

SEWER SERVICES IN THE UPSTATE: MEETING THE CHALLENGE

A 20-Year Plan from the Upstate Roundtable
November 1994

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EXECUTIVE SUMMARY

The single most important factor that limits the continued growth and economic development of the Upstate is the capacity to treat wastewater. The current capacity of 64 million gallons per day can barely satisfy present needs, yet demand is projected to nearly double in just 20 years. The problem is aggravated by the fact that the Upstate is a "headwaters region" where the flow in our rivers and streams is relatively small. The Upstate Roundtable was formed to develop a 20-year plan for meeting this challenge.

This plan focuses on the need for a regional approach to wastewater treatment planning in the five Upstate counties drained by the Saluda, Reedy and Enoree Rivers. The counties include Anderson, Greenville, Laurens, Pickens and Spartanburg.

The plan provides an inventory of current assets—facilities now in operation and their current and available capacities—and it projects future growth in each of the three basins in terms of development, wastewater flow and potential locations for new regional treatment facilities. These facilities play a major role in the plan, which forecasts the need for seven facilities to be constructed, six current plants to be upgraded, and 12 older plants to be consolidated or closed.

The proposed system would handle anticipated increases in wastewater flow of 150, 50 and 125 percent, respectively, in the Saluda, Reedy and Enoree River Basins. By the year 2015, an estimated capacity of 124 million gallons per day will be needed to serve the three basins. The cost to build the plants and trunk lines to handle that volume is projected at \$362 million (in 1994 dollars).

The plan reviews a variety of issues that affect wastewater treatment capacity. These issues are divided into three broad categories: capacity, management and planning.

Several strategies should be adopted to optimize future capacity. For example, existing treatment capacity can be increased by implementing water conservation programs and recovering unused capacity allotted to industrial customers. Sewer capacity can be increased by solving infiltration and inflow problems; river capacity can be optimized by locating mid-size regional treatment plants at specific points on the rivers. The plan also examines strategies associated with the need to change metals limitations, control nonpoint sources of pollution, and improve river modeling techniques. Additionally, alternatives must be found for wastewater treatment discharges during low-flow conditions. These include alternate effluent uses, land application, reuse, effluent diversion to larger bodies of water, controlled effluent releases based on river flow, and alternate water quality standards for specific river segments.

To govern river capacity for the region as a whole, the plan recommends that a basin manager oversee each of the three basins. This manager would deal with issues such as coordination of entities providing service, controlling nonpoint sources of pollution, and establishing intergovernmental agreements for the sharing of services.

Common programs are needed for the management of sludge disposal as well as programs to control septage and oil and grease entering the sewer system.

The successful financing of a regional wastewater treatment system depends on interagency cooperation and the coordination of resources. A variety of potential alternative capital financing services are available, including commercial banks, the State Revolving Loan Fund, traditional general obligation and revenue bond financing, and joint ventures with counties and local sewer providers. Since market and investor preferences change over time, each of these alternatives should be examined to determine the most cost-effective financing vehicle available as specific projects are undertaken.

The plan calls for agencies to work together to explore the feasibility of federal funding for construction. The concept of an access fee should be explored as a potential source of additional revenue to help defray construction costs. Furthermore, an interagency development fund should be established to finance specific projects after all other avenues of funding have been exhausted.

The Upstate has a long history of self-reliance in meeting challenges. The demand for providing modern, cost-effective infrastructure is vital to the continuing success of the Upstate. Only through regional cooperation and coordination can this challenge be met successfully.

I. INTRODUCTION

A. BACKGROUND

Residents of the Upstate of South Carolina are privileged to live in one of the nation's most beautiful areas. We enjoy an outstanding quality of life, supported by a stable and prosperous economy. Accordingly, we have an obligation to plan and act responsibly so that our children and grandchildren may enjoy the same good fortune.

A healthy economy depends upon adequate infrastructure—that network of roads, airports, natural gas pipelines, and electrical and communications systems that foster growth. The Upstate must ensure that its infrastructure is well maintained and expanded when necessary. Almost two years ago, key professional and community leaders from Anderson, Greenville, Laurens, Pickens and Spartanburg Counties met to establish the Upstate Roundtable. Its purpose was to study a critical element in the infrastructure—sewer systems—and to develop a vision for system growth over the next two decades.

The group adopted the following mission statement: “By July 1, 1994, a 20-year plan will be formulated to ensure that adequate sewer infrastructure is in place to provide for growth and development in the area served by the Reedy, Saluda and Enoree River Basins.”

To achieve its mission, the group established five major objectives:

- To conduct an inventory of current assets, including projects which are in the active planning stage, and assess those factors which impact the full utilization of those assets. This inventory will consist of roads, water, sewer, electrical, gas and telephone services.*
- To provide a coordinated forecast of sewer infrastructure needs over the next 20 years and develop a plan for meeting these needs efficiently and economically.
- To identify the resources—human, physical and financial—which will be required to implement the long-range plan.
- To educate the community on the necessity for implementing the long-range plan and to promote and encourage active cooperation among all essential entities, both governmental and private.

*As a first step, the Roundtable decided to focus on sewer services.

- To focus special efforts on planning for the construction of regional sewer facilities in the Saluda, Reedy and Enoree River Basins.

The work of the Roundtable was carried out by four committees: Technical, Policy and Issues, Finance, and Communications. The Technical Committee was charged with conducting the inventory of the current infrastructure, providing the forecast of sewer capacity, and developing the plan for meeting capacity needs. The Policy and Issues Committee defined the issues that have a direct bearing on wastewater treatment capacities, issues such as optimal use of capacity and managing resources available in the three river basins. The Finance Committee developed alternative methods of financing the construction and operating costs of facilities recommended by the Roundtable. It reviewed a variety of financing methods, including impact fees, grants and loans, bonded indebtedness, intergovernmental participation and system privatization. The Communications Committee determined how to educate the community on the necessity for implementing the long-range plan and to encourage participation and cooperation among governmental and private entities.

Additional community, business and governmental leaders as well as technical experts agreed to join the Roundtable, and they participated in the work of one or more committees. They have prepared a comprehensive plan which, when implemented, will provide adequate sewer services to meet the area's future needs. It will eventually become part of the Appalachian Regional Development Plan, which is being formulated under the guidance of the Appalachian Regional Council of Governments and the South Carolina Department of Commerce.

Moreover, this plan is the culmination of a lot of long hours, hard work and careful thought by some of the best minds in the five-county area. But more important, it is a map which will guide current and future leaders as they determine sewer infrastructure priorities that will help the Upstate grow and prosper.

B. UPSTATE ROUNDTABLE MEMBERS

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S. Pickens Anderson
Greenville, SC

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Greenville Water System

H. Jerry Balding
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Scott Banks
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Sam Cargill
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Howard W. Covington
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C. COMMITTEES

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Curt Dillard

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II. INVENTORY OF CURRENT ASSETS

CURRENT PUBLICLY-OWNED WASTEWATER TREATMENT PLANTS IN SALUDA, REEDY AND ENOREE RIVER BASINS

Basin	Plant	County	Provider	Current Capacity	Available Capacity ¹	
Saluda	Marietta	Greenville	WCRSA ²	0.7	MGD ³	A
	Saluda	Greenville	WCRSA	0.5		B
	Parker	Greenville	WCRSA	0.2		B
	Easley/Georges Creek	Pickens	Combined Utility System	0.8		B
	Lakeside	Greenville	WCRSA	0.7		B
	Easley/Middle Branch	Anderson	Combined Utility System	2.5		A
	Piedmont	Anderson	WCRSA	0.6		A
	West Pelzer	Anderson	West Pelzer	0.2		C
	Pelzer	Anderson	Pelzer	0.2		B
	Grove Creek	Greenville	WCRSA	2.0		A
	Williamston	Anderson	Williamston	1.5		B
	Belton	Anderson	Belton	<u>2.7</u>		A
			12.6			
Reedy	Mauldin Road	Greenville	WCRSA	29.0	MGD	B
	Lower Reedy	Greenville	WCRSA	<u>5.0</u>		C
				34.0		
Enoree	Taylors	Greenville	WCRSA	4.0	MGD	B
	Pelham	Greenville	WCRSA	6.0		C
	Gilder Creek	Greenville	WCRSA	4.0		A
	Durbin Creek	Laurens	WCRSA	3.3		B
	Woodruff	Spartanburg	Woodruff	<u>0.4</u>		A
			17.7			

¹ A = Available Capacity
B = Limited Capacity
C = No Capacity

²WCRSA = Western Carolina Regional Sewer Authority

³MGD = Millions of Gallons Per Day

III. PROJECTED GROWTH IN THE THREE BASINS

A. SALUDA RIVER BASIN

1. Future Development

Significant growth is projected along both sides of the Saluda from SC Highway 183 to Williamston. The western sector of the Southern Connector, coupled with the availability of prime property at I-85 interchanges and highway improvements on US 25 and SC 20, will spur industrial and commercial growth. South of Williamston, growth will occur in Anderson County in the vicinity of Belton, Honea Path and Ware Shoals.

