-------------|-----------|
| SC Air Nat'l Guard               | SC0000701    | 03050110-050              | Cedar Creek       | Minor Ind.  | Richland  |
| US Army Ft. Jackson              | SC0003786    | 03050110-050              | Cedar Creek       | Minor Ind.  | Richland  |
| Cedar Creek MHP                  | SC0032018    | 03050110-050              | Cedar Creek       | Minor Com.  | Richland  |
| Gadsden Elem. School             | SC0031526    | 03050110-050              | Cedar Cr. Trib.   | Minor Com.  | Richland  |
| Franklin Park SD/ CWS            | SC0031399    | 03050110-050              | Cabin Branch      | Minor Com.  | Richland  |
| Hopkins Jr. High School          | SC0031500    | 03050110-050              | Cabin Br. Trib.   | Minor Com.  | Richland  |
| Hopkins Elem. School             | SC0031496    | 03050110-050              | Horsepen Branch   | Minor Com.  | Richland  |
| Square D Company                 | SC0004286    | 03050110-050              | Goose Branch      | Major Ind.  | Richland  |
| Town of Eastover WWTP            | SC0038237    | 03050110-070              | Griffins Creek    | Min. Munic. | Richland  |
| Town of Batesburg-Leesville WWTP | SC0024465    | 03030203-010              | Duncan Creek      | Mjr. Munic. | Lexington |
| Town of Batesburg-Leesville WTP  | SC0041084    | 03050203-010              | Duncan Creek      | Minor Ind.  | Lexington |
| Pellion Elem. School             | ND0013561    | 03050302-040              | Spray Irrigation  | Minor Com.  | Lexington |
| CE Taylor Pumping, Inc.          | ND0070149    | 03050203-040              | Septage Injection | Minor Ind.  | Lexington |
| Town of Swansea                  | SC0023205    | 03050203-050              | Bull Swamp        | Min. Munic. | Lexington |
| Gaston Copper Recycling          | SC0034541    | 03050203-050              | Boggy Branch      | Minor Ind.  | Lexington |

## **Treatment and System Capacity**

### **Newberry County**

While there are a number of small industrial and community systems in the basin, there are only two large public providers of sewer service. The City of Newberry has the largest system with a highly developed network capable of meeting large treatment needs. Its plant has current capacity of 3.2 MGD with flows averaging 2.10 MGD per day. The City is undertaking an upgrade and expansion to 4.8 MGD over the next ten years. Industrial and non-industrial flows are about equal.

The Newberry County Water & Sewer Authority operates three plants: Dewalt plant which serves the Town of Prosperity; Plant #2 at Camping Creek which is east of the Town of Prosperity and a small community plant at Bedford Way Subdivision. The Dewalt plant is rated at 0.651 MGD and has a average flow of 0.3 MGD. No plans are made to expand this facility. Camping Creek is rated at 0.03 MGD and is cited for eventual elimination. Bedford Way is also rated at 0.03 is expected to remain in service with no plans for expansion.

### **Lexington County**

The gradual centralization of Lexington County's wastewater treatment, transportation and collection has been and continues to be a point of discussion as smaller systems compete against larger systems for new customers. Today as in the past, there are numerous players, both public and private, in the wastewater business. The County's increasing population outside of established municipalities has led to multiple players among the public providers and they principally include the Town of Batesburg-Leesville, Town of Chapin, Town of Lexington, City of Cayce, the Lexington County Joint Municipal Water & Sewer Commission (LCJMW&SA) and the Town of Swansea.

The Town of Batesburg-Leesville operates 2.0 MGD plant with no immediate plans for expansion.

The Town of Chapin operates a 1.20 MGD plant. No plans are expected for immediate expansion.

Town of Lexington operates two plants (Whiteford and Coventry Woods) with a combined capacity of 2.25 MGD. The Town of Lexington is currently constructing a regional transportation system for the 12 & 14 Mile Creek basins with treatment forwarded to the Cayce Main Plant. Its two operating plants are to be eliminated.

The City of Cayce operates a 8.0 MGD plant. Expansions plans are expected given the increase in flow anticipated by the 12 & 14 Mile Creek system.

The LCJMW&SC operates two plants (Two Notch and Old Barnwell) which are cited for merger and eventual elimination in the Cayce Main plant. Their combined

capacity is estimated at 1.2 MGD.

Lastly, the Town of Swansea has a 0.16 MGD lagoon system with no immediate plans for expansion or consolidation.

### **Richland County**

In Richland County there are two major public treatment facilities and one smaller facility: the City of Columbia's Metro plant, the East Richland Public Service District (ERPSD) Main plant and the Town of Eastover's municipal plant. The City of Columbia's Metro plant is the region's largest and is rated at 40.0 MGD. The City is currently expanding and upgrading the plant to 60.0 MGD. It accepts flows from unincorporated portions of Richland and Lexington Counties and the City of West Columbia.

The ERPSD's Main plant is a 10.0 MGD facility. It is anticipated that an expansion to 14 MGD is planned over the next few years given the District's current rate of growth.

Richland County's Broad River plant is a 2.25 MGD facility. It has a design capacity of 15.0 MGD. Plans to expand the plant are expected.

The Town of Eastover has a small 0.025 MGD plant with no plans for expansion.

### **Existing Population and Land Use**

The 1990 basin population was 361,540 persons with a county distribution approximately: Newberry, 7.0%; Lexington, 48.0% and Richland, 45.0%. Figure 2 illustrates the current land use pattern.

#### **Newberry County**

In Newberry County the majority of the population resides in or surrounding the City of Newberry, the Town of Prosperity and along Lake Murray. The land use pattern for that portion of the County is primarily single-family residential and general commercial development in or immediately adjacent the towns with some industrial sites located in close proximity. Additional residential subdivision development is found along Lake Murray with scattered service and retail commercial activity.

#### **Lexington County**

Almost the entirety of Lexington County is found within the basin, excluding a small portion of the northeast corner near Chapin. As a whole Lexington County is a

growing suburban county with numerous small municipalities serving as commercial hubs for the surrounding residential development. Generally, the north-central (Town of Lexington) and north-east (Town of Irmo, City of Cayce and West Columbia) portions of the County are urban in character; that is with higher residential densities intermixed with commercial and industrial development. Further west and south, the County takes on a more rural and undeveloped setting. Industrial development, while historically closer to the urban areas, is now being constructed in the center of the County along I-20 south of the Town of Lexington. The interstate's proximity to utilities make it a prime location for industrial activities and is expected to continue attracting new industry.

### **Richland County**

The portion of Richland County that lies in the basin ranges in character from urban along the northern reaches near the Broad and Congaree Rivers to the rural in the southern areas or lower portion of the County. In the northern and central areas, the City of Columbia dominates the landscape with typical urban-style land uses, notably commercial uses along major highways, radiating from the central business district. In between the commercial corridors are residential uses ranging from single-family to apartment units. Once beyond the City's urban core, the developing fringe mirrors some aspects of downtown, such as the sprawling commercial development along the highways, but the residential activity changes. Apartment uses and smaller single-family housing become less obvious with larger lots and more suburban style housing blending into the neighborhoods.

Immediately beyond the developing fringe and reaching into the lower portion of the County, the landscape quickly becomes open with large wooded areas and cleared pastures. Lower Richland, while experiencing residential growth during the 1970s and early 1980s, still is largely pastoral in character as a holdover from its agricultural past. The Town of Eastover is the only incorporated municipality in the area. While Eastover has only a small population, it is the center of activity with some retail and service commercial uses. Beyond Eastover in all directions within the basin commercial and industrial uses are typically scattered among highway intersections or setback far from the road on higher, flat land. Figure 6 illustrates the current land use for basin.

### **Projected Growth**

#### **Development Trends And Land Use**

#### **Newberry County**

Development in Newberry County is expected to be modest. The majority of new commercial and industrial activity will likely be adjacent the City of Newberry along

US 76 to the Town of Prosperity with other residential growth along the reaches of Lake Murray. Utility infrastructure remains the largest single barrier to greater growth in the areas beyond the municipalities. Future industrial and commercial uses are expected along the I-26 interchanges from Little Mountain to the City of Newberry as shown in Figure 7.

### Lexington County

Lexington County will continue to be the fastest growing County in the region. The location and density of development will be very closely tied to planned infrastructure improvements in the eastern and northern portions of the fringe areas adjacent existing municipalities. Development is expected to continue along Lake Murray and expand north and east of the Towns of Lexington and Chapin. The eastward expansion of development will join the development occurring along the fringe of West Columbia to completely urbanize the area between the municipalities. More development is also expected to move west and south of the City of Cayce to encompass the communities of Edmund and Gaston.

In the rural areas, housing will continue to increase significantly, particularly in the form of manufactured housing which has been rising over the last seven years. The Towns of Batesburg-Leesville, Gilbert and Summit will likely see increased commercial development resulting from rising customer demand.

Industrial growth is expected to continue along I-20 and in the vicinity of the Metropolitan Airport, south of Cayce. This is anticipated given its poor soils for agricultural use and the eventual extension of utilities.

Sustaining agricultural uses are expected to continue in the southern portion of the County near Swansea and Pelion.

### Richland County

The northern portion of the basin reaches into the urban core of Columbia and extends into lower Richland County just beyond the Town of Eastover and northward toward Fort Jackson. While this area is expected to grow, it largely lies outside the portions of the County most likely to experience the higher rates of residential development. The Columbia urban core and fringe will continue to develop and subsequently become larger as it provides employment for an 11 county market area. The land use pattern in the core is not expected to change significantly, although new residential development is likely to return to the Congaree Vista in ever increasing amounts.

Beyond the urban core eastward and southward, development will occur from infill and redevelopment with new construction being limited to the phasing of utility extensions by the City of Columbia. Some new industrial and commercial development



will continue to be relocated along the Southeastern Beltway, but will gradually give away as available land suitably zoned becomes scarce.

Further south toward the Town of Eastover, residential development will increase but limited to large lot single-family in small subdivisions or occur in a piecemeal fashion. While this form of residential growth is slow, it will fuel increased commercial traffic in the local communities, especially in Hopkins, Gadsden and Horrell Hill. Figure 7 illustrates the projected land use pattern for area.

### Population and Employment Projections

Table 19 reflects the land use pattern shown in Figure 7, illustrating the significant growth that occurs in Lexington County and the modest changes in portions Newberry and Richland Counties. Between 1990 and 2010, the basin is projected to increase in population by 27.4%, and by 10.0% in employment.

Table 19: Population and Employment Projections

| Basin Number | 1990 Population | 1990 Dwellings | 1990 Emp. | 2015 Population | 2015 Dwellings | 2015 Emp. |
|--------------|-----------------|----------------|-----------|-----------------|----------------|-----------|
| 3050109-080  | 312             | 116            | 55        | 352             | 118            | 100       |
| 3050109-150  | 18929           | 7035           | 8028      | 21186           | 7203           | 9550      |
| 3050109-163  | 666             | 247            | 309       | 757             | 252            | 400       |
| 3050109-180  | 2655            | 983            | 1127      | 3352            | 1210           | 1391      |
| 3050109-190  | 19808           | 7470           | 4919      | 26277           | 11014          | 6357      |
| 3050109-200  | 1000            | 370            | 344       | 1397            | 504            | 428       |
| 3050109-210  | 82604           | 31011          | 38028     | 111540          | 48323          | 41357     |
| 3050110-010  | 33595           | 12917          | 25911     | 43987           | 18287          | 30473     |
| 3050110-020  | 44231           | 15578          | 14111     | 52898           | 22402          | 16059     |
| 3050110-030  | 123789          | 47779          | 64078     | 150554          | 64668          | 62897     |
| 3050110-040  | 1200            | 444            | 480       | 1410            | 509            | 564       |
| 3050110-050  | 10401           | 3358           | 3962      | 13618           | 4795           | 4658      |
| 3050110-060  | 1377            | 538            | 454       | 1575            | 706            | 519       |
| 3050110-070  | 1441            | 562            | 475       | 1648            | 739            | 543       |
| 3050203-010  | 6682            | 2475           | 2673      | 8841            | 3274           | 3536      |



Table 19 Continued: Population and Employment Projections

| Basin Number | 1990 Population | 1990 Dwellings | 1990 Emp.     | 2010 Population | 2010 Dwellings | 2010 Emp.     |
|--------------|-----------------|----------------|---------------|-----------------|----------------|---------------|
| 3050203-020  | 982             | 363            | 393           | 2030            | 733            | 812           |
| 3050203-030  | 3993            | 1479           | 1597          | 7323            | 3004           | 3329          |
| 3050203-040  | 2341            | 867            | 515           | 4317            | 1558           | 605           |
| 3050203-050  | 5182            | 1919           | 2073          | 7627            | 2753           | 3051          |
| <b>Total</b> | <b>361540</b>   | <b>135511</b>  | <b>169532</b> | <b>460668</b>   | <b>192052</b>  | <b>186629</b> |

### Needs Assessment and Projected Build-out Capacity

Examining Table 20, it is estimated that the 1990 wastewater flow generated is approximately 45.3 MGD for the basin. Of the 41.7 MGD estimated flow, current usage suggests an estimated 24.4 MGD is treated through septic tanks.

Projections for 2015 estimate a build-out flow of 56.9 MGD. Projections for septic tank use is expected to decline as a proportionate share in Lexington and Richland Counties, while remaining stable in Newberry County. Projected septic tank treatment is estimated at 22.4 MGD.

Demand for effluent treatment is expected to increase overall by 11.6 MGD, with demand for central sewer to increase 13.6 MGD over the next twenty years.

Table 20: Estimated Existing and Projected Flow

| Basin Number | 1990 Flow (t) | 1990 Dwellings | 1990 Emp. | 2015 Flow (t) | 2015 Dwellings | 2015 Emp. |
|--------------|---------------|----------------|-----------|---------------|----------------|-----------|
| 3050109-080  | 35970         | 116            | 55        | 41920         | 118            | 100       |
| 3050109-150  | 2367250       | 7035           | 8028      | 2669560       | 7203           | 9550      |
| 3050109-163  | 82930         | 247            | 309       | 96270         | 252            | 400       |
| 3050109-180  | 332660        | 983            | 1127      | 419650        | 1210           | 1391      |
| 3050109-190  | 2350450       | 7470           | 4919      | 3112200       | 11014          | 6357      |
| 3050109-200  | 121000        | 370            | 344       | 167710        | 504            | 428       |
| 3050109-210  | 10379380      | 31011          | 38028     | 13675530      | 48323          | 41357     |

Table 20 Continued: Estimated Existing And Projected Flow

| Basin Number | 1990 Flow       | 1990 Dwellings | 1990 Emp.     | 2015 Flow       | 2015 Dwellings | 2015 Emp.     |
|--------------|-----------------|----------------|---------------|-----------------|----------------|---------------|
| 3050110-010  | 4522780         | 12917          | 25911         | 5814760         | 18287          | 30473         |
| 3050110-020  | 5331060         | 15578          | 14111         | 6348730         | 22402          | 16059         |
| 3050110-030  | 15680090        | 47779          | 64078         | 18649850        | 64668          | 62897         |
| 3050110-040  | 146800          | 444            | 480           | 173420          | 509            | 564           |
| 3050110-050  | 1269970         | 3358           | 3962          | 1648120         | 4795           | 4658          |
| 3050110-060  | 165490          | 538            | 454           | 190320          | 706            | 519           |
| 3050110-070  | 173360          | 562            | 475           | 199370          | 739            | 543           |
| 3050203-010  | 836590          | 2475           | 2673          | 1105590         | 3274           | 3536          |
| 3050203-020  | 120310          | 363            | 393           | 248660          | 733            | 812           |
| 3050203-030  | 493540          | 1479           | 1597          | 915500          | 3004           | 3329          |
| 3050203-040  | 273760          | 867            | 515           | 494820          | 1558           | 605           |
| 3050203-050  | 638430          | 1919           | 2073          | 941100          | 2753           | 3051          |
| <b>Total</b> | <b>45321820</b> | <b>135511</b>  | <b>169532</b> | <b>56913080</b> | <b>192052</b>  | <b>186629</b> |

(1) Flows are measured in gallons per day

Footnote: Flow estimates were calculated on 100 gpd per capita, 10 gpd for I/I and a range of 30 to 50 gpd per employee based upon commercial or industrial use.

## **Watershed Assessment: Water Quality Issues and Standards**

### **Saluda River (3050109-080)**

#### **Description**

Toney Creek, Mountain Creek, Little Creek, and the Broadmouth Creek watershed drain into the Saluda River in the upper portion of this watershed, and further downstream Turkey Creek enters the river to form an arm of Lake Greenwood. Tributaries of the western side of Lake Greenwood include Mulberry Creek, Camp Branch, and Quarter Creek. The Reedy River watershed and the Rabon Creek watershed join to form another arm of the lake. Also flowing into the eastern lake shore are Long Lick Branch and Cane Creek. As a reach of the Saluda River, this watershed accepts the drainage of all streams entering the river upstream of the watershed. There are a total of 294 stream miles in the watershed, all classified FW.

#### **Water Quality Issues**

Saluda River - Aquatic life uses are not supported for this section of the Saluda River due to methoxychlor (a pesticide) measured in excess of the acute aquatic life criterion in 1992. This is compounded by a significantly declining trend in dissolved oxygen concentration and a significantly increasing trend in turbidity, most likely the result of nonpoint source runoff. Dibromochloromethane was detected in water 1988. Recreational uses are fully supported.

The Saluda River is included on the Section 319 list of waters impacted by agricultural activities, resulting from computer modelling of NPS problems.

### **Saluda River - (03050109-150)**

#### **Description**

This section of the Saluda River flows out of Lake Greenwood and is joined by Halfway Swamp and Sharps Branch near the Town of Chappells. Further downstream, Terrapin Creek and Mill Creek enter the river, followed by the Little River watershed, Rocky Branch, and Tosity Creek. Beaverdam Creek flows past the Town of Silverstreet and drains into the Saluda River arm of Lake Murray.

The Bush River originates near the City of Clinton where it accepts drainage from Shell Creek. Further downstream, near the City of Newberry, Rocky Creek, Big Beaverdam Creek, and Scott Creek flow into the Bush River. The Bush River then accepts drainage from Timothy Creek near the Town of Prosperity and drains into the

Saluda arm of the lake. Big Creek enters the lake just downstream of the confluence of the Saluda and Bush Rivers. There are a total of 208 stream miles in this watershed, all classified FW.

### **Water Quality Issues**

Saluda River - Recreational uses are fully supported, but aquatic life uses are only partially supported upstream and midstream while fully supported downstream. Conditions appear to be improving at midstream, although high concentrations of copper and zinc were measured in previous years upstream and downstream, respectively.

The Saluda River is also effluent limited at the discharge for Champion International (SC0022730).

The Saluda River is listed as a Section 319 impacted waterbody for NPS problems associated with agricultural activities.

Saluda River arm of Lake Murray - Eutrophication studies classify this area as a Category I for excessive nutrients and extremely high productivity. In-lake restoration for algae and macrophytes is recommended. Due to natural conditions and to the small number of samples, aquatic life uses are considered to be fully supported at all sites. Recreation uses are also fully supported.

Bush River - Monitored at three sites, aquatic life uses are fully supported at the upstream site, but may be threatened by a significantly declining trend in dissolved oxygen concentration and a significantly increasing trend in total nitrogen. Recreational uses are not supported at the upstream site due to fecal coliform bacteria excursions under FW standards; however, a significantly declining trend in the bacteria concentrations suggests improving conditions. Aquatic life uses are fully supported at the midstream and downstream sites, although a significantly increasing trend in pH was noted downstream. Recreational uses are not supported at either the midstream or downstream sites due to fecal coliform bacteria excursions under FW standards.

Bush River is water quality limited for ammonia, DO, TRC and BOD-5 at the discharge points of the City of Newberry's WWTP (SC0024490) and Newberry W&SA WWTP #2 (SC0040860).

The Bush River is also listed as a Section 319 impacted waterbody for NPS problems associated with agricultural activities.

Bush River arm of Lake Murray - Eutrophication studies classify this area as a Category I for excessive nutrients and extremely high productivity. High algal concentrations may impair swimming usage of the Bush River arm of the lake. Recreational uses are fully supported, while aquatic uses are only supported at the upstream monitoring site and are threatened at the downstream site by high

concentrations of zinc measured in 1990 and 1991. Derivatives of DDT were also detected in the sediment in 1988.

The Bush River Tributary is effluent limited at the discharge for Federal Paper Board plant (SC0036064).

### **Little River (03050109-163)**

#### **Description**

This section of Little River receives drainage from the upper Little River watershed, and together with its tributaries drains into the Saluda River near the Town of Silverstreet. Garrison Creek flows into the Little River near the top of the watershed. Further downstream, the Little River accepts drainage from Sandy Run Creek, Mechanic Creek, Mudlick Creek, Davenport Branch, and Stephens Creek. There are a total of 84.7 stream miles in this watershed, all classified FW.

#### **Water Quality Issues**

Little River - Aquatic life uses are fully supported. Significantly increasing trends in pH and turbidity were noted upstream, most likely due to nonpoint runoff. Recreational uses are not supported in the upstream area due to fecal coliform bacteria excursions under Class FW standards. Recreational life uses are considered to be fully supported at the downstream site, despite fecal coliform bacteria excursions, due to the small number of samples.

This section of Little River is included in the Section 303 high priority list of waters targeted for TMDL development in relation to elevated fecal coliform concentrations, and is listed as water impacted by agricultural activities, citing a high potential for NPS problems.

### **Clouds Creek (03050109-180)**

#### **Description**

The Clouds Creek watershed originates near the Town of Ridge Spring, and encompasses a total of 155.5 stream miles before entering the Little Saluda River. Clouds Creek is joined by Peters Creek and Indian Creek before flowing through Asbill Pond. Downstream of the pond, Clouds Creek accepts the drainage of Jacobs Branch, and Long Branch. West Creek originates near the Town of Batesburg-Leesville, and accepts the drainage of Bates Branch, Gin Branch, and Lick Creek before entering Clouds Creek at the base of the watershed. Clapboard Branch and Beaverdam Creek



enter Clouds Creek just at the base of the watershed. Clapboard Branch and Beaverdam Creek enter Clouds Creek just as it drains into the Little Saluda River.

### **Water Quality Issues**

The West Creek Tributary and Gin Branch streams are effluent limited at the discharge points of Hermitage Industries (SC0039187) and Columbia Farms (SC0041599), respectively.