2. Flow Projections

Current estimates of wastewater flow for the year 2015, based on projected population and industrial growth, are approximately 32 million gallons per day (MGD) of total wastewater for the basin. Flow projected by watershed drainage areas into various segments of the Saluda River are indicated below in MGD:

<u>River Segment</u>	<u>Projected 2015 Wastewater Flows</u>
Headwaters to SC 183	0.7 MGD
SC 183 to Georges Creek	6
Georges Creek to Brushy Creek	13
Brushy Creek to Grove Creek	4
Grove Creek to Mountain Creek	<u>8</u>
	31.7 MGD

3. Potential Locations

Potential locations for regional plants include the vicinity of the mouth of each of the following: Georges Creek, Brushy Creek, Grove Creek and Mountain Creek. The most likely trunk sewer locations are along the above tributaries and the Saluda River. This would allow wastewater from the local collector sewers to flow by gravity to the proposed treatment plants.

B. REEDY RIVER BASIN

1. Future Development

The Southern Connector corridor will spur industrial and commercial growth and will facilitate Donaldson Center's growth. In addition, widening of US 25 to the south will increase commercial and industrial growth along its length into Laurens

County. Similar increases will occur along I-385 in both the Reedy and Enoree Basins. Greenville County's zoning boundary will extend southward to SC 418, thus promoting the growth of medium-density residential development. South of SC 418, rural residential areas with homes on septic tank systems will be common. Medium-density residential areas will expand along the Reedy in Laurens County as it approaches the confluence with the Saluda. Treatment may be needed to protect Lake Greenwood. Clinton, Joanna and Newberry will see growth along the Bush River, which discharges into the Saluda downstream of Lake Greenwood. That part of Laurens bordering Rabon Creek will continue to grow significantly.

2. Flow Projections

Wastewater from the drainage areas served by the existing Mauldin Road Plant will increase from 29 MGD to approximately 37 MGD. Half the increase will occur due to growth with the balance attributed to sewer rehabilitation. Lower Reedy Plant flows will increase by 5 MGD resulting from growth related to the Southern Connector and I-385. By the year 2015, growth below the Lower Reedy drainage area should generate an additional 6 MGD of wastewater. Flow projected by watershed drainage areas into various segments of the Reedy River are indicated below in MGD:

<u>River Segment</u>	<u>Projected 2015 Wastewater Flows</u>
Headwaters to Mauldin Road	37 MGD
Mauldin Road to New Harrison Bridge Road	10
New Harrison Bridge Road to Huff Creek	<u>6</u>
	53 MGD

3. Locations

Potential locations for treatment plants include the existing Mauldin Road and Lower Reedy Plant sites as well as a new site at the mouth of Huff Creek. Potential trunk sewer expansions or developments include the restoration of the Lower Reedy Plant trunk sewers, completion of the Mauldin Road basin trunk sewers, and a new Huff Creek trunk sewer to the future plant location.

C. ENOREE RIVER BASIN

1. Future Development

The GSP Airport expansion, BMW and the highway improvements in the area around BMW's plant will stimulate continued industrial growth between SC 101,

SC 417, the river and SC 14. Medium-density residential areas will continue to develop on both sides of the river from Greer to the confluence of Durbin Creek and the Enoree River. Future industrial development will be the norm along I-385 within the Enoree watershed to the area south of Clinton. Woodruff in Spartanburg County will experience industrial, commercial and residential growth.

2. Flow Projections

An estimated 22 MGD of additional flow will be generated in the basin in the next 20 years. An estimated 17 MGD of capacity will have to be added to some combination of the Taylors, Pelham and Gilder Creek wastewater treatment plants due to the growth in their watershed area. In the area below the existing Durbin Creek Plant and including the Woodruff/Laurens County service areas, 5 MGD will be needed. Flow projected by watershed drainage areas into various segments of the Enoree River are indicated below in MGD:

<u>River Segment</u>	<u>Projected 2015 Wastewater Flows</u>
Headwaters to Brushy Creek Road	8 MGD
Brushy Creek Road to SC 14	13
SC 14 to SC 146	8
SC 146 to Dildine Creek	2
Upper Durbin Creek	5
Dildine Creek to Sumter National Forest	<u>3</u>
	39 MGD

3. Locations

Potential locations for regional treatment facilities include the existing Taylors, Pelham, Gilder and Durbin Creek plant sites. Future new locations include the vicinity of the mouth of Dildine Creek and a location in Laurens County near the confluence of Duncan Creek and the Enoree River. Potential trunk sewer lines will be constructed along Princess Creek, Peters Creek, Abner Creek, Gilder Creek and Rocky Creek.

D. REGIONAL FACILITIES

1. Large vs. Mid-Size Plants

Large treatment plants (50 or more MGD) can treat wastewater as well as small to mid-size (2 to under 50 MGD) plants. However, compared to a mid-size plant, a large plant discharges a proportionally large amount of contaminants into the

receiving stream. If the receiving stream is small, as is the case in the Upstate, the large plant can cause a noticeable oxygen depletion, whereas a mid-size plant at the same location may have no noticeable effect.

Recommendation

- (1) Future planning should not be based on the concept of one large regional wastewater treatment complex.

2. Locating Regional Plants

The effluent from a treatment plant consumes a specific amount of the oxygen in a river regardless of where along the length of the river it is discharged. If a choice is possible, it is most desirable to discharge treated wastewater at a location where there is an increase in oxygen and assimilative capacity. Such a condition generally exists immediately downstream from the confluence of a tributary and a river. This is where the environmental capacity of a stretch of any river is the greatest.

Recommendation

- (2) Locate mid-size regional treatment plants on rivers just below major tributaries to maximize the assimilative capacity of the stream.

3. Extending the Life of Older Plants

Age does not necessarily warrant shutting down a treatment plant. An effective maintenance program can double or triple the useful life of a facility. Skilled operators and maintenance personnel generally know how to avoid equipment abuse and misuse, thus extending its life. Some plants 20 to 40 years old possess the process technology to remove most of the pollutants by which standards are measured today. Often these facilities were located to minimize visibility, provide isolation and promote gravity flow from most parts of the service area. If open land is also available on or adjacent to the site, then such a facility is ideal for expansion.

Recommendation

- (3) Upgrade into mid-size regional facilities older plants that are well-maintained and well-sited, particularly if open land is available.

E. FUTURE FLOW RATES AND COSTS

In the next 20 years, wastewater flow rates in the Saluda, Reedy and Enoree Rivers are projected to increase by 150 percent, 50 percent and 125 percent, respectively. Population projections and land use planning undertaken by the county and regional planning agencies, recent engineering studies on the river basins, and focus group sessions were used to project wastewater flows for the three river basins. Table 1 summarizes projected wastewater flow rates for each basin.

Table 1
Projected Wastewater Flow Rates in MGD

<u>Basin</u>	<u>Current</u>	<u>Year 2005</u>	<u>Year 2015</u>
Saluda	13	16	32
Reedy	34	47	53
Enoree	<u>17</u>	<u>25</u>	<u>39</u>
Total	64	88	124

Maps 1, 2, and 3 depict the growth in service area that will generate the projected flow rates. By the year 2015, an estimated capacity of 124 MGD will be needed to serve the three basins. The cost to build the plants and trunk lines to handle that volume is \$362 million (1994 dollars). The estimated costs for land, trunk sewers and treatment plants are summarized by basin in Table 2.

Table 2
Year 2015 Needs
Projected Costs in Millions of Dollars (1994)

<u>Basin</u>	<u>Land</u>	<u>Trunk Sewers</u>	<u>Treatment Plants</u>	<u>Total</u>
Saluda	\$2	\$53	\$109	\$164
Reedy	1	19	58	78
Enoree	<u>4</u>	<u>40</u>	<u>76</u>	<u>120</u>
	\$7	\$112	\$243	\$362 ¹

Based on the flow projections and the condition of the existing plants listed in Table 3 (see page 19), 12 of the 18 should be consolidated or closed down during

¹ This total does not include projected expenses for the rehabilitation of trunk sewers.

the planning period. Table 3 projects when the transition is likely to occur. It also indicates when regional plants will be brought on line. Furthermore, the small package treatment plants in Greenville County (not included in the table due to their small size), each treating less than 50,000 gallons per day, should be phased out by connecting their respective lines to a regional plant.

Recommendation

- (4) Consolidate older plants, upgrade well-sited plants into regional facilities and build regional treatment plants on the schedule indicated in Table 3.