### **Saluda River (03050109-190)**

#### **Description**

The Saluda River watershed and the Little Saluda River watershed merge to form the headwaters of Lake Murray. Spring Creek, Hawleek Creek, Rocky Creek, and Buffalo Creek flow into the waters of upper Lake Murray. Camping Creek and Bear Creek enter midlake on the northern shore, and the Hollow Creek watershed, Horse Creek, Little Hollow Creek, Beaverdam Creek, Rocky Creek, Beech Creek, and Twentymile Creek enter midlake on the south shore of the lake. Eighteenmile Creek drains into the lake near the dam. There are a total of 82.6 stream miles in this watershed, and Lake Murray extends over 51,000 acres.

#### **Water Quality Issues**

Lake Murray - Lake Murray was found to be nutrient limited in nitrogen as a result of testing in 1989. Eutrophication studies reclassified the lake headwaters from Category I to Category II, for an intermediate trophic condition, which may be susceptible to further degradation. The dam area is classified as a Category III for the lowest trophic condition and is recommended for preservation. Treatment for Hydrilla in selected areas of the lake began in 1993, for increasing public access. Herbicide treatment in selected areas of Lake Murray for Hydrilla was continued in 1994.

Generally, aquatic life uses are fully supported in the Lake, but may be threatened at the dam due to the high concentrations of zinc measured in 1988 and 1989. Derivatives of DDT were detected in sediment in 1988, together with a high concentration of chromium detected in 1988 and a very high concentration of chromium in 1990. Recreational uses are fully supported throughout the lake but show signs of an increasing trend in fecal coliform bacteria concentrations at four out of eight monitoring stations.

Camping Creek - Aquatic life uses are fully supported, however a significantly



increasing trend in pH was noted. Recreational uses are not supported due to fecal coliform bacteria excursions. Camping Creek is included on the Section 303 list of low priority waters which may require TMDL development in relation to fecal coliform, toxic metals, amonina and dissolved oxygen. Camping Creek is also listed on the Section 304 (I) long list for impacted waterbodies due to nontoxic pollutants.

Both Lake Murray and Camping Creek are included on the Section 319 list for impacted waters by agricultural activities. Computer modelling indicates a high potential for NPS problems from agricultural activities in the headwaters. Currently, Camping Creek is understudy for remediation for NPS activities.

Several areas are water quality limited at the following discharge points: SCPRT Dreher Is. at Lake Murray (SC0026948) for NH3-N, DO and BOD-5; Rollingwood SD at Lake Murray Tributary (SC0022845) for NH3-N, DO, TRC, BOD-5; GA Pacific at Camping Creek (SC0022641) for effluent; Newberry W&SA Plant #2 at Camping Creek (SC004471) for NH3-N, DO, TRC and BOD-5 and Mii-Dera Garden Apartments at Stevens Creek (SC0032042) for NH3-N, DO and TRC.

#### **Hollow Creek (03050109-200)**

##### **Description**

Hollow Creek accepts drainage from Caney Branch and Little Creek before draining into the middle region of Lake Murray. There are a total of 19.2 stream miles in this watershed, all classified as FW.

##### **Water Quality Issues**

Aquatic life uses are fully supported, but recreational uses are not supported due to fecal coliform bacteria excursions. Hollow Creek is included on the Section 303(d) high priority list of waters targeted for TMDL development in relation to the fecal coliform concentrations. The Creek is also on the Section 319 list.

#### **Saluda River (03050109-210)**

##### **Description**

This section of the Saluda River flows out of the Lake Murray dam and merges downstream with the Broad River to form the Congaree River in the City of Columbia. The lower Saluda River is protected under the SC Scenic Rivers Act. Rawls Creek,

Lorick Branch, and Kinley Creek drain into the Saluda River near the Town of Irmo. Juniper Creek and Long Creek join to form Twelvemile Creek near the Town of Gilbert. Twelvemile Creek accepts drainage from Hogpen Branch, Fall Branch, and Boggy Branch before flowing through the Town of Lexington to accept the drainage of Fourteenmile Creek and enter the River. Stoop Creek, Senn Branch and Double Branch enter the Saluda River just prior to its confluence with the Broad River. There are a total of 129 stream miles in this watershed, all classified FW.

### **Water Quality Issues**

**Saluda River** - There are three monitoring sites along this section of the river. Aquatic life uses are not supported at the upstream site (below the dam) due to dissolved oxygen excursions, compounded by a significantly declining trend in dissolved oxygen concentration. This is at least partly due to the release of waters low in dissolved oxygen from the bottom of Lake Murray. Recreational uses are fully supported at this site.

Aquatic life uses are not supported at the midstream site (downstream from Rawls and Lorick Branch Creeks) due to dissolved oxygen concentrations. Recreational uses are also fully supported.

Aquatic life uses may be threatened at the downstream site (near 12 Mile and Kinley Creeks) due to a very high concentration of zinc in 1991, which is compounded by a significantly increasing trend in BOD-5. Recreational uses are only partially supported due to elevated concentrations of fecal coliform bacteria.

The lower Saluda River is included on the Section 303 (d) low priority list due to dissolved oxygen concerns. A permit driven TMDL was calculated for this segment proposing an Ultimate Oxygen Demand (UOD) of 3,900 lbs/day.

The Saluda River is also listed on Section 319 list of watersheds targeted for implementation action due to agricultural activities and urban runoff.

The Saluda River is water quality limited and effluent limited at the following discharges: SCE&G Hydro (SC0002046) for effluent; Allied Fibers (SC0003557), Phillips Components (SC0003425), Woodland Hills SD (SC0029475), Bush River Utilities (SC0032743), CWS I-20 Regional (SC0035564), Friarsgate SD (SC0036137), Riverbanks Zoo (SC0037613), each for DO; Tennaco #6033 (SC0045535) for toxics (metals); EMRO #62 (SC0040321) for effluent.

**Rawls Creek** - Aquatic life uses are fully supported, but recreational uses are not supported due to fecal coliform bacteria excursions under Class FW standards. Rawls Creek and Lorick Branch are both impacted by urban runoff.

**Lorick Branch** - Aquatic life uses are fully supported, but may be threatened by a significantly declining trend in dissolved oxygen concentration. Recreational uses are not supported due to fecal coliform bacteria excursions under Class FW standards.

Lorick Branch is water quality limited for effluent at the following discharge: Phillips Components (SC0003425).

Kinley Creek - Aquatic life uses are fully supported; however, a significantly increasing trend in pH was noted together with a high concentration of zinc in 1988 water samples. Sediment samples revealed a presence of chlorodane (pesticide) and a very high concentration of zinc in 1988. Recreational uses are not supported due to fecal coliform bacteria excursions under Class FW standards. Kinley Creek is impacted by agricultural and construction activities and urban runoff.

Rawls Creek, Lorick Branch and Kinley Creek are included in Section 303 (d) high priority list of waters for TMDL development in relation to elevated fecal coliform concentrations. Kinley Creek also has elevated level of suspended solids.

Twelvemile Creek - Aquatic life uses may be threatened due to extremely high concentrations of zinc measured in 1988 and 1991, and a very high concentration of copper measured in 1988. In 1992, zinc and copper did not exceed aquatic life acute criteria. A significantly decreasing trend in pH was also noted at this site. Recreational uses are only partially supported due to fecal coliform bacteria excursions under Class FW standards.

Twelvemile Creek is water quality and effluent limited at the following discharges: Coventry Woods (SC0026735) for NH3-N, DO and TRC; Victorian Lake Estates (SC0034932) for NH3-N, DO and TRC; Fast Fare #616 (SC0045586) for BOD-5 and metals; Oak Grove Estates (SC0031201) for NH3-N, DO, TRC and BOD-5; Oak Grove Elementary (SC0026018) for NH3-N, DO, TRC and BOD-5; Carolina Steel & Wire (SC0026239) for BOD-5; Vanarsdale SD (SC0030945) for NH3-N, DO, TRC and BOD-5; and Sun Machinery (SC0046221) for BOD-5.

Twelvemile Creek is also listed on the Section 304 (I) short list for waters not expected to meet applicable water quality standards after full implementation for NPDES permit conditions due, in part or entirely, to point source discharges of Section 307(a) toxics. Twelvemile Creek is also included on the Section 304(I) long list for impacted waterbodies due to concerns for ambient toxicity.

Fourteenmile Creek is water quality limited at the following discharges: CWS/Watergate (SC0027162) for NH3-N, DO, TRC and BOD-5; Lakewood Utilities WWTP (SC0034436) for NH3-N, DO, TRC and BOD-5; and Whiteford WWTP (SC0043541) for NH3-N, DO, TRC and BOD-5.

Stoop Creek is water quality limited at the following discharge: Alpine Utilities WWTP (SC0029483) for NH3-N, DO and TRC.

Double Branch Creek is water quality limited at the following discharges: Phillips

66 (SC0041998) for BOD-5 and metals; and SCE&G Holland Street (SC0044296) for BOD-5.

## **Congaree River (03050110-010)**

### **Description**

The Congaree River originates with the confluence of the Saluda River Basin and the Broad River basin in the City of Columbia. There are a total of 290 stream miles in this watershed, all classified FW. Rocky Branch flows into the Congaree River within the City of Columbia, followed by the Congaree Creek watershed and the Gills Creek watershed. Further downstream, Toms Branch, Big Lake, and Savany Hunt Creek enter the river. The river then accepts drainage from the Sandy Run watershed and Mill Creek. Big Beaver Creek accepts drainage from Rock Branch, Branham Branch, Little Beaver Creek, and Congaree Spring Branch before flowing in the Congaree River. Butlers Gut Creek connects Big Beaver Creek to Buyck Bottom Creek and to the river. Bates Mill Creek drains into the river at the base of the watershed. Another natural resource in the watershed is the Congaree River Swamp National Monument, a wetland preserve, which extends along the northeastern river bank in the lower portion of the watershed.

### **Water Quality Issues**

Congaree River - Aquatic life uses are fully supported at the Saluda River side, but may be threatened by a significantly declining trend in dissolved oxygen concentration. A high concentration of zinc was measured in both water and sediment in 1988. Recreational uses are fully supported for this area.

Aquatic life uses are also fully supported for the Broad River side, but again may be threatened by a significantly declining trend in dissolved oxygen concentration. In 1988 toluene was detected in a water sample, and chlorodane was detected in sediment. The detection of organic chemicals at two monitoring sites is probably a result of nonpoint source runoff from the Columbia metropolitan area. Recreational uses are only partially supported in this area due to fecal coliform bacteria excursions under Class FW standards; however, a significantly declining trend in fecal coliform bacteria concentrations suggests improving conditions.

Aquatic life uses are fully supported in the downstream area. Although there were fecal coliform bacteria excursions at both sites, due to the small number of samples, recreational uses are considered to be fully supported.

The Congaree River is water quality and effluent limited for the following

discharges: Cayce Quarry (SC0001058) for effluent; Carolina Eastman (SC0001333) for effluent; Westinghouse (SC0001848) for effluent; SCE&G (SC0002062) for effluent; Columbia WWTP (SC0020940) for NH3-N, DO and TRC; Cayce WWTP (SC0024147) for NH3-N, DO and TRC; Teepak Inc. (SC0033367) for effluent; ERPSD WWTP (SC0038865) for NH3-N, DO and TRC; West Columbia Water Treatment Plant (SC0041076) for effluent; SCDaAg (SC0041386) for effluent; Atlantic Soft Drink (SC0043125) for effluent; SCE&G Coit Station (SC0044814) for effluent.

Also, the river is included on the Section 319 list of waters impacted for urban runoff.