Table 3
PROJECTED PUBLICLY-OWNED WASTEWATER TREATMENT
PLANTS AND CAPACITIES THROUGH YEAR 2015

<u>Basin</u>	<u>Plant</u>	<u>Current</u>	<u>Capacity in MGD</u>	
			<u>2005</u>	<u>2015</u>
Saluda	Marietta	0.7	0.7	0.7
	Saluda	0.5	C ¹	C
	Parker	0.2	C	C
	Easley/Georges Creek	0.8	C	C
	Saluda/Georges Creek	P ²	6	6
	Lakeside	0.7	C	C
	Easley/Middle Branch	2.5	C	C
	Piedmont	0.6	C	C
	West Pelzer	0.2	C	C
	Pelzer	0.2	C	C
	Saluda/Brushy Creek	P	5	13
	Grove Creek	2.0	C	C
	Williamston	1.5	C	C
	Saluda/Grove Creek	P	2	4
	Belton	2.7	2.7	C
	Saluda/Mountain Creek	P	P	8
		<hr/>		
		12.6	16.4	31.7
Reedy	Mauldin Road	29	37	37
	Lower Reedy	5	7	10
	Huff Creek	P	3	6
		<hr/>		
		34	47	53
Enoree	Taylors	4	6	8
	Pelham	6	8	13
	Gilder Creek	4	5	8
	Durbin Creek	3	4	5
	Woodruff	0.7	0.7	C
	Enoree/Dildine	P	P	2
	Lower Enoree	P	2	3
		<hr/>		
		18	26	39
TOTAL:		65*	89*	124*

¹ C = Consolidated/Closed

² P = Planned

Totals rounded off for planning purposes

IV. OPTIMAL USE OF CAPACITY

A. EXISTING TREATMENT PLANT CAPACITY

1. Recovering unused capacity allotted to industrial customers

Historically, wastewater treatment plant capacity has been permitted on a "first-come" basis with no time restrictions stipulated. Consequently, large users, such as industries and developers, have substantial permitted capacity in excess of their actual use. This results in a loss of capacity and revenue to the service provider.

For example, the Mauldin Road Plant has approximately 5 MGD of capacity which is tied up in industrial permits but which is not being used by those industries. Hence there is a loss of capacity that cannot be allocated to other users.

The South Carolina Department of Health and Environmental Control (DHEC) requires that planning for the expansion of treatment plants must be undertaken when permitted capacity reaches 80 percent of design capacity and further, that construction must begin when permitted capacity reaches 90 percent of design capacity. This requirement ensures that capacity is available for future growth. The present situation regarding industrial permits may unnecessarily trigger expansion.

Recommendations

- (5) Upstate sewer utilities should continue their current policy of allocating capacity on a first-come, first-served basis.
- (6) Permitted capacity for existing industrial users should be based on actual average discharge with provisions for short-term peak flows.
- (7) Existing users should pay an access/reservation fee if they desire to reserve capacity beyond that permitted. The reservation fee should be based on fixed costs plus debt service cost.

2. Water conservation

Water is an essential, but limited, natural resource. The cost of providing safe drinking water is rising steadily because of increasingly stringent governmental regulations.

Some Upstate areas have an ample supply of water with reserves adequate to meet projected needs for the next 20 years or more. Other areas are not so fortunate and must make serious efforts to secure sufficient water to meet their current and future needs.

The Comprehensive National Energy Act of 1992 requires new construction to include water-saving devices. This law governs the maximum amount of water that runs through a building or residential plumbing system. For example, any faucet or shower head manufactured or sold after January 1, 1994, must have a maximum flow of 2.5 gallons of water per minute, less than half of what current devices furnish. The law restricts the flow of water in new toilets to 1.6 gallons per flush, compared to 3.5 gallons in older models.

In addition to the law, economic forces will come into play. The increasing costs of water and sewer service will likely motivate consumers to reduce their usage. Water conservation will result in a reduced demand for wastewater treatment capacity. There are many approaches that individuals and companies can take to reduce water consumption.

Recommendation

- (8) The providers of water and wastewater treatment services should develop and implement a program to educate the community on water conservation issues.

B. SEWER CAPACITY

Many of the sewer lines within the three basins are old and deteriorating. Some were constructed as early as 1927. Over the years these lines have cracked in places or their pipe joints have loosened.

During heavy rains, water enters the sewer lines through these cracks, loose joints or manholes, overloading the lines and causing them to back up and overflow from the manholes. This increase in water is called infiltration and inflow (I & I). It places a heavy burden on wastewater treatment capacity. For example, the peak load on the Mauldin Road Plant can reach 160 MGD during a rain event, compared to a normal flow of 25 MGD.

Subdistricts in the Upstate have initiated a major sewer system improvement project to alleviate the current I & I problem. The total anticipated cost of this state-required project for Mauldin Road Plant trunk sewers will be approximately \$35 million to \$40 million over the next 5 to 10 years. Other municipalities in the region also have serious I & I problems which must be addressed within the near future.

Recommendations

- (9) A comprehensive and continuing program of maintenance and rehabilitation of sewer lines must be carried on throughout the area.
- (10) Separate storage basins should be constructed at wastewater treatment plants to collect excess flows during storm events. The basin contents can then be managed at controlled rates.

C. RIVER CAPACITY

The capacity of a river to accept treated wastewater is limited by the flow in the river during drought conditions. Specifically, the federal government has based water quality standards on the low seven-day flow every 10 years. This is typically referred to as the 7Q10 flow. National water quality goals call for rivers to be "fishable and swimmable" during these low-flow conditions. This is of particular concern in the Upstate because of its naturally small, low-flow streams. For example, the 7Q10 flow for the Reedy River above the Mauldin Road Plant is 10 MGD. The Mauldin Road Plant itself currently discharges 25 MGD into the river. The 7Q10 flow in the river determines not only the treatment levels required at the Mauldin Road Plant, but also whether the river can handle any additional wastewater discharges.

The Roundtable supports these national water quality goals and suggests the following strategies for optimizing river capacity.

1. Size and location of treatment plants

The Roundtable's Technical Committee has found that multiple mid-size regional plants will better utilize capacity to handle wastewater requirement loads than one extremely large regional plant. This strategy is also consistent with the need to satisfy the requirements of multiple government jurisdictions along the river.

Recommendation

- (11) The Roundtable supports the concept of multiple mid-size regional treatment plants along Upstate rivers to optimize the use of river capacity.

2. Relief from governmental standards which appear to be non-cost effective

The Roundtable is committed to the protection and enhancement of water quality in the Upstate. It also recognizes that environmental laws and regulations play an essential role in

maintaining water quality. At the same time, however, regulations that require extensive treatment without any corresponding benefit to water quality make little sense. That problem confronts wastewater treatment facilities in the Upstate with respect to limitations on the discharges of both metals (principally copper) and phosphorus. Each is discussed below.

a. Realistic metals limitations

Wastewater treatment providers should seek relief from DHEC where permit limits less stringent than those based on strict application of EPA's national criteria will not impair water quality of the receiving streams.

For several years, the U.S. Environmental Protection Agency (EPA) has published water quality criteria for metals and other so-called "toxic pollutants." These criteria, based primarily on laboratory tests, are designed to determine what concentration of a specific pollutant is safe for certain highly sensitive species of aquatic life. In some instances, these criteria are appropriate and have been used by states as standards to ensure the protection of aquatic life. However, since the criteria are laboratory derived, they do not account for the vast variety of "real-world" stream conditions, the bio-availability of particular pollutants, or site-specific aquatic communities.

Most states, including South Carolina, have incorporated the EPA criteria into their own water quality standards as mandated by the 1987 amendments to the Clean Water Act. These states are using the criteria to develop specific National Pollutant Discharge Elimination System (NPDES) permit limits on waste dischargers. In many instances, the lack of resources necessary to develop state-specific standards or the necessity of meeting the statutory deadline for adoption caused states to embrace the EPA criteria as state standards. Not unexpectedly, these states, including South Carolina, are now experiencing problems in implementing the EPA criteria in NPDES permits, especially for metals. This problem is nationwide.

Water quality standards consist of two basic components: a designated use of a water body and a set of criteria specifying the maximum concentration of pollutants that may be present in the water without impairing its suitability for the designated use. In South Carolina, the water quality standards may be found in DHEC Regulations No. 61-68 and No. 61-69.

The three rivers into which the Upstate's treatment facilities discharge (the Reedy, Enoree and Saluda Rivers) are classified as "freshwaters" in Regulation 61-68F(3). "Freshwaters" are defined in the regulation as those waters: "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 flora and fauna. Suitable also for industrial and agricultural uses."

The standards for "freshwaters" include minimum concentrations for dissolved oxygen, a range for pH, and maximum concentrations for fecal coliform. In addition, the standards incorporate by reference the national criteria established by EPA for certain toxic pollutants, including 10 metals.

A federal court decision recently explained the significance of water quality standards: "Of course, the water quality standards by themselves have no effect on pollution; the rubber hits the road when the state-created standards are used as the basis for specific effluent limitations in NPDES permits." American Paper Institute v. EPA, 36 Env't. Rep. Cases (BNA) 2025, 2027 (D.C. Cir. 1993).

In WCRSA's case, for example, the rubber has already hit the road. DHEC is applying the national criteria to establish specific effluent limitations in the various NPDES permits for the treatment plants. For example, the maximum in-stream concentration allowed under the national criteria for copper is 12 parts per billion. WCRSA anticipates that DHEC will impose that same number as the maximum amount of copper that can be discharged from its treatment facilities. Yet the drinking water standard for copper is 1,000 parts per billion. [40 C.F.R. 143.3 (1992) (secondary maximum contaminant level).] Thus, if a 12 parts per billion limit of copper is imposed, WCRSA will have to achieve a level of treatment that will be over 80 times cleaner than that required for drinking water. And, of course, the cost of that treatment is substantial. In fact, some experts question whether it is even technologically feasible to reduce copper to such low levels.

Why are stream standards so much more stringent than drinking water standards? EPA established the national criteria on the basis of protecting the most sensitive species of aquatic life in a stream. Humans are more tolerant of substances like copper than these species. The Roundtable does not suggest that these species should not be protected or that they should not continue to serve as the basis for the establishment of the national criteria.

The Roundtable does believe, however, that these national criteria often fail to take into account site-specific factors and circumstances, such as where natural conditions at a particular stream preclude the existence of the species on which the national criteria are based or where, in another stream, the species is thriving despite concentrations in excess of the national standard.

The DHEC regulation recognizes this problem and provides a means for obtaining alternate permit limits: "Site-specific permit effluent limits and alternate criteria less stringent than those derived in accordance with (the national criteria) may be derived where it is demonstrated that such limits and criteria will maintain classified and existing uses, adequate opportunity for public participation in such derivation process has occurred, and the effluent will not cause criteria for human health to be exceeded." DHEC Reg. 61-68 (E) (7) (b) (3).

The regulation does not define how a permit holder demonstrates "that such limits and criteria will maintain classified and existing uses." In practice, however, DHEC typically

requires an extensive study in the immediate vicinity of the discharge point. In many cases, these studies are duplicative of studies that have already been conducted at other locations on the same stream or on similar streams.

Recommendations

- (12) Sewer utilities in the Upstate should seek relief from DHEC in those cases where permit limits less stringent than those based on strict application of the national criteria will not impair the existing and classified uses of receiving streams.
- (13) Relief under DHEC's site-specific regulation should not be conditioned upon conducting extensive studies in the immediate vicinity of the plant discharge where data at other points on the same or similar streams support the conclusion that relief should be granted.

b. Improved nutrient modeling regarding phosphorus limits

In December of 1988, WCRSA completed construction of major improvements to its Mauldin Road Plant to meet NPDES permit limits on discharges of phosphorous. The total cost of the project was \$16 million.

These phosphorous limits were imposed primarily as the result of an effort by DHEC to reduce nutrient levels in Lake Greenwood, which is located approximately 50 miles downstream from the Mauldin Road Plant. Using a questionable nutrient loading model, DHEC determined in the early 1980s that 57 percent of all phosphorous discharged to Lake Greenwood was contributed by the Reedy River, and the Mauldin Road Plant accounted for 85 percent of the Reedy's share.

Accordingly, DHEC established permit limits for phosphorous of 314 pounds per day (monthly average). DHEC is now seriously considering the establishment of even more stringent phosphorous limits in the Mauldin Road Plant's permit. If such limits are imposed, another multimillion dollar upgrade will probably be required. Again, the permit limits under consideration are based primarily on the predictions of DHEC's nutrient model for Lake Greenwood.

The Roundtable recognizes the importance and value of water quality modeling. The reliability of the Lake Greenwood model, however, is in serious doubt. The phosphorous removal system has successfully operated at the Mauldin Road Plant for over four years.

Each day the plant receives approximately 1,500 pounds of phosphorous, but after treatment the effluent contains an average of only 168 pounds—a removal rate of nearly 90 percent. Thus, one would expect, and indeed the model predicted, a major improvement in the condition of Lake Greenwood. But this has not occurred.

This fact raises several important questions. Does the model overstate nutrient contributions by wastewater treatment facilities in the Saluda and Reedy River basins to Lake Greenwood? What are the nutrient contributions by nonpoint sources in the watershed? A 100-pound bag of fertilizer typically contains 5 to 10 pounds of phosphorous. How much fertilizer is used in the basin?

Recommendation

- (14) Through the cooperative efforts of DHEC, Upstate sewer utilities and water quality experts, an improved nutrient model for Lake Greenwood should be developed, and additional studies should be carried out to assess the impact of other point and nonpoint sources in the lake's watershed before more stringent phosphorous limits are imposed on treatment facilities in the Reedy and Saluda River basins.

3. Consolidation of small, inefficient treatment facilities

Throughout the three watersheds are numerous small, inefficient and outmoded treatment facilities for treating domestic wastewater. These are typically package plants or wastewater treatment lagoons built to accommodate small developments. As larger, state-of-the-art treatment facilities are constructed and brought on line, these smaller facilities should be required, as a condition of their discharge permits, to tie into the new regional plants.

Recommendation

- (15) As a condition for reissuance of their NPDES permits, smaller, inefficient and outdated domestic wastewater treatment facilities should be required to connect to regional plants.

4. Alternate strategies for increasing capacity

Several alternate strategies are potentially available to sewer entities that would not only maintain water quality and better utilize the capacity of the small streams, but would also allow facilities to expand for future growth. These strategies include:

- Alternate effluent uses, including land application and reuse, especially during low-flow conditions
- Effluent outfall diversions to larger bodies of water
- Increased levels of treatment
- Controlled effluent releases based on river flow

Alternate water quality standards for specific river segments

- Appropriate locations for new plants and plant expansions

In the past, it was customary for an entity to select the alternative which was least costly at the time. However, experience has shown that this solution may not be the best overall long-term plan.

The strategies selected will depend on the specific stretch of river, the specific treatment plant and the specific nearby opportunities for beneficial water reuse. The evaluation of these alternative strategies can be termed a "Best Management Practices" (BMP) Plan. The BMP recognizes that all dischargers on a stream must work collectively as a team to consider the needs of the region as a whole. The BMP should examine ways to optimize the capacity of the rivers and the treatment plants.

Recommendations

- (16) Each treatment plant within the region should evaluate alternate strategies for treatment and discharge.
- (17) The individual plant strategies should be evaluated together in a Best Management Practices Plan, which not only optimizes the capacity of individual treatment plants, but also considers the needs of the entire basin.

D. CONTROL OF NONPOINT SOURCES

Numerous studies have identified nonpoint sources as a major factor in deteriorating river quality. Nonpoint sources include not only urban stormwater runoff, but also runoff from construction sites, agricultural land, golf courses and other sources. Stormwater management has been the responsibility of various government agencies whose programs are not necessarily coordinated. Runoff from industrial facilities is DHEC's responsibility. Application and control of pesticides is regulated under the Federal Insecticide, Fungicide and Rodenticide Act (FIFRA) and administered by the Department of Agriculture and EPA. Runoff from urban areas is typically managed by the county. Recently a new governmental entity has been formed among Greenville County and the seven cities within Greenville County to monitor and manage stormwater.

Recommendation

- (18) The Basin Manager for each of the three basins should work closely with the various stormwater management entities to ensure protection and best use of the rivers. (The "Basin Manager" concept is described in Section V, A.)

E. MANAGEMENT OF OTHER WASTES

In addition to the effluent discharged from wastewater treatment plants, other by-products must be handled and disposed of in compliance with all applicable governmental regulations. These by-products should be managed basinwide when it is feasible and cost effective to do so.

1. Regional biosolids management program

Biosolids (treated sludges) are the by-product of municipal wastewater treatment. They contain nitrogen, phosphorous and alkaline materials with some humus or mulchlike material and thus show great promise as a fertilizer or soil supplement. The Federal 503 Regulations provide and encourage options other than the historical disposal of this by-product in landfills. Due to the large volume of biosolids generated and the tighter restrictions placed on landfills, Upstate utilities should jointly look at recycling opportunities to effectively reduce the volume of biosolids going to landfills. Such options should be operational in all weather conditions.

Recommendations

- (19) Upstate sewer providers should be actively researching alternative approaches to treating and handling biosolids; moreover, these efforts should focus primarily on alternatives which emphasize recycling and reuse. Such alternatives might include land application, composting, recycling, and ground cover for landfills.
- (20) At least two alternatives should be available to control the entire biosolids flow. This will provide Upstate sewer utilities a choice: if one biosolids disposal alternative—for example, landfilling or incineration—should encounter regulatory problems, then another approach—land application of lime-treated biosolids—would be permitted and ready to go.
- (21) Sewer providers that handle biosolids should encourage demonstration and development projects, particularly those aimed toward regional or basin biosolids management projects.

2. Oil and grease

Oil and grease are a constant problem for sewer utilities. Commercial and industrial operations that place oil and grease or similar by-products in sewer lines can cause line backup, overflows and equipment failures. Pretreatment permits limit the amount of industrial oil and grease, but other commercial sources are unregulated. In many cases these by-products are recyclable. A program for requiring the installation of and the ongoing cleaning and inspection of grease traps should be implemented. This program should be self-supporting and funded through a fee schedule.