Mill Creek - Excursions of pH have occurred; however they are consistent with the swamp-influenced waters seen in this region of the state, and as such are considered natural conditions, not standards violations. Aquatic life uses are fully supported in the upstream portion, but may be threatened by a significantly declining trend in dissolved oxygen concentration and a significantly increasing trend in turbidity. Recreational uses are not supported due to fecal coliform bacteria excursions, compounded by a significantly increasing trend in fecal coliform bacteria concentration.

Downstream, aquatic life uses are only partially supported due to dissolved oxygen excursions. A significantly increasing trend in turbidity was also evident in this portion. Recreational uses are only partially supported due to elevated fecal coliform bacteria concentrations. The increases in turbidity and fecal coliform are most likely due to nonpoint runoff, which prompted placement of Mill Creek on the Section 304 (I) long list for waters impacted by nontoxic pollutants.

Mill Creek is water quality limited for the following discharge: Charles Towne (SC0032760) for NH3-N, DO, TRC and BOD-5.

Congaree River Tributary - Congaree River tributary is water quality limited at the following discharges: Chevron USA - Cayce (SC0042455) for BOD-5 and toxics; Amerada Hess Corp #40234 (SC0044946) for BOD-5 and toxics; Amerada Hess Corp #40237 (SC0044971) for BOD-5 and toxics; and Young's Food Store (SC0045705) for BOD-5 and toxics.

Rocky Branch - Rocky Branch is water quality and effluent limited at the following discharges: Tarmac Mid-Atlantic (SC0002364) for effluent and EMRO Mktg #289 (SC0045128) for BOD-5 and Toxics.

Toms Branch - Toms Branch is water quality and effluent limited at the following discharges: Silver Lake MHP (SC0031321) for effluent and Rolling Meadows MHP (SC0033685) for NH3-N.

Savany Hunt Creek - Savany Hunt Creek is effluent limited at the following discharge: SCDOT/I-26 Rest Area.



Reeder Point Branch - The Reeder Point Branch is water quality and effluent limited at the following discharges: Starlite SD (SC0030911) for NH3-N, DO and TRC and SC Tractor & Equipment (SC0038024) for effluent.

Mill Creek is included on the Section 303(d) high priority list of waters targeted for TMDL development in relation to elevated fecal coliform concentrations. A TMDL was calculated for the Congaree River for ammonia toxicity due to its large size and close proximity of the dischargers. The TMDL for NH3-N is 8963 lbs./day.

### **Congaree Creek (03050110-020)**

#### **Description**

The Congaree Creek watershed drains into the Congaree River near the City of Cayce. West Fork and East Fork join to form Scrouter Branch, which flows through Redmond Pond and Shealy Pond to enter Congaree Creek near its origin. Congaree Creek then flows through Hunt Pond before accepting the drainage from Red Bank Creek. Second Creek flows into First Creek, which in turn drains into Congaree Creek. Congaree Creek also accepts the drainage from Savana Branch, Sixmile Creek and Dry Creek. There are a total of 189.2 stream miles in this watershed, all classified FW. Due to the absence of point source dischargers and the presence of endangered species, Scrouter Branch together with Redmond Pond and Shealy Pond may qualify as potential ORW candidates. Another natural resource in the watershed is Peachtree Rock Preserve, located at the headwaters of Hunt Branch.

#### **Water Quality Issues**

Congaree Creek - There are two monitoring sites along Congaree Creek. Excursions of pH occurred at both sites; however, they are consistent with the swamp-influenced waters seen in this region of the State, and are considered natural conditions, not standards violations. Aquatic life uses may be threatened in the upstream portion due to a very high concentration of zinc measured in 1990, compounded by significantly increasing trends in pH and turbidity. The turbidity is most likely due to nonpoint runoff. Recreational uses are only partially supported due to fecal coliform bacteria excursions under Class FW standards, compounded by a significantly increasing trend in fecal coliform concentration.

Aquatic life uses and recreational uses are fully supported downstream, despite fecal coliform bacteria excursions, due to the small number of samples.

Congaree Creek is water quality and effluent limited at the following discharges: Creekside MHP (SC0031143) for effluent and Pine Ridge Middle School (SC0033430) for NH3-N, DO, TRC and BOD-5.



Red Bank Creek - Aquatic life and recreational uses are fully supported. Excursions of pH has occurred; however, they are consistent with swamp-influenced waters seen in this region of the State, and are considered natural conditions, not standards violations. Significantly increasing trends in turbidity were noted at both upstream and downstream sites, together with a significantly increasing trend in pH in the upstream portion. The turbidity is most likely a result of nonpoint source runoff.

Red Bank Creek is included on the Section 319 list of waters impacted by agricultural and resource extraction activities, and included on the Section 304 (I) long list for waters impacted by nontoxic pollutants.

Red Bank Creek is water quality limited at the following discharges: LCJMW&SC Old Barnwell WWTP (SC0023680) for NH3-N and TRC and the Two Notch Road WWTP (SC0040789) for NH3-N and TRC.

Savana Branch - Aquatic life uses are fully supported; however, significantly increasing trends in pH and turbidity were noted. The pH excursions are consistent with the swamp-influenced waters seen in this region of the State, and as such are considered natural conditions, not standards violations. The turbidity is most likely a result of nonpoint source runoff. Recreational uses are only partially supported at this site due to fecal coliform bacteria excursions, compounded by a significantly increasing trend in the concentration of fecal coliform bacteria.

The Savana Branch is water quality limited at the following discharge: Loxscreen Company (SC0003174) for NH3-N.

Sixmile Creek - Aquatic life uses are only partially supported due to dissolved oxygen excursions. A significantly increasing trend in turbidity was noted at this site, most likely due to nonpoint source runoff. Recreational uses are fully supported.

Sixmile Creek is water quality and effluent limited at the following discharges: Southern Plastics (SC0001881) for effluent; Solar Farms (SC0039021) for TRC; SC Fire Academy (SC0039225) for effluent; Cayce Water Plant (SC0040924) for TRC; RaceTrac Service Station (SC0044326) for BOD-5 and toxics; Columbia Metro Airport (SC0044342) for effluent; Amoco Service Station (SC0044393) for BOD-5 and toxics; and Parkwood MHP (SC0030473) for NH3-N, DO, TRC and BOD-5.

First Creek is water quality limited at: CWS/Glenn Village (SC0030651) for NH3-N, DO, TRC and BOD-5.

Bear Creek is water quality limited at: Lexington County Landfill (SC0045110) for NH3-N, TRC and BOD-5.

Dry Creek is water quality limited at: Brookforest MH Estates (SC0031178) for TRC.

Dry Creek Tributary is water quality limited at the following discharges: Belle Meade SD (SC0030988) for NH3-N, DO and TRC and CWS/ Lloydwood SD (SC0031402) for NH3-N and TRC.

Lake Caroline - Aquatic uses are fully supported; however, significantly increasing trends in pH and turbidity were noted. Turbidity is most likely a result of nonpoint source runoff. Recreational uses are only partially supported at this site due to fecal coliform bacteria excursions under Class FW standards; however, a significantly declining trend in fecal coliform bacteria concentrations suggests improving conditions.

### **Gills Creek (03050110-030)**

#### **Description**

Gills Creek flows through the northeastern section of the City of Columbia and drains into the Congaree River. There are a total of 147.4 stream miles in this watershed, all classified FW. Gills Creek originates near Sesquicentennial State Park and accepts the drainage of Bynum Creek, Rowell Creek, and Mack Creek before flowing through Boyden Arbor Pond, Rockyford Lake, and Forest Lake. Jackson Creek also originates near Sesquicentennial State Park and flows through Sesquicentennial Pond and Windsor Lake before accepting the drainage of Little Jackson Creek. Jackson Creek then flows through Carys Lakes and Spring Lake to join Gills Creek in Forest Lake. Downstream of Forest Lake, Gills Creek accepts the drainage of Eightmile Branch and Pen Branch before flowing through Lake Katherine. Wildcat Creek drains into Gills Creek downstream of Lake Katherine. Gills Creek and its associated wetlands drain into the Congaree River. Due to the absence of point source dischargers and the presence of endangered species, several streams may qualify as potential ORW candidates including: Rose Creek, Bynum Creek, and the headwaters of Gills Creek.

#### **Water Quality Issues**

Gills Creek - Aquatic life uses may be threatened in the upstream portion due to high concentrations of zinc measured in 1988 and 1992, and a very high concentration of zinc measured in 1989. These are compounded by a significantly declining trend in dissolved oxygen concentration, and significantly increasing trends in pH and turbidity. Aquatic life uses are fully supported at the downstream site, however a significantly increasing trend in turbidity was noted, most likely a result of nonpoint source runoff. A sediment sample revealed the presence of organic chemicals (DDT derivative) in 1992. Although the use of DDT was banned in 1973, it is very persistent in the environment.

Recreational uses are not supported upstream or downstream due to fecal coliform bacteria excursions under Class FW standards.

Gills Creek is water quality limited at the following discharges: Anchor Continental (SC0002101) for NH<sub>3</sub>-N and TRC; Ridgeway Chevron (SC0044784) for BOD-5 and toxics and Tenneco #62038 (SC0046035) for BOD-5 and toxics.

Gills Creek and Forest Lake are both included in the Section 319 list of waters impacted by urban runoff. Data indicate on Gills Creek elevated levels of fecal coliform on numerous occasions, together with scattered elevated levels of turbidity and toxic materials (metals and organics), and excursions of DO and pH.

Jackson and Little Jackson Creeks are water quality limited at the following discharges: Amphenol Products (SC0046246) for BOD-5 and toxics; Amerada Hess #40245 for BOD-5 and toxics; and Fast Fare # 639 (SC0045594) for BOD-5 and toxics.

Lightwood Knot Branch is water quality limited at: Sears #1525 (SC0044407) for BOD-5 and toxics.

Eightmile Branch is water quality limited at the following discharges: Pantry #470 (SC0042218) for BOD-5 and toxics and Tenneco Direct Service Station (SC0043770) for BOD-5 and toxics.

Sesquicentennial Pond - The pond was stocked in 1989 with 300 grass carp, a biological control agent for aquatic plants, and sprayed with aquatic herbicides in 1990 to improve public access to the lake.

Windsor Lake - Aquatic life uses are fully supported; however a significantly increasing trend in turbidity was noted, most likely due to nonpoint source runoff. Excursions of pH occurred, however high pH levels occur naturally in lakes with significant phytoplankton communities and do not represent standards violations. Recreational uses are fully supported.

Forest Lake - Aquatic life uses may be threatened due to very high concentrations of zinc measured from 1989-1992. A significantly increasing trend in turbidity was also noted at this site. Recreational uses are fully supported, but a significantly increasing trend in fecal coliform bacteria concentrations warrants attention. Turbidity, fecal coliform, and zinc most likely result from nonpoint runoff. Forest Lake shows elevated fecal coliform levels on numerous occasions and scattered elevated turbidity and toxic material levels (metals). Forest Lake is also included on the Section 304 (I) long list for waters impacted by nontoxic pollutants.

### **Sandy Run (03050110-040)**

#### **Description**

Little Sandy Run flows into Sand Run which drains into the Congaree River. There are a total of 59.6 stream miles in this watershed, all classified FW.

#### **Water Quality Issues**

Sandy Run - Aquatic life and recreational uses are fully supported. Excursions of pH occurred; however, they are consistent with the swamp-influenced waters seen in this region of the state, and as such are considered natural conditions, not standards violations.