Recommendations

- (22) A policy should be implemented which would:
- prohibit direct discharge of nonindustrial sources of heavy oils and grease into sewer lines
 - require the installation and regular cleaning of grease traps wherever excessive grease is produced
 - establish fees to cover the cost of inspection and disposal.
- (23) Regional sewer authorities should consider privatizing the handling and disposal of oil and grease.

3. Septage

Many areas of the Upstate, especially residential sections, have sewer collector lines available. However, these lines were installed after the homes were built and consequently, many of the homes are still on septic tanks. Other developments were built adjacent to sewers, but the developers chose to install septic tanks anyway. To improve service, reduce health risks and decrease the long-range cost of providing service, homeowners should be required to connect if sewer is in the general vicinity of the development. In remote areas septic tanks are appropriate, and local sewer providers should develop a plan and a means to accept septage at a fee that recovers the provider's actual costs.

Recommendations

- (24) Upstate sewer utilities, local planning agencies and other regulatory entities should require all septic tank users to connect to collector lines when and where they are available.
- (25) Local sewer authorities should accept septage from areas where local sewer service is not available. The costs of this service should reflect the capital and operating costs of providing the service.

V. MANAGEMENT OF RESOURCES

A. BASIN MANAGEMENT

It is widely agreed that our water resources are best managed and protected through a basin or watershed approach. Political boundaries, however, rarely coincide with river basins. The three rivers discussed in this report flow through five counties, seven municipalities and nine special service districts. Greenville County's eastern boundary (with Spartanburg County) is the Enoree River; its western boundary (with Anderson and Pickens Counties) is the Saluda. Each governmental entity exercises authority within its particular jurisdiction, but there is no overall sense of what is best for the entire three-river basin. In Charleston, for example, one governmental agency sought a permit to construct a 20-MGD wastewater treatment plant, when there was already a 40-MGD plant operated by another agency in the same basin.

Section 208 of the Clean Water Act addresses this problem. It calls for the establishment of "area wide wastewater treatment management" plans to direct the development of treatment facilities in river basins, the modification of existing facilities and the control of nonpoint sources. No NPDES permit can be issued unless it is consistent with the approved 208 Water Quality Management Plan.

In the Upstate, the Appalachian Council of Governments (ACOG) is designated by DHEC as the 208 areawide water quality planning agency. The exception is Laurens County where DHEC serves as the planning agency. Water Quality Management Plans for the Reedy, Saluda and Enoree Basins were developed by ACOG in 1978. Due to a lack of federal funding, the plans have not been significantly updated or revised since then.

The strength of these plans lies in their summaries of the locations and impacts of existing point and nonpoint sources in the basins. However, future basin growth should play the dominant role in the plans as they are revised.

The cornerstone of a revised Water Quality Management Plan would be a "Basin Management Authority" for each river basin. This Management Authority would be delegated the responsibility by the ACOG to undertake the painstaking, but essential, analysis of all point sources and nonpoint sources in the river basin and to develop reasonable means of controlling them. The Basin Manager would also allocate river capacity, identify service areas, assign responsibilities for individual utilities to build plants, and facilitate intergovernmental agreements as appropriate. Not the least of the Basin Manager's responsibilities would be recommending proposed revisions in the Water Quality Management Plan on how best to meet future wastewater treatment needs in the basin. Meaningful plans would provide both ACOG and DHEC reasons to deny permits that were not consistent with Basin needs.

Recommendations

- (26) A Basin Manager should be established for each of the three river basins. It should play the lead role in Section 208 coordination.
- (27) The Basin Manager should be a single entity consisting of the major stakeholders in each basin. The Saluda Basin management entity should consist of a representative from each of the following: Anderson County, Pickens County, the Laurens County Water and Sewer Commission (LCWSC) and WCRSA. The Enoree River Basin Manager should consist of a representative from each of the following: Greer Commission of Public Works, Spartanburg County, LCWSC and WCRSA. The Reedy River Basin would be managed by WCRSA and LCWSC. Each basin manager would have an advisory council composed of a representative from each publicly-owned treatment works within that basin. ACOG would act as a mediator to forge a consensus in situations where conflicts may exist. In this manner, plans will be developed in the interest of the region as a whole.

B. COORDINATION OF ENTITIES PROVIDING WASTEWATER TREATMENT SERVICES

At the time of the adoption of the Home Rule amendments to the South Carolina Constitution, the electors of the state of South Carolina voted in favor of permitting counties, municipalities and other political subdivisions to join together in constructing and operating public utility systems. The pertinent provision of Section 13 of Article VIII of the Constitution reads as follows:

"Any county, incorporated municipality, or other political subdivision may agree with the State or with any other political subdivision for the joint administration of any function and exercise of powers in the sharing of the costs thereof. "

During the 1992 session of the General Assembly, Act No. 319 was adopted which provides in its first paragraph as follows:

"Any county, incorporated municipality, special purpose district, or other political subdivision may provide for joint administration of any function and exercise of powers as authorized by Section 13 of Article VIII of the South Carolina Constitution."

Thus, both the provisions of Section 13 of Article VIII of the South Carolina Constitution duly adopted in 1973 and the provisions of Act No. 319 adopted by the General Assembly during the 1992 session authorize the political subdivisions of the state of South Carolina to

join together in providing the services and functions each is individually authorized to provide.

In accordance with the above quoted provisions of the South Carolina Constitution and the South Carolina Code, numerous areas in South Carolina are receiving water and sewer services as a result of joint efforts of several political subdivisions. One example is the Bull Creek Water Treatment Plant jointly constructed by the Grand Strand Water and Sewer Authority with the City of Conway and the Town of Surfside Beach. Another example is the joint construction of a water treatment plant by the Lancaster County Water and Sewer Authority and Union County, North Carolina. Each of these projects was constructed and is presently being operated pursuant to the terms of an intergovernmental contract between/and/or among the various participants.

Due to the ever-increasing urbanization of South Carolina and the resulting need for expanded utility services, many political subdivisions are looking to share the complex administration of such services and the increased costs of providing such services with others in the various areas. The Roundtable endorses efforts by various political subdivisions which seek to develop solutions on a regional basis. It believes that political climates that foster cooperation, open communication and less competition among all utility providers should be actively pursued so that at all planning stages regional solutions are explored. During such planning stages, the following factors should be considered in determining whether a project should be jointly or individually constructed and operated:

- The control of the operation, use and expansion of the facility
- The cost of the project and the financial feasibility of raising the necessary monies
- The benefits to each of the participants of constructing a regional facility
- The division of the cost of construction and operation and the benefits to each participant.

Recommendations

- (28) Future capacity may require construction of wastewater treatment facilities by multigovernmental entities. The construction and operating costs should be divided among the entities based on capacity requirements.
- (29) To determine the size of a new facility, each entity must decide the amount of capacity needed to meet its projected growth over the next 20 years, coupled with its ability to pay for that capacity.
- (30) If future needs exceed the initial allocation of capacity to a particular entity, that entity may buy capacity from another participant at replacement cost, or participate in the cost of a plant expansion.

- (31) The cost of upgrades resulting from state, federal or other regulatory requirements will be shared by all users and entities on an allocated capacity basis.
- (32) Variable operations and maintenance costs will be charged to the user. Fixed costs should be charged to users and to those holding capacity commitments.

C. INTERGOVERNMENTAL AGREEMENTS AMONG PROVIDERS

The most practical way to achieve common goals and common ends is for regional utilities and the subdistricts within their boundaries to enter into intergovernmental agreements. These agreements would leave the responsibilities and liabilities in place with the local districts but would gain the benefit of a united approach to common problems.

For example, one of the most serious problems facing regional sewer utilities is the infiltration and inflow (I & I) of rainwater and other extraneous water into the collection lines owned and maintained by their various subdistricts. (See "I & I," Section IV, B)

Upstate sewer providers are participating in a cooperative effort to address the I & I problem. The subdistricts are willingly cooperating in a coordinated program to address the issue. Intergovernmental agreements setting forth the responsibilities of each political subdivision ensure that all affected entities undertake the necessary steps to solve the problem.

Often, the consolidation of political subdivisions having common goals and ends is suggested as a solution by those who study problems in providing utility services. However, it is important to note that each is a separate and sovereign political unit, with separate revenue sources to defray the cost of the operation and maintenance of its facilities as well as the cost of the necessary improvements for the repair and expansion of these facilities. The funding for each unit varies from ad valorem taxes to tap fees and service charges. The indebtedness and legal structure of each is different. The future responsibilities of such entities are not the same. Some systems are virtually built out and have little room for expansion, while newer ones may have tremendous capital needs. Within its respective boundaries, each has the power to determine when and how its facilities will be expanded. Each is responsible for the billing and collection of its services. Other differences require more study.

A major concern is that many of the facilities owned by these entities will have to be replaced or extensively repaired, and in some instances, relocated. Some facilities are older than others. Some have been well maintained while some may require a great amount of deferred maintenance.

Also, there are legal barriers to consolidation. There is no legal statute under which a governmental agency may force another entity to turn over its facilities. Since the passage

of the Home Rule Act, the General Assembly no longer has jurisdiction over local affairs and does not have the power or jurisdiction to adopt an act which would bring about a consolidation of particular systems. In 1974, the General Assembly passed Act No. 926, which provides a procedure whereby a county council may merge special purpose districts under certain circumstances. Furthermore, the Constitution and statutory enactments specifically provide a savings provision permitting local governmental units to continue to function in the same manner as they did prior to Home Rule unless a change is made in a general law passed by the General Assembly. One of the statutes clearly states that the Home Rule Act is not to be construed as authorization to hand any of the functions of these separate political units to county councils. In addition, county councils have no authority to provide water or sewer services unless approving referenda are held.

Thus, for effective consolidations to be achieved, generally the consent and approval of the governing boards of each of the political units must be obtained. Other prohibitions, some statutory, inhibit the transfer of facilities from these political subdivisions to another. In some instances a referendum may be required, and with others, a condition of a bond issue may prevent the transfer of the assets until the bonds have been paid.

Recommendation

- (33) The most practical way for political subdivisions to solve common problems is for them to enter into intergovernmental agreements. Such agreements would essentially leave local responsibilities in place with the local districts, while regional problems could be addressed by a cooperative effort. The contracts by their terms would set forth the responsibilities among the parties and provide for the funding, management and operation of the systems, without obtaining legislative or county approval in most cases.

D. COMMUNICATION AND INTERACTION AMONG LOCAL INDUSTRIAL, GOVERNMENTAL AND UTILITY GROUPS REGARDING LONG-RANGE PLANNING

The dynamics of growth force change, and change is coming quickly. However, it will be disjointed unless long-range planners coordinate and exchange information.

The simple truth is that each political planning agency and each infrastructure provider can no longer go its own way, oblivious and unconcerned about the other. Regional planning is a must.

The key is frequent open discussion and the exchange of data and planning information among those who have the power to implement change. A communications group is necessary to accomplish this purpose. The group should include one representative from the following: county planning commissions and COGS; natural gas providers, electrical

power providers, water and wastewater utilities; and the South Carolina Department of Transportation.

Representatives of these groups should be selected based on the following criteria:

- Knowledge about their organizations' plans and projects
- Access to data and freedom to exchange it
- Long-range vision
- Ability to communicate persuasively back to their own organizations.

This group should be challenged with the responsibility to share information relating to change and opportunities to coordinate services. Additionally, it should openly discuss and debate future planning, become knowledgeable about regionwide information, and reach a consensus to suggest and support appropriate recommendations in the form of a report prepared for distribution to all principals.

The group should meet quarterly and be structured very informally. In fact, the less structure it has, the better. Creative and innovative ideas are to be encouraged. Essentially, the group should function as a "brain trust" to exchange and transfer information among the participants so that the governing bodies and boards of the participants will, in turn, have sufficient knowledge to be full partners in regional long-range planning. Its main goal would be to facilitate open, active and broad communication throughout the Upstate.

Recommendations

- (34) The identity of the Upstate Roundtable should be retained and its members should be responsible for continuing the review and coordination of **infrastructure** projects and future updating and extension of the long-range plan.
- (35) The Roundtable should have a technical, long-range planning capability to provide ongoing updates on water quality, stream flow quantities, land use, infrastructure condition and GIS or computer mapping. This capability would be the best resource available to the three-basin area for addressing watershed management issues.
- (36) The Roundtable should designate a committee, composed of representatives from the five counties and the six utilities in the three basins, to be responsible for implementation of the plan.

VI. FINANCING THE FUTURE

A. FINANCING THE PLAN

Interagency cooperation and the coordination of resources will be the keys to the successful financing of a regional wastewater treatment plan. Single entities within the planning area may well succeed on their own, but a cooperative effort assures lower capital costs and better service to the customers within the service area.

A review of the future capital needs of the three river basins identified financing requirements for three areas—remediation of infiltration and inflow problems of current systems, construction required to serve the five-county area's projected growth, and system upgrades to meet mandated improvements in water quality. Table 5 (see page 40) outlines the future needs arising within the area from these sources.

Anticipated costs for regional treatment facilities will be phased in as growth in the three basins brings **infrastructure** needs into sharper focus. This plan looks at infrastructure needs and costs in five-year increments as opposed to the total costs over the next 20 years. If the Upstate experiences the growth in demand identified in the plan, the increase in customer base will be just one of several funding sources needed to recover the capital expenditure required to fund the regional system. The balance of the funds should be financed by interagency funding agreements and/or public-private cost-sharing arrangements.

A variety of potential alternative capital financing sources are available. Below is a list of several of the most readily available:

- Commercial banks (short-term only)
- State Revolving Loan Fund
- Traditional revenue bond financing
- Privately-placed debt financing
- Grants from various governmental agencies
- Federal funds
- Interagency financing vehicles

At the time capital funding needs are identified for a specific project, each of these alternatives should be examined to determine the most cost-effective financing approach. Because markets and investor preferences change over time, it is impossible to predict today which future source of capital will be the best.

Recommendations

- (37) Political entities in the Upstate should undertake a comprehensive effort to find funding for the strategic planning and construction of wastewater treatment infrastructure. Such an effort should consider development of costs to be included in federal appropriations.

- (38) The Roundtable supports the general concept of an access fee. Most sewer service providers in the Upstate charge a fee for new connections. The proposed fee would apply to new connections within the three basins.

B. ECONOMIC DEVELOPMENT

Because of the intense competition between regions, it has become common practice for industrial prospects to expect or demand substantial incentives before choosing a future location. At the present time, there is no regional source of funds available to provide an economic incentive package to such prospects.

Recommendations

- (39) The Governor's Office and the S.C. Department of Commerce should be encouraged to expand the Economic Development Set-Aside Fund to include all components of infrastructure related to economic development.
- (40) An Economic Growth and Development Fund should be established, capitalized by relatively small annual contributions from multiple sources and capped at \$1 million. These funds would be allocated to specific projects on a "last resort" basis; that is, after all other avenues of funding had been exhausted and if the project had significant benefits for the development fund's contributors as well as the area economy in general. The following is a noninclusive list of potential fund participants:
- WCRSA
 - Duke Power
 - Greenville Water System
 - Combined Utility System (Easley)
 - Greer Commission of Public Works
 - Piedmont Natural Gas
 - Area Chambers of Commerce
 - Upstate cities and counties in the three-basin area

C. QUALITY GROWTH

Currently, no resources are available to develop new infrastructure in areas where development is consistent with the planned growth of our region. This situation presents a particularly complex problem. The amount of money required is substantial, demands are great on limited resources, and there is no guarantee of when or if there will ever be a return on investment. Nevertheless, planning when and where infrastructure will be developed is a

key element of orderly growth. Moreover, developing infrastructure as an incentive for growth would open up new areas for industrial recruitment.

Recommendation

- (41) Upstate communities should be encouraged to adopt a long-range commitment to quality growth. County and municipal governments should explore innovative as well as traditional revenue sources to finance the infrastructure needed to make such growth possible.

The Upstate has a long history of progressive self-reliance in meeting economic challenges. The challenge of providing modern, functional infrastructure is vital to continued economic success for what has become South Carolina's economic engine of growth. Only through coordination and the cooperative efforts of all involved constituencies can this challenge be successfully met.