### **Cedar Creek (03050110-050)**

#### **Description**

The headwaters of Cedar Creek flow through Westons Pond, Harmons Pond, Morrells Pond, Clarkson Pond, and Duffies Pond before accepting the drainage of Reeves Branch and Myers Creek. After the confluence with Myers Creek, Cedar Creek flows through Wise Lake and Weston Lake and accepts drainage from Dry Branch before entering the Congaree River. The lower section of the watershed, from Wise Lake to the river, contains a large portion of the Congaree River Swamp National Monument, a wetland preserve. There are numerous recreational lake and ponds in this watershed and a total of 199.3 stream miles, all classified FW.

#### **Water Quality Issues**

Cedar Creek - Excursions of pH has occurred both in the upstream and downstream portions of the creek; however, they are consistent with the swamp-influenced waters seen in this region of the state, and as such are considered natural conditions, not standards violations. Aquatic life uses are fully supported in the upstream portion, although a significantly increasing trend in turbidity was noted, most likely a result of nonpoint source runoff. Recreational uses are only partially supported in the upstream portion due to fecal coliform bacteria excursion. Aquatic life and recreational uses are fully supported downstream.

Cedar Creek is included on the Section 319 list of waters impacted by agricultural activities and is also on the Section 304(I) long list for waters impacted by nontoxic pollutants.

Cedar Creek is water quality and effluent limited at the following discharges: SC Air National Guard (SC0000701) for effluent; US Army Fort Jackson (SC0003786) for DO and Cedar Creek MHP (SC0032018) for effluent.

Cedar Creek Tributary is water quality limited at Gadsden Elementary (SC0031526) for NH3-N, DO, TRC and BOD-5.

Cabin Branch is water quality limited at CWS/Franklin Park SD (SC0031399) for TRC.

Cabin Branch Tributary is water quality limited at Hopkins Jr. High (SC0031500) for NH3-N, DO and TRC.

Horsepen Branch is water quality limited at Hopkins Elementary for NH3-N and TRC.

Goose Branch is included on the Section 304(l) short list for waters not expected to meet applicable water quality standards after full implementation of NPDES permit conditions due, in part or entirely, to point source discharges of Section 307(a) toxics; Square D Company was the facility discharging the toxic effluent. Goose Branch is also included on the Section 304 (l) long list for impacted waterbodies due to concerns for ambient toxicity.

Goose Branch is water quality and effluent limited at: Square D (SC0004286) for BOD-5 and effluent.

## **Toms Creek (03050110-060)**

### **Description**

Toms Creek watershed contains a total of 78.9 stream miles, all classified FW. The headwaters of Toms Creek flow through Haithcock Pond and Westons pond before being joined by Ray Branch. The creek then flows through Drafts Pond and accepts drainage from McKenszie Creek before flowing into the Congaree River. Another natural resource is the Congaree River Swamp National Monunment, which extends across the lower end of the watershed.

### **Water Quality Issues**

Aquatic life and recreational uses are fully supported. Excursions of pH occurred; however, they are consistent with the swamp-influenced waters seen in this region of the state, and as such are considered natural conditions, not standards



violations. Recreational uses are considered to be fully supported, despite fecal coliform bacteria excursions, due to the small number of samples.

### **Congaree River (03050110-070)**

#### **Description**

This section of the Congaree River incorporates a total of 109.1 stream miles, all classified FW. Griffens Creek drains into Running Lake, which in turn flows through Little Lake, Big Lake, and into Running Creek. Running Creek drains into Singleton Creek, which flows through Bates Old River to reach the Congaree River. Buckhead Creek enters the river further downstream. A small portion of the Congaree River Swamp National Monument is located near the top of the watershed, where the Toms Creek watershed enters. As a reach of the Congaree River, this watershed accepts the drainage of all streams entering the river upstream of the watershed.

#### **Water Quality Issues**

Congaree River - Aquatic life uses are not supported at the site just upstream of the Wateree River confluence due to a high concentration of copper measured in 1988 and a high concentration of zinc measured in 1989. A sediment sample revealed 2,6-dinitrotoluene in 1989. Significantly, increasing trends in pH and turbidity were also noted. Recreational uses are fully supported.

A TMDL was calculated for the Congaree River for ammonia toxicity due to the large size and close proximity of the dischargers. The TMDL for ammonia is 8963 pounds/day.

This section of Congaree River has been added to the Section 319 list due to elevated levels of zinc and copper.

Griffins Creek is water quality limited at the Town of Eastover WWTP(SC038237) for NH3-N, DO, TRC and BOD-5.

### **Chinquapin Creek and Lightwood Knot Creek (03050203-010)**

#### **Description**

Chinquapin and Lightwood Knot Creeks join to form the North Fork Edisto River. Chinquapin Creek originates near the Town of Monetta and accepts drainage from Duncan Creek, Horsepen Creek, Mare Creek, Rock Creek, and Shirley Branch before merging with Lightwood Knot Creek. The Town of Batesburg-Leesville lies near the headwaters of Duncan Creek and uses a small lake associated with the drainage for its



water supply. Lightwood Knot Creek flows through several ponds including Abells Millpond and Brodie Millpond, before accepting drainage from Hellhole Creek, Marlow Creek, Thrasher Branch, Mill Creek, and Long Branch. There are a total of 101.5 stream miles and numerous small lakes in this watershed, all classified FW.

### **Water Quality Issues**

Chinquapin Creek - Aquatic life uses may be threatened at this site due to a very high concentration of zinc measured in 1988, together with a significantly declining trend in pH. Recreational uses are not supported due to fecal coliform bacteria excursions; however, a significantly declining trend in fecal coliform bacteria concentration suggests improving conditions.

Chinquapin Creek is included on the Section 319 list of waters impacted by agricultural activities. Samples show scattered levels of elevated metals. Computer modelling indicates a high potential for NPS problems from agricultural activities.

Lightwood Creek - Aquatic life uses are fully supported, but recreational uses are only partially supported due to fecal coliform bacteria excursions.

Duncan Creek - Duncan Creek is water quality limited at the discharge point for the Town of Batesburg-Leesville's WWTP (SC024465) and Water Treatment Plant (SC0041084) for NH<sub>3</sub>-N, DO and TRCs and effluent, respectively.

## **North Fork Edisto River (03050203-020)**

### **Description**

The North Fork Edisto River accepts drainage from the Chinquapin Creek and Lightwood Knot Creek watershed, Carneys Creek, Crooker Branch, and Goose Platter Creek in the upper portion of the watershed. Other tributaries that enter the river as it moves downstream include Chalk Hill Creek, Marrow Bone Swamp Creek, Wolf Pit Branch, Big Branch, Hood Branch, Rambo Branch, and Giddy Swamp Creek. There are a total of 134.0 stream miles in this watershed, all classified FW. Due to the absence of point source dischargers and the presence of endangered species, all or part of the streams in this watershed may qualify as potential ORW candidates.

### **Water Quality Issues**

North Fork Edisto River - Aquatic life uses and recreational uses are fully supported at the headwaters. Dissolved oxygen and pH excursions occurred; however, they were typical of values seen in blackwater systems and as such were considered natural conditions, not standards violations. Aquatic life uses may be threatened at the

downstream site due to a very high concentration of zinc measured in 1992. Recreational uses are fully supported, despite fecal coliform bacteria excursions, due to the small number of samples.

*A fish consumption advisory has been issued by the SCDHEC for mercury and includes the streams in this watershed.*

#### **Black Creek (03050203-030)**

##### **Description**

Black Creek originates near the Town of Gilbert and drains into the North Fork Edisto River. Black Creek flows through Taylor Pond and several other ponds before accepting the drainage of Pond Branch and flowing into Paxton Millpond. Downstream of the millpond, Little Black Creek enters Black Creek, which then flows through Clarks Millpond to accept drainage from Cedar Pond Branch, Spring Branch, Big Branch, McCartha Branch, and Coney Branch. There are a total of 80.5 stream miles in this watershed, all classified FW. Due to the absence of point source dischargers and the presence of endangered species, all or part of the streams in this watershed may qualify as potential ORW candidates.

Black Creek - Aquatic life and recreational uses are fully supported. Although pH excursions occurred, they were typical of values seen in blackwater systems and as such were considered natural conditions, not standards violations.

*A fish consumption advisory has been issued by the SCDHEC for mercury and includes the streams within this watershed.*

#### **North Fork Edisto River (03050203-040)**

##### **Description**

This section of the North Fork Edisto River accepts drainage from Cedar Creek, Jackson Creek, Hollow Creek, Pond Creek, Salem Creek, Penn Branch, and Big Beaver Creek. Further downstream, Turkey Branch enters the river. There are numerous ponds and a total of 186 stream miles in this watershed, all classified FW. Due to the absence of point source dischargers and the presence of endangered species, all or part of the streams in this watershed may qualify as potential ORW candidates. As a reach of the North Fork Edisto River, this watershed accepts the drainage of all streams entering the river upstream on the watershed.

## **Water Quality Issues**

North Fork Edisto River - Aquatic life uses are fully supported in the upstream portion, but may be threatened at the downstream portion due to a very high concentration of zinc measured in 1992. Significantly increasing trends in pH and turbidity were also noted in the upstream portion. Although pH excursions occurred, they were typical of values seen in blackwater systems and as such were considered natural conditions, not standards violations. Recreational uses are fully supported at both sites.

A permit driven TMDL was calculated for the North Fork Edisto River that proposed ammonia limits at 1250 lbs./day as a monthly average, and TRC limits at 14.6 lbs./day for a monthly average and 25.24 lbs./day for a daily maximum.

The North Fork Edisto River is also included on the Section 319 list of waters impacted by agricultural activities. Water samples collected show scattered elevated of turbidity, metals and pH excursions.

*A fish consumption advisory has been issued by SCDHEC for mercury and includes the streams within this watershed.*

## **Bull Swamp Creek (03050203-050)**

### **Description**

Bull Swamp Creek originates near the Town of Gaston and flows through the Town of Swansea before draining into the North Fork Edisto River. Bull Swamp Creek flows through Spires Pond before accepting drainage from Boggy Branch, Fourth Creek, Third Creek, Cow Branch, Gardner Branch, and Little Bull Swamp Creek. Bull Swamp Creek then flows through Etheridge Mill Pond and into the North Fork Edisto River. There are a total of 108.0 stream miles in this watershed, all classified FW.

### **Water Quality Issues**

Bull Swamp Creek - Bacterial conditions are expected to improve as new NPDES permit limits are instituted in the watershed. Although pH excursions occurred, they were typical of values seen in blackwater systems and as such were considered natural conditions, not standards violations. Aquatic life uses are not supported in the upstream portion due to dissolved oxygen excursions; however, this is a secondary monitoring site and sampling is purposely biased towards periods with potentially low dissolved oxygen concentrations. Significantly increasing trends in pH and turbidity were also noted. Recreational uses are only partially supported due to fecal coliform bacteria excursions.

Aquatic life uses are fully supported in the midstream, but significantly increasing trends in pH and turbidity were noted, and P,P'DDT was detected in the 1990 sediment sample. The use of DDT was banned in 1973, but it is very persistent in the environment. Recreational uses are fully supported. Aquatic life uses are fully supported downstream based upon macroinvertebrate community data. Recreational uses are also fully supported.

Bull Swamp Creek is included on the Section 319 list of impacted waters by agricultural and construction activity. Water samples collected show scattered elevated levels of turbidity and pesticides. Computer modelling indicates a high potential for NPS problems from agricultural and urban runoff for this stream. Bull Swamp is also included on the Section 304 list of waters impacted by nontoxic pollutants.