Table 5
TIMELINE AND REVENUE REQUIREMENTS
By River Basin and Treatment Facility
(In Millions)

	1994-2000	2001-2005	2006-2010	2011-2015	
SALUDA RIVER BASIN					
SALUDA/BRUSHY CREEK					
LOWER COST	2.86	24.51	24.36	13.56	
UPPER COST	2.97	27.07	28.73	19.31	
SALUDA/GEORGES CREEK					
LOWER COST	11.71	20.40	—	0.69	
UPPER COST	12.14	22.54	—	0.87	
SALUDA/GROVE CREEK					
LOWER COST	0.26	10.25	5.37	5.07	
UPPER COST	0.32	11.33	6.33	7.13	
SALUDA/MOUNTAIN CREEK					
LOWER COST	0.47	0.45	9.84	24.39	
UPPER COST	0.49	0.50	11.60	34.89	
SUBTOTAL LOWER COST	15.30	55.61	39.57	43.71	154
SUBTOTAL UPPER COST	15.92	61.44	46.66	62.21	186
REEDY RIVER BASIN					
HUFF CREEK					
LOWER COST	0.27	10.84	7.18	2.80	
UPPER COST	0.43	18.86	13.33	5.90	
LOWER REEDY					
LOWER COST	9.46	3.21	5.11	1.50	
UPPER COST	15.44	5.59	9.49	3.30	
MAULDIN ROAD					
LOWER COST	36.52	6.57	6.30	6.40	
UPPER COST	59.58	11.43	11.70	12.80	
SUBTOTAL LOWER COST	46.25	20.62	18.59	10.70	96
SUBTOTAL UPPER COST	75.45	35.88	34.52	22.00	168
ENOREE RIVER BASIN					
DURBIN CREEK					
LOWER COST	4.41	8.94	3.40	1.00	
UPPER COST	4.67	10.11	4.10	1.30	
GILDER CREEK					
LOWER COST	4.41	8.94	6.06	3.20	
UPPER COST	4.67	10.11	7.31	5.33	
LOWER ENOREE					
LOWER COST	1.48	7.56	0.32	6.50	
UPPER COST	1.57	8.54	0.38	9.56	
NEW ENOREE/DILDINE CREEK					
LOWER COST	1.48	0.33	7.18	6.70	
UPPER COST	1.57	0.37	8.66	9.95	
PELHAM					
LOWER COST	11.67	12.59	4.41	2.50	
UPPER COST	12.37	14.24	5.32	3.25	
TAYLORS					
LOWER COST	10.41	12.67	9.14	2.00	
UPPER COST	11.04	14.32	11.03	2.60	
SUBTOTAL LOWER COST	33.86	51.03	30.51	21.90	137
SUBTOTAL UPPER COST	35.91	57.70	36.80	31.99	162
TOTAL LOWER COST	95	127	89	76	387¹
TOTAL UPPER COST	127	155	118	116	516¹

¹ All totals rounded off. These totals include projected expenses for the rehabilitation of trunk sewers.

VII. LIST OF RECOMMENDATIONS

- (1) Future planning should not be based on the concept of one large regional wastewater treatment complex.
- (2) Locate mid-size regional treatment plants on rivers just below major tributaries to maximize the assimilative capacity of the stream.
- (3) Upgrade into mid-size regional facilities older plants that are well-maintained and well-sited, particularly if open land is available.
- (4) Consolidate older plants, upgrade well-sited plants into regional facilities and build regional treatment plants on the schedule indicated in Table 3.
- (5) Upstate sewer utilities should continue their current policy of allocating capacity on a first-come, first-served basis.
- (6) Permitted capacity for existing industrial users should be based on actual average discharge with provisions for short-term peak flows.
- (7) Existing users should pay an access/reservation fee if they desire to reserve capacity beyond that permitted. The reservation fee should be based on fixed costs plus debt service cost.
- (8) The providers of water and wastewater treatment services should develop and implement a program to educate the community on water conservation issues.
- (9) A comprehensive and continuing program of maintenance and rehabilitation of sewer lines must be carried on throughout the area.
- (10) Separate storage basins should be constructed at wastewater treatment plants to collect excess flows during storm events. The basin contents can then be managed at controlled rates.
- (11) The Roundtable supports the concept of multiple mid-size regional treatment plants along Upstate rivers to optimize the use of river capacity.
- (12) Sewer utilities in the Upstate should seek relief from DHEC in those cases where permit limits less stringent than those based on strict application of the national criteria will not impair the existing and classified uses of receiving streams.

- (13) Relief under DHEC's site-specific regulation should not be conditioned upon conducting extensive studies in the immediate vicinity of the plant discharge where data at other points on the same or similar streams support the conclusion that relief should be granted.
- (14) Through the cooperative efforts of DHEC, Upstate sewer utilities and water quality experts, an improved nutrient model for Lake Greenwood should be developed, and additional studies should be carried out to assess the impact of other point and nonpoint sources in the lake's watershed before more stringent phosphorous limits are imposed on treatment facilities in the Reedy and Saluda River basins.
- (15) As a condition for reissuance of their NPDES permits, smaller, inefficient and outdated domestic wastewater treatment facilities should be required to connect to regional plants.
- (16) Each treatment plant within the region should evaluate alternate strategies for treatment and discharge.
- (17) The individual plant strategies should be evaluated together in a Best Management Practices Plan, which not only optimizes the capacity of individual treatment plants, but also considers the needs of the entire basin.
- (18) The Basin Manager for each of the three basins should work closely with the various stormwater management entities to ensure protection and best use of the rivers. (The "Basin Manager" concept is described in Section V, A.)
- (19) Upstate sewer providers should be actively researching alternative approaches to treating and handling biosolids; moreover, these efforts should focus primarily on alternatives which emphasize recycling and reuse. Such alternatives might include land application, composting, recycling, and ground cover for landfills.
- (20) At least two alternatives should be available to control the entire biosolids flow. This will provide Upstate sewer utilities a choice: if one biosolids disposal alternative—for example, landfilling or incineration—should encounter regulatory problems, then another approach—land application of lime-treated biosolids—would be permitted and ready to go.
- (21) Sewer providers that handle biosolids should encourage demonstration and development projects, particularly those aimed toward regional or basin biosolids management projects.

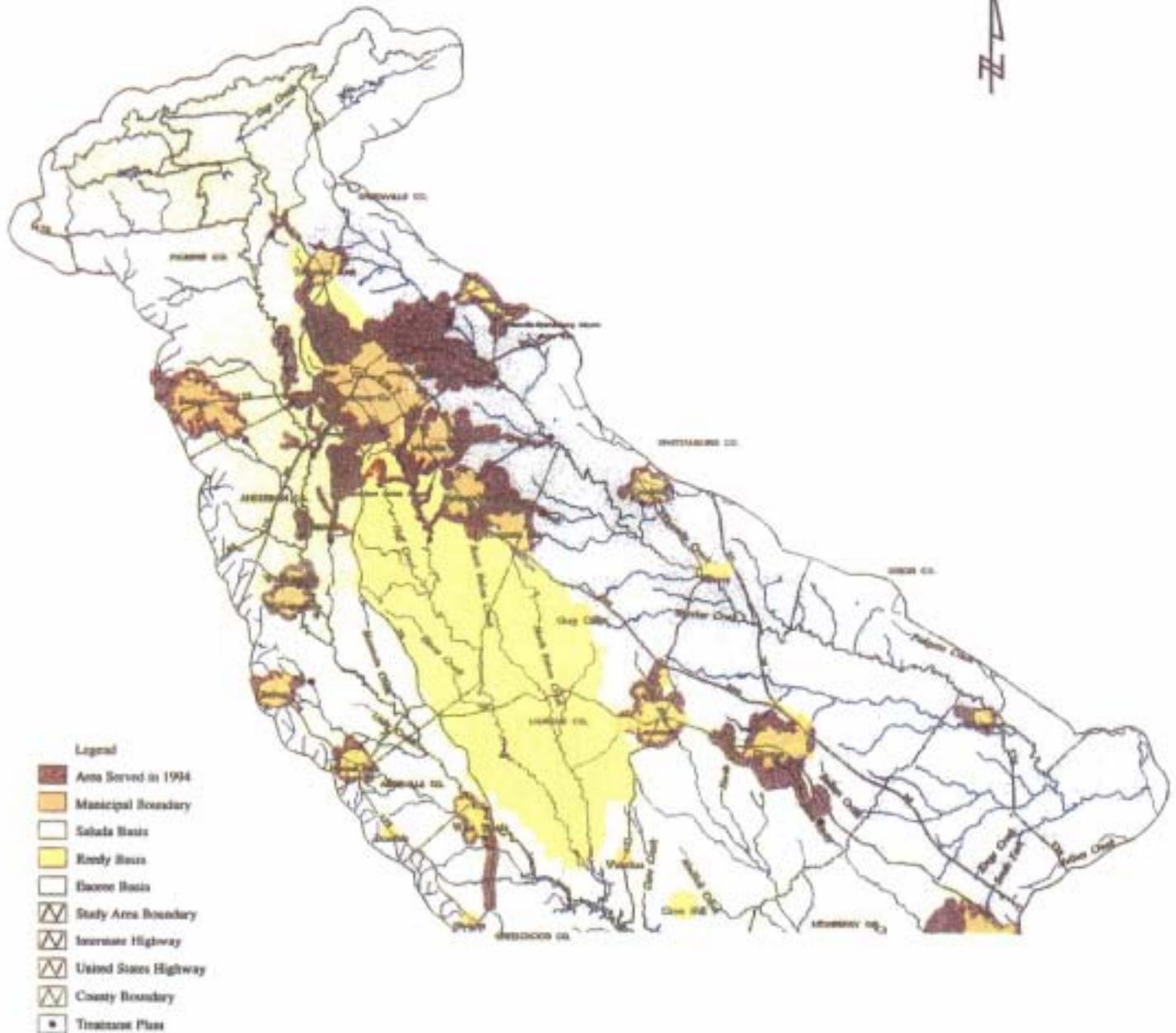
- (22) A policy should be implemented which would:
- prohibit direct discharge of nonindustrial sources of heavy oils and grease into sewer lines
 - require the installation and regular cleaning of grease traps wherever excessive grease is produced
 - establish fees to cover the cost of inspection and disposal.
- (23) Regional sewer authorities should consider privatizing the handling and disposal of oil and grease.
- (24) Upstate sewer utilities, local planning agencies and other regulatory entities should require all septic tank users to connect to collector lines when and where they are available.
- (25) Local sewer authorities should accept septage from areas where local sewer service is not available. The costs of this service should reflect the capital and operating costs of providing the service.
- (26) A Basin Manager should be established for each of the three river basins. It should play the lead role in Section 208 coordination.
- (27) The Basin Manager should be a single entity consisting of the major stakeholders in each basin. The Saluda Basin management entity should consist of a representative from each of the following: Anderson County, Pickens County, the Laurens County Water and Sewer Commission (LCWSC) and WCRSA. The Enoree River Basin Manager should consist of a representative from each of the following: Greer Commission of Public Works, Spartanburg County, LCWSC and WCRSA. The Reedy River Basin would be managed by WCRSA and LCWSC. Each basin manager would have an advisory council composed of a representative from each publicly-owned treatment works within that basin. ACOG would act as a mediator to forge a consensus in situations where conflicts may exist. In this manner, plans will be developed in the interest of the region as a whole.
- (28) Future capacity may require construction of wastewater treatment facilities by multigovernmental entities. The construction and operating costs should be divided among the entities based on capacity requirements.
- (29) To determine the size of a new facility, each entity must decide the amount of capacity needed to meet its projected growth over the next 20 years, coupled with its ability to pay for that capacity.