*A fish consumption advisory has been issued by SCDHEC for mercury and includes the streams within this watershed.*

## **Management and Policy Issues**

### **Management Agencies & Service Provision**

**General Basin Policy:** There are fifteen (15) management agencies recommended for plan implementation in the basin. Generally, each management agency and its facilities is set up to be the major provider for each area and act as an general coordinator of wastewater collection, transportation and treatment. And, while other facilities identified in the plan may currently operate independently of a management agency's facilities or their related systems, all facilities within an agency's area may be identified for eventual consolidation and elimination for water quality, public health and cost-effectiveness objectives.

#### **A. Management Agency: City of Newberry**

**Management Agency Area:** City of Newberry and surrounding area.

**General Policy:** Under sole management agency direction, the City of Newberry is to implement the provisions of the plan for the prescribed management agency area with treatment at its Bush River facility.

| <b>Facility</b> | <b>Provider</b>  | <b>Basin (s)</b> | <b>Permitted Capacity</b>  |
|-----------------|------------------|------------------|----------------------------|
| Bush River      | City of Newberry | 3050109-150 (p)  | 3.2 MGD<br>1.6 MGD Planned |

#### **B. Management Agency: Town of Chapin**

**Management Agency Area:** Town of Chapin and Northeast Lexington County

**General Policy:** Under sole management agency direction, the Town of Chapin is to implement the provisions of the plan for the prescribed management area with treatment at its Wateree Creek facility.

| <b>Facility</b> | <b>Provider</b> | <b>Basin (s)</b> | <b>Permitted Capacity</b> |
|-----------------|-----------------|------------------|---------------------------|
| Wateree Creek   | Town of Chapin  | 3050109-190 (p)  | 1.2 MGD                   |

**C. Management Agency: Newberry Water & Sewer Authority**

**Management Agency Area:** Unincorporated Newberry County, excluding area immediately adjacent the City of Newberry.

**General Policy:** Under sole management agency direction, the Newberry Water & Sewer Commission is to implement the provisions of the plan for the prescribed management area, and with the long-term objective of consolidation of its facilities into a larger regional system, separately or inconjunction, with the City of Newberry.

| Facility      | Provider | Basin (s)       | Permitted Capacity |
|---------------|----------|-----------------|--------------------|
| Dewalt        | NCW&SA   | 3050109-150 (p) | .651 MGD           |
| Camping Creek | NCW&SA   | 3050109-190     | .03 MGD            |
| Bedford Way   | NCW&SA   | 3050109-190     | .03 MGD            |

**D. Management Agency: Town of Lexington**

**Management Agency:** Central portion of Lexington County

**General Policy:** Under sole management agency direction, the Town of Lexington is to implement the provisions of the plan for the prescribed management area, while eliminating and consolidating the number of dischargers through the development of a regional wastewater transportation system with final treatment at the Cayce WWTP.

| Facility              | Provider          | Basin (s)   | Permitted Capacity |
|-----------------------|-------------------|-------------|--------------------|
| Coventry Woods<br>(1) | Town of Lexington | 3050109-210 | 1.95 MGD           |
| Whiteford (1)         | Town of Lexington | 3050109-210 | 0.15 MGD           |

(1) To Be Eliminated



**E. Management Agency: Town of Batesburg-Leesville**

**Management Agency Area:** Town of Batesburg-Leesville and adjacent area.

**General Policy:** Under sole management agency direction, the Town of Batesburg-Leesville is to implement the provisions of the plan for the prescribed management agency area with treatment at its Duncan Creek facility.

| Facility     | Provider                        | Basin (s)                  | Permitted Capacity |
|--------------|---------------------------------|----------------------------|--------------------|
| Duncan Creek | Town of Batesburg<br>-Leesville | 3050109-180<br>3010110-010 | 2.0 MGD            |

**F. Management Agency: City of Cayce**

**Management Agency Area:** Eastern Central Lexington County

**General Policy:** Under sole management agency direction, the City of Cayce is to implement the provisions of the plan for the prescribed management agency area with treatment at its Cayce Main plant.

| Facility   | Provider      | Basin (s)                  | Permitted Capacity |
|------------|---------------|----------------------------|--------------------|
| Cayce Main | City of Cayce | 3050109-020<br>3050110-010 | 8.0 MGD            |

**G. Management Agency: Lexington County Joint Municipal Water & Sewer Commission**

**Management Agency Area:** Red Bank Creek and North of Hwy 378

**General Policy:** Under sole management agency direction, the Commission can, in cooperation with others or separately, implement the provisions of the plan for the prescribed management area, such that it should eventually consolidate facilities into available regional systems with treatment at the Cayce WWTP or other approved facilities as recognized by the WQMP.

**G. Management Agency: Lexington County Joint Municipal Water & Sewer Commission Facilities**

| Facility           | Provider | Basin (s)   | Permitted Capacity |
|--------------------|----------|-------------|--------------------|
| Two Notch Road (1) | LCJMW&SC | 3050109-020 | 0.40 MGD           |
| Old Barnwell (1)   | LCJMW&SC | 3050109-020 | 0.80 MGD           |

(1) To Be Eliminated

**H. Management Agency: City of West Columbia**  
**Management Agency Area: City of West Columbia and adjacent areas**

**General Policy:** Under sole management agency direction, the City of West Columbia is to implement the provisions of the plan for the prescribed management agency area such that wastewater flow is transported to the City of Columbia Metro Plant for treatment.

| Facility       | Provider            | Basin (s)                  | Permitted Capacity |
|----------------|---------------------|----------------------------|--------------------|
| Columbia Metro | City of W. Columbia | 3050109-210<br>3050110-010 | 40.0 MGD           |

**I. Management Agency: Town of Swansea**  
**Management Agency Area: Town of Swansea and adjacent area**

**General Policy:** Under sole management agency direction, the Town of Swansea is to implement the provisions of the plan for the prescribed management agency area with treatment at its Bull Swamp facility.

| Facility   | Provider        | Basin       | Permitted Capacity |
|------------|-----------------|-------------|--------------------|
| Bull Swamp | Town of Swansea | 3050109-050 | 0.16 MGD           |

**J. Management Agency: Springdale**  
**Management Agency Area: Town of Springdale**

**General Policy:** Under sole management agency direction, the City of Springdale is to implement the provisions of the plan for the prescribed management agency area such that wastewater flow is transported to the City of Cayce Main Plant for treatment.

| Facility   | Provider           | Basin (s)   | Permitted Capacity |
|------------|--------------------|-------------|--------------------|
| Cayce Main | Town of Springdale | 3050110-010 | 8.0 MGD            |

**K. Management Agency: Lexington County**  
**Management Agency Area: Portions of Unincorporated Lexington County**

**General Policy:** Under sole management agency direction, the County of Lexington is to implement the provisions of the plan for the prescribed management agency area such that wastewater flow may be treated at an existing facility or a new facility that is recognized by the Plan.

**L. Management Agency: City of Columbia**  
**Management Agency Area: City of Columbia, portions of northwest and south-central Richland County and northeast Lexington County.**

**General Policy:** Under sole management agency direction, the City of Columbia is to implement the provisions of the plan for the prescribed management agency area with treatment at the Columbia Metro Plant.

| Facility       | Provider         | Basin (s)  | Permitted Capacity                     |
|----------------|------------------|--|--|
| Columbia Metro | City of Columbia | 3050109-190<br>3050109-210<br>3050110-010<br>3050110-030 | 40.0 MGD<br>20.0 MGD Planned Expansion |

**M. Management Agency: East Richland Public Service District (ERPSD)**  
**Management Agency Area: Portions of Northeast Richland County**

**General Policy:** Under sole management agency direction, the ERPSD is to implement the provisions of the plan for the prescribed management agency area such that wastewater flow is transported to the ERPSD Main plant for treatment.

| Facility   | Provider | Basin (s)   | Permitted Capacity |
|------------|----------|-------------|--------------------|
| ERPSD Main | ERPSD    | 3050110-030 | 10.0 MGD           |

**N. Management Agency: Richland County**  
**Management Agency Area: Unincorporated Richland County**

**General Policy:** Under sole management agency direction, Richland County is to implement the provisions of the plan for the prescribed management agency area such that the wastewater flow in the northwest portion of the County is transported to the Broad River plant for treatment.

| Facility    | Provider        | Basin (s)   | Permitted Capacity |
|-------------|-----------------|-------------|--------------------|
| Broad River | Richland County | 3050109-090 | 2.5 MGD            |

**O. Management Agency: Town of Eastover**  
**Management Agency Area: Town of Eastover**

**General Policy:** Under sole management agency direction, the Town of Eastover is to implement the provisions of the plan for the prescribed management agency area such that the wastewater flow is transported to the Town's plant.

| Facility | Provider         | Basin (s)       | Permitted Capacity |
|----------|------------------|-----------------|--------------------|
| Eastover | Town of Eastover | 3050109-060 (p) | .025 MGD           |

## Long Range Basin Planning

While the Regional 208 Water Quality Management Plan will act as the principal guide in directing actions taken by local designated management agencies, the plan also recognizes the impact of other planning efforts. For this reason, the 208 Plan attempts to blend with it related planning activities to better coordinate infrastructure needs and assist member local governments in their efforts to control the effects of growth and development on the environment.

### Lower Saluda River Corridor Plan

During the 1980s community interest in protecting the Lower Saluda River prompted the SC Water Resources Commission ( Currently SC Department of Natural Resources) to declare the river eligible for Scenic River Designation. From this step came a public effort to undertake a comprehensive resource management plan sponsored by the SC Water Resources Commission and SC Department of Parks, Recreation & Tourism.

Completed in July of 1990, the plan outlined specific recommendations addressing water quality. Reprinted from the plan and incorporated in the previous 208 Water Quality Management Plan, it states:

#### *III. Water Quality Protection*

*We recommend that the Lower Saluda Task Force support efforts to improve and protect the water quality of the lower Saluda River by addressing point and non-point pollution sources in the following manner:*

##### *A. Non-point Source Pollution*

*1. Encourage and support efforts of local governments within the Lower Saluda River Corridor to seek financial and technical assistance necessary to create, maintain and enforce comprehensive programs for sediment, erosion and stormwater runoff.*

*2. Support effective efforts to rectify existing sediment, erosion, stormwater runoff and flooding problems identified in high growth areas such as Kinley and Rawls Creek watersheds. [Non-point source pollution has caused problems in the Saluda River ranging from threats to the fishery such as trout to the aesthetic problems of turbidity. Most of the sediment problems of the Saluda come from its tributaries, particularly Rawls Creek. Other non-point source pollution problems occur where*

vegetated buffers are too thin. The Task Force strongly supports the two recommendations above as a means to better control these types of pollution problems.]

*3. Tributaries of the lower Saluda River should be protected by a vegetated buffer sufficient to control erosion, sedimentation and other water quality problems associated with runoff.*

#### *B. Point Source Pollution*

*We recommend that jurisdictions bordering the Lower Saluda River watershed begin planning for future consolidation of domestic wastewater, and amend the 208 area-wide waste treatment management plan to reflect this goal. We also recommend that all domestic wastewater discharge be eliminated from the lower Saluda River. [One of the most controversial topics in recent years concerning the lower Saluda River has been the use of the river for the disposal of domestic wastewater. The Task Force encourage long-range comprehensive planning in order to better facilitate a regional approach to the treatment and disposal of domestic wastewater. The Task Force also recommends as a future goal that domestic wastewater discharges be eliminated for the lower Saluda River.]*

*C. Support the reclassification of the lower Saluda River from Class A to Trout Waters (Put, Grow and Take).*

#### **River Alliance Corridor Plan**

The River Alliance was formed in 1993 in an effort to construct a plan that would maximize the potential of the region's river system, specifically the confluence of the Broad, Congaree and Saluda Rivers. Its planning efforts focus on three major themes:

1. revitalizing the urban core which consists of the developed lands adjacent the rivers in the City of Columbia, W. Columbia, Cayce and unincorporated Richland and Lexington Counties,

2. preserve and protect the natural character of the environment, promoting wilderness protection, buffering controls, cluster development models and natural parklands; and



3. Encourage a corridor approach to land and water related recreation, while linking historical and cultural resources into an integrated system.

In total, the plan itself is comprised of more than 150 policy and project recommendations. It will be the task of the River Alliance to implement these projects and promote the policies among the member local governments. While the development process is its formative stages, the 208 Water Quality Management Plan endorses the efforts of the River Alliance as it relates to the protection of water quality and sensitive environmental use of the regions water resources.

### **The Edisto River Basin Project**

The Edisto River Basin Project is a comprehensive, multi-year planning effort to address the natural resource issues in the basin associated with land use changes from development. The SCDNR and the National Oceanic Atmospheric Administration (NOAA) created in the project in 1988. Its goals were to create a natural resource database using current computer technology for facilitating better decisions regarding resource allocation. A second goal was to develop public policy procedures which address resource management of the basin and promote its proper stewardship by a collective management effort of local, state and federal policy-makers.

Recommendations from the project which relate to the 208 planning process highlight several key objectives: 1) infrastructure should be developed in locations sensitive to the natural resources of the basin, 2) maintenance of the natural hydrology of the basin to promote and protect the basin's biodiversity, and 3) limit and reduce the impact from nonpoint source pollution as much as possible.

*The 208 Plan accepts each of these objectives and reinforces their application basinwide in its regional planning policies.*

### **Long Range Comprehensive Land Use Planning**

#### **Newberry County**

In Newberry County zoning has not been adopted for the unincorporated area which precludes the state legal requirement for land use planning. Of the municipalities in the basin, the City of Newberry and the Town of Prosperity have zoning and the required long-range development plans. While both municipalities anticipate growth of the next twenty-five years, only the City of Newberry forecasts the need for additional infrastructure improvements relating to its wastewater

system. Specifically, the City in conformance with its land use plan calls for the extension of service immediately adjacent the City which would promote its annexation strategy. Currently, the City is also seeking to improve its wastewater plant by expanding its capacity.

Separate but related, Newberry County has undertaken an pro-active infrastructure planning effort titled the, *I-26 Corridor Utility Study, US 176 to Highway 32, Wilbur Smith & Associates, March 1996*. This study performed at the request of the Central Carolina Economic Development Alliance, examines the costs and feasibility of providing water and sewer service to all interchanges along Interstate 26. The County is currently working with the City of Newberry and the Newberry County Water & Sewer Authority to implement its recommendations, in hopes of furthering economic development opportunities.

### Lexington County

In examining the basin boundaries almost all of Lexington County lies in the basin. In response rapid growth since the 1970s, Lexington County and the majority of its municipalities have adopted some form of zoning and conduct land use planning. The County's land use planning efforts largely focus on reducing infrastructure congestion resulting from developing land use patterns. Using a combination of the conventional district style form and a modified performance base approach, the County has emphasized the use of mitigation techniques as the method for lessening the impacts of land use incompatibility. In summary, the County recognizes the gradual suburbanization of the County from the more developed eastern portion to the growing central portion and Lake Murray shore area.

The municipalities are overwhelmingly using the district style zoning approach with each jurisdictions emphasis targeting annexation strategies. Similar to many developing counties, the municipalities are becoming the hub of economic development efforts with the surrounding rural lands converting to suburban residential communities. Lexington County's land use strategy supports this pattern of development and subsequently promotes the need for extensive water and sewer networks to sustain its growth. In part, this partially explains the presence of over eight wastewater providers and numerous private systems.

### Richland County

Richland County's subarea land use plan, *Lower Richland*, is the key land use policy guide for this portion of the basin. Described in that document, the County forecasts that the area is to likely remain rural with some development in and around the Columbia urban fringe. Past development history reinforces this

view as water and sewer is limited in its availability. Despite previous efforts to improve the provision of utility services by the County, large scale demand has not materialized prompting action by the County or some other private provider.

Future land development projections suggest a continuation of this pattern. Yet, the demand of wastewater is significant as many pockets of residential and some commercial areas operate on septic tanks. It is likely that in the absence of a strong residential building trend is started, the provision of wastewater and other utilities will not as quickly forthcoming as hoped by many in Lower Richland.

## **Plan Implementation**

### **Facilities Management**

#### **1984 - 1985 Columbia Metropolitan 201/208 Water Quality Management Plan**

While this 1996 Plan represents an overall revision to the previous 1978 and 1985 efforts, the plan will continue to recognize and use as a guide the 201 facility component of the 1985 WQM Plan. In summary, the 1985 Plan identified facilities for consolidation and closure that are to be carried forward as part of this plan, but with an implementation strategy linked to this revision. Namely, that actions taken under the recommendations listed in the 1985 plan are done in the name of this 1996 revision, and that must be in conformance with the regional plan policies.

It is also important to note that while major amendments to the plan from 1985 to the present are carried forward as part of this revision, *where interpretation issues arise, the original plan amendments are subordinate to the general regional policies.*

#### **208 Plan Certificates of Conformance**

As part of a memorandum of agreement between SCDHEC and CMCOG, a review will be conducted on all activities which involve SCDHEC review and approval of Preliminary Engineering Reports, construction permits, and effluent discharge permits in the Central Midlands 208 planning area for conformance with 208 Regional Water Quality Management Plan.

Any conflicts (non-conformance) will be evaluated by CMCOG and, where appropriate, the Regional Water Quality Management Plan will be amended. No permits or approvals in conflict with the WQM Plan will be issued by SCDHEC.

#### **SC Project Notification and Review (SCPNRS)**

As provided by the SC Project Notification and Review System which implements Presidential Executive Order 12372, CMCOG is the regional clearinghouse for review of applications by State and local agencies for federal assistance.

Administered at the State level by the Grant Services Unit, Office of the Governor, the SCPNRS process provides the opportunity by appropriate state and local officials to review and comment, and be involved in efforts to obtain and use federal assistance, and to assess the relationship of proposals to their plans and programs.

All projects which are federally financed will be reviewed and provided with comment in relation to the 208 WQM Plan, where appropriate.

## **Non-Point Source Pollution Management**

Nonpoint source pollutants are generally introduced to a waterbody during a storm event and enter the system from diverse areas. Nonpoint source contributions originate from a variety of activities that include agriculture, silviculture, construction, storm water runoff, hydrologic modification, landfills, mining, and residual wastes. In fulfillment of the Clean Water Act, the State in conjunction with other federal and local agencies manage several programs which reduce the impact of nonpoint source pollution. The following is a summary explanation of the principal activities.

### **State Program Activities**

The State's NPS Management Program fulfills certain requirements of both Section 319 of the Clean Water Act Amendments of 1987, and Section 6217 of the Coastal Zone Act Reauthorization Amendments of 1990. The program comprehensively addresses NPS pollution by providing a framework for agency coordination and cooperation and a strategy for effectively implementing management measures to control NPS pollution.

Issued by USEPA, the *Guidance Specifying Management Measures for Sources of Nonpoint Pollution in Coastal Waters* is used by SCDHEC which compiles technology and management methods to control NPS. The measures focus on five major categories of nonpoint sources: 1) agricultural runoff; 2) urban runoff, 3) silvicultural runoff, 4) marinas and recreational boating; and 5) channelization and channel modification, dams and streambank and shoreline erosion. USEPA has also included management measures for wetlands, riparian areas, and vegetated treatment systems that apply generally to various categories of sources of nonpoint pollution.

South Carolina implements these recommended technology-based management methods statewide, as they are equally applicable outside of coastal watersheds.

### **Soil and Water Conservation Planning**

Within the 208 planning boundary, each county has through its local conservation district has developed long-range plans which, in part, addresses nonpoint source pollution. Listed are the objectives and strategies by County.

#### **Fairfield County**

In the areas of erosion, sediment control, stormwater water management and water quality, the objective is to reduce off-site sediment to land and water resources and improve water quality of ground and surface waters of Fairfield County. Specific steps include:

1. review all submitted sediment and erosion control plans for adequacy of measures to reduce erosion and retain sediment on development sites,
2. assist the county by recommending measures to control erosion and sediment on construction sites,
3. encourage the municipality of Winnsboro to enforce its erosion control ordinance,
4. report to the county council, on an annual basis, the status of the erosion and sediment control ordinance,
5. cooperate with SCDNR and other state agencies in implementing a nonpoint source management program for agriculture, urban, stormwater runoff, construction, and mining under the CWA, and
6. cooperate with local, state and federal agencies in identifying water quality problems areas.

#### Newberry County

The Newberry County Soil and Water Conservation District has adopted several strategies addressing nonpoint pollution:

1. initiate programs and provide technical assistance for landusers to implement and maintain conservation systems that will reduce the rate of erosion to tolerable levels, including providing public information, conduct monitoring of Food Security Act plans and develop individual property-owner conservation plans,
2. reduce the impact of nonpoint pollution in urban and built-up areas by providing plan review and local sediment control ordinances, assist landusers in identifying soil and water resource problems, sponsoring informational seminars and cooperating with local, state and federal agencies on nonpoint source issues, and
3. to identify and provide technical assistance to treat point and nonpoint sources of pollution, primarily sediment and animal waste through assisting livestock producers in developing animal waste management plans, and completing the objectives in the Bush River-Camping Creek Water Quality Project Plan.



## Lexington County

Conservation resource concerns and objectives identified by the Lexington County Soil and Water Conservation District which directly relate to nonpoint source pollution include: cropland erosion; sediment, erosion and stormwater management and water quality.

Specifically, the District would like to reduce the percentage of land eroding from 42% to 25% by increasing contour farming, increasing acreage of grass waterway and terracing, and increase conservation tillage.

In the area of urban erosion and sedimentation, the district continues to carry several services such as reviewing plans addressing sediment and erosion, working with the Sediment Control Advisory Council to assess county needs, providing education materials, assisting directly with flood prevention projects, and seek funding for technical assistance.

Lastly, water quality issues are a high priority as the District also seeks to reduce runoff and sediment in the rivers and streams, improving overall water quality. The District currently works with SCDHEC in administering nonpoint source programs.

## Richland County

In Richland County, the Soil and Water Conservation District has identified a number of resource concerns specifically relating to nonpoint issues: soil erosion, water quality, agricultural waste, flooding and provision of water and sewer.

The District has set as a goal to reduce the percentage of land eroding from 37.0% to 20.0%, by preparing conservation plans, increasing conservation techniques such as contour farming, terracing, conservation tillage and field stripping. Other efforts include education and local technical assistance to developers.

For water quality concerns, the goals focus on reducing runoff and sediment by improving sediment control discharge locations and working with SCDHEC on identifying problems areas.

In the area of agricultural waste the District provides management alternatives for land application of waste, contact land owners and offer technical assistance in soils and proper waste discharge and coordinate with state regulatory agencies on current regulations and procedures.

Lastly, the District also encourages the expansion of water and sewer throughout the County as certain soil types have restrictions for septic tanks due to soil texture and flooding; shallow wells produce low water quantity and can contain pollutants.