- (30) If future needs exceed the initial allocation of capacity to a particular entity, that entity may buy capacity from another participant at replacement cost, or participate in the cost of a plant expansion.
- (31) The cost of upgrades resulting from state, federal or other regulatory requirements will be shared by all users and entities on an allocated capacity basis.
- (32) Variable operations and maintenance costs will be charged to the user. Fixed costs should be charged to users and to those holding capacity commitments.
- (33) The most practical way for political subdivisions to solve common problems is for them to enter into intergovernmental agreements. Such agreements would essentially leave local responsibilities in place with the local districts, while regional problems could be addressed by a cooperative effort. The contracts by their terms would set forth the responsibilities among the parties and provide for the funding, management and operation of the systems, without obtaining legislative or county approval in most cases.
- (34) The identity of the Upstate Roundtable should be retained and its members should be responsible for continuing the review and coordination of infrastructure projects and future updating and extension of the long-range plan.
- (35) The Roundtable should have a technical, long-range planning capability to provide ongoing updates on water quality, stream flow quantities, land use, infrastructure condition and GIS or computer mapping. This capability would be the best resource available to the three-basin area for addressing watershed management issues.
- (36) The Roundtable should designate a committee, composed of representatives from the five counties and the six utilities in the three basins, to be responsible for implementation of the plan.
- (37) Political entities in the Upstate should undertake a comprehensive effort to find funding for the strategic planning and construction of wastewater treatment infrastructure. Such an effort should consider development of costs to be included in federal appropriations.
- (38) The Roundtable supports the general concept of an access fee. Most sewer service providers in the Upstate charge a fee for new connections. The proposed fee would apply to new connections within the three basins.

- (39) The Governor's Office and the S.C. Department of Commerce should be encouraged to expand the Economic Development Set-Aside Fund to include **all** components of infrastructure related to economic development.
- (40) An Economic Growth and Development Fund should be established, capitalized by relatively small annual contributions from multiple sources and capped at \$1 million. These funds would be allocated to specific projects on a "last resort" basis; that is, after all other avenues of funding had been exhausted and if the project had significant benefits for the development fund's contributors as well as the area economy in general. The following is a noninclusive list of potential fund participants:
- WCRSA
 - Duke Power
 - Greenville Water System
 - Combined Utility System (Easley)
 - Greer Commission of Public Works
 - Piedmont Natural Gas
 - Area Chambers of Commerce
 - Upstate cities and counties in the three-basin area
- (41) Upstate communities should be encouraged to adopt a long-range commitment to quality growth. County and municipal governments should explore innovative as well as traditional revenue sources to finance the infrastructure needed to make such growth possible.

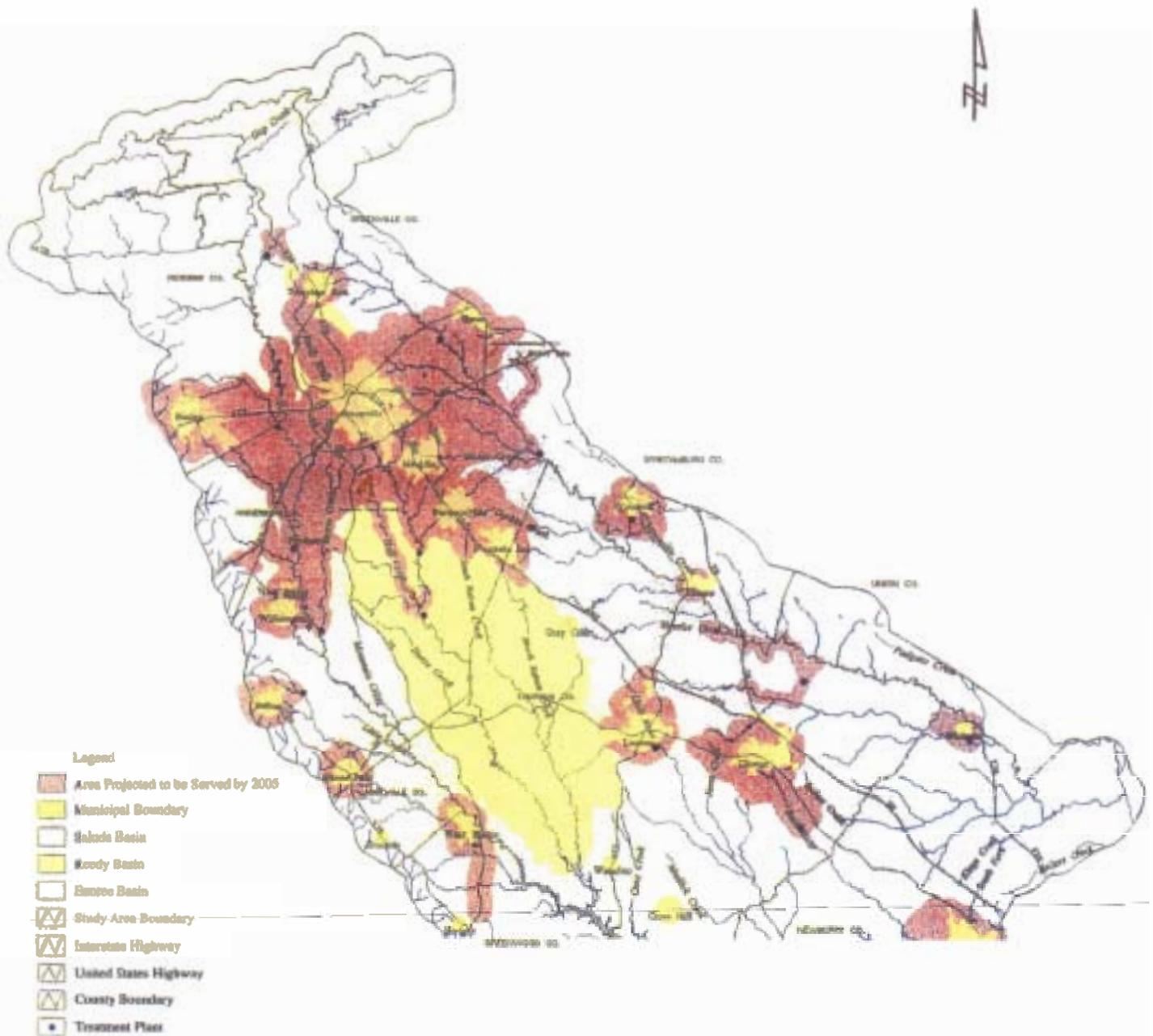
VIII. MAPS

Existing Sewer Service Areas by 1994 Saluda, Reedy, and Enoree River Basins



This Map is a product of the South Carolina Appalachian Council of Governments. Responsibility for the data used in the preparation of this map is assumed by the South Carolina Appalachian Council of Governments and the Applicable Governmental Agency. The South Carolina Appalachian Council of Governments and the Applicable Governmental Agency assume no responsibility or liability with regard to the use of this map.

Projected Sewer Service Areas by 2005 Saluda, Reedy, and Enoree River Basins



The Map is a product of the South Carolina Department of Transportation. Revisions were made to ensure the accuracy of the Map. The South Carolina Department of Transportation and the South Carolina Department of Environmental and Natural Resources do not assume any responsibility or liability with regard to the use of this map.

SCALE 1:50,000 (FP)
1 INCH = 6.75 MILES
August 6, 1994

Projected Sewer Service Areas by 2015 Saluda, Reedy, and Enoree River Basins