## **County Program Efforts**

As of the adoption of the 1978 Areawide Water Quality Management Plan, programmatic efforts to reduce nonpoint pollution were generally confined to the adoption of soil and erosion control and storm drainage ordinances. CMCOG first prepared model ordinances of each and began promoting their adoption by the regions local governments.

The objective of this effort is not to reduce sediment loss to zero, but prevent serious problems which could be expected to occur in the absence of sound management practices. Since 1985, most local governments have adopted the ordinances, including the major potential areas of urbanizing Richland and Lexington Counties.

## **Financing Options**

Historically, the CWA outlined a grant funding mechanism to finance the development of wastewater facilities identified through the 208 planning process; however, in 1988 Congress modified this financing strategy and converted the program from direct grants to a loan program. This programmatic change formed the basis of the State Water Pollution Control Revolving Loan Fund (SRF).

### **State Water Pollution Control Revolving Loan Fund**

In response to federal legislative action, South Carolina established a Revolving Loan Fund (RLF) for wastewater treatment purposes, which was authorized by the Federal Water Pollution Control Act (PL-100-4). SCDHEC administers the technical and programmatic portions of the program, while the SC Budget and Control Board makes the loans and manages the funds. Eligible applicants include counties, municipalities and special purpose districts which are involved with wastewater treatment. Eligible activities include wastewater treatment plants, interceptors, system upgrades, and collector systems. Loan terms are for below market fixed rate financing for up to 20 years at 100% of reasonable costs of the project. Generally, all projects must be identified on a priority list to be eligible for the loan.

### **SC Infrastructure Revolving Loan Fund**

The SC Infrastructure Facilities Authority Act created the SC Infrastructure Facilities Authority for the purpose of providing communities with various types of financial assistance required for environmental facilities that are necessary for both

protection of the environment and economic expansion. The Act also created the SC Infrastructure Revolving Loan Fund (SIRF) as a vehicle for the Authority to offer affordable financing for such facilities. The SIRF is a state funded and administered revolving loan fund for the construction of water and sewer facilities that is not connected with any federal program or requirements.

Initial capitalization of the SIRF is eight (8.0) million dollars and available on a first come, first serve basis. The maximum loan is two (2) million dollars and has no minimum loan threshold. Municipalities, counties and special purpose districts are eligible.

The SIRF will provide loans only for cost effective projects in viable systems that address the construction of, or improvements to, publicly owned facilities for drinking water supply, treatment and distribution; and sanitary wastewater treatment, collection and disposal, but only when such a project is not technically or financially eligible for the State Water Pollution Control Revolving Loan Fund (SRF), or that no funds are available in the SRF.

### **SC Community Development Block Grant (CDBG) Program**

Administered through the SC Department of Commerce, this grant program is open to cities and counties only. It addresses improvement to public facilities or housing while meeting one of the following objectives: 1) improve, preserve or develop areas of a community in which the population is predominately low to moderate income (LMI), 2) improve community services to a predominately low to moderate income population and 3) alleviate documented threats to the public health or welfare of the community.

The program is designed to give maximum priority to activities which will benefit low and moderate income persons. The State defines low to moderate income as 80% or less of the median family income for the project area. Each public facility must be designed to provide a minimum of 51% benefit to LMI persons. Economic development projects funded under this program must result in the creation of jobs, with at least 51% of the jobs created filled by persons who are low to moderate income.

### **USDA - Rural Development Administration**

Grants, loans or combinations of financing are available to local governments that are considered rural (populations of less than 10,000) and predominately low to moderate income. The applicable interest rate for loans is based upon a community's median family income. Grants to supplement loans are available for up to 75% of costs if the area to be served meets income requirements and if monthly rates meet or exceed rates for other comparable systems.

## **State Budget and Control Board - Division of Local Government**

Grants are available to local governments as supplemental funding for projects which contain other sources of funds. This office also administers the Revolving Loan Fund (RLF).

## **US Economic Development Administration (EDA)**

Funds are available for infrastructure projects related to economic development purposes. Grants of up to 50% of project costs are available for public works and development facilities that create or retain permanent private sector jobs. The amount of funding for a project depends on the number of jobs involved.

## **Palmetto Economic Development Corporation (PEDCO)**

The PEDCO is a private, non-profit corporation representing fifteen of the state's twenty electric cooperatives and Santee Cooper and administers the Santee Cooper Economic Development Investment Fund, which provides loans and grants for industrial/commercial development purposes. Assistance is available to areas served by cooperatives, and is partially funded by the sponsoring cooperative. Grants are available for infrastructure improvements for new or expanding businesses. Technical assistance grants are available for engineering studies.

## REFERENCES

1. Bolich, Robert W. (1994). Shoreline Management Planning: A Strategy for TVA's Marginal Strip Property. Unpublished master's thesis, The University of Tennessee, Knoxville.
2. Central Midlands Regional Planning Council (1984). Land Resources Management Plan for the Year 2005, Unpublished report, Columbia, SC.
3. Denver Regional Council of Governments (1991). Clean Water Plan, Volumes I and II, Unpublished report, Denver, CO.
4. Ellerbe, C.M. (1974). South Carolina Soils and Their Interpretations for Selected Uses, S.C. Land Resources Conservation Commission, Columbia, SC.
5. Garcia, Margot (1992). "Wetlands Protection: A Planning Perspective", Environmental Planning Quarterly, (9) 2:7-10.
6. Just v. Marinette County (1972) 201 N.W. 2d 761.
7. Marshall, William D. (1993). Assessing Change in the Edisto River Basin: An Ecological Characterization, South Carolina Water Resources Commission, Report No. 177, Columbia, SC.
8. New York State Department of Environmental Conservation (1986). Stream Corridor Management: A Basic Reference Manual, Bureau of Water Quality, Albany, NY.
9. South Branch Watershed Association, et. al., "Municipal Stormwater Management", Lebanon, NJ. (n.d.)
10. South Carolina Department of Health and Environmental Control (1987). Land Application of Sludge Guidance Manual, Unpublished booklet, Columbia, SC.
11. South Carolina Department of Health and Environmental Control (1994). A General Guide to Environmental Permitting in South Carolina, Columbia, SC.
12. South Carolina Department of Health and Environmental Control (1996). Statewide Water Quality Assessment, FY 1992-1993: A Report to Congress Pursuant to Section 305 (b) of the Federal Water Quality Act, Columbia, SC.

13. South Carolina Department of Health and Environmental Control (1994). Wellhead Protection Program. Technical Guidance Document for South Carolina: Local Groundwater Protection, unpublished document, Columbia, SC.
14. South Carolina Department of Natural Resources (1994). The South Carolina Catawba River Corridor Plan, a report of the Catawba River Task Force, Report No. 2, Columbia, SC.
15. South Carolina Water Resources Commission (1983). South Carolina State Water Assessment, Report No. 140, Columbia, SC.
16. United States Army Corps of Engineers (1985). "Regulatory Program: Applicant Information", Pamphlet No. EP 1145-2-1, Charleston, SC.
17. United States Environmental Protection Agency (1994). Biosolids Recycling: Beneficial Technology for a Better Environment, EPA Report 832-R-94-009, Washington, DC.
18. United States v. Riverside Bayview Homes, Inc. (1985) 474 U.S. 121, 133-34.
19. United States Code of Federal Regulations (1992). Title 40 Section 130 - Water Quality Planning and Management.
20. Witten, Jon, and Scott Horsley (1995). A Guide to Wellhead Protection, American Planning Association, Planning Advisory Service, Report Number 457/458, Chicago, IL.



1. The first part of the document is a title page. It contains the title of the document, the author's name, and the date of the document. The title is "The History of the United States of America". The author is "John Adams". The date is "1776".

## APPENDIX

Existing Land Use - Central Midlands Region

Future Land Use - Central Midlands Region



## Glossary

1. Water Quality Management Plan - refers to the plan required by Section 208 of the Clean Water Act and CFR 40 Part 130.
2. The Clean Water Act - (Public Law 92-500) In 1972, Congress passed the Federal Water Pollution Control Act. Its purpose is to "restore and maintain the chemical, physical, and biological integrity of the Nation's waters." P.L. 92-500 was amended in 1977 and 1987. The 1987 law is referred to as the "Clean Water Act" and is the law under which the water quality management program is operated.
3. Central Midlands Regional Planning Council - the administrative agency for water quality management planning in the Central Midlands planning area.
4. South Carolina Department of Health and Environmental Control - the state-level planning and coordinating agency for water quality management planning.
5. Non-Point Source - NPS is an unconfined area from which pollutants are washed into a body of water. Examples of NPS are agricultural run-off, urban run-off, and sedimentation from construction sites.
6. National Pollutant Discharge Elimination System - allows the EPA or the SCDHEC to require and issue a permit for the discharge of any pollutant or combination of pollutants into a lake or stream. Under NPDES, a discharge must be controlled according to Public Law 92-500 and its time requirements for pollution abatement.
7. Section 201 - Refers to a section of the Clean Water Act requiring a "facility plan" (wastewater plant/system engineering and design plans) to be prepared before any EPA wastewater facility construction grants or loans could be issued to an applicant. Because the EPA no longer offers grant monies, this requirement is not enforced. However, if a jurisdiction seeks loan money from the State Revolving Loan Fund (a Federal financing substitute for grant money), it must prepare a 201 plan as supporting documentation for the loan.
8. Section 208 - refers to the section of Public Law 92-500 that provides for the development and implementation of Water Quality Management Plans.
9. Central Midlands planning area - the area encompassing Fairfield, Lexington, Newberry, and Richland Counties, South Carolina.

10. mg/l or milligrams per liter - unit of measurement for expressing concentrations of pollutants such as suspended solids, biological oxygen demand, or dissolved oxygen.
11. Designated Management Agency - Term used to describe those agencies selected by the governor and EPA to carry out the provisions of the water quality management plan.
12. Designated Management Agency Area - A defined area where the Designated Management Agency has responsibility for implementing the water quality management plan.
13. Dissolved Oxygen (DO) - The concentration of oxygen dissolved in water. Adequate oxygen levels are necessary to maintain biological metabolism, aquatic life, and a balanced biotic community. Insufficient dissolved oxygen concentration may result in fish kills, anaerobic decomposition of organic material, and subsequent production of noxious gasses and floating sludge. These undesirable conditions adversely impact recreational water use.
14. Biochemical Oxygen Demand (BOD) - The amount of oxygen consumed by aerobic biological processes in the decomposition of organic material.
15. Nutrients - All substances essential for the maintenance, growth, and reproduction of living organisms. Two of the most important nutrients affecting aquatic biological systems are phosphorus and nitrogen. Phosphorus is a major component of living cells and is essential to respiration and photosynthesis. Nitrogen is important for bacterial decomposition of organic matter. These nutrients are normally present in limited quantities and restrict biological productivity. However, when present in large amounts, nutrients increase aquatic plant and algal growth and accelerate eutrophication, the natural aging process of water bodies. At advanced stages of eutrophication decomposing organic material and elevated respiration rates deplete dissolved oxygen in the water resulting in fish kills and other noxious conditions indicative of poor water quality. Many nutrients enter surface waters from natural sources; however, man's domestic, agricultural, and industrial activities often directly or indirectly contribute excessive amounts.
16. Sludge, or biosolids - Any solid, semi-solid, or liquid residue generated from a municipal, private domestic (including septage), commercial, industrial, or water supply treatment plant which is not approved as part of point source discharge.