

**QUENCHING OUR STATE'S THIRST:
A REPORT ON THE WATER RESOURCES
OF SOUTH CAROLINA**



by

The League of Women Voters of South Carolina

Water Resources Study Committee

May 2011



ABOUT THE LEAGUE OF WOMEN VOTERS

Established in 1920, the League of Women Voters is a nonpartisan political organization that encourages citizens to play an informed and active role in government. At the local, state, and national levels, the League works to increase understanding of major public policy issues through education and influences public policy through advocacy. Membership in the League is open to any citizen of voting age, male or female.

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FOREWARD

In 2009-2011, the League of Women Voters of South Carolina (LWVSC) undertook an in-depth study of South Carolina's water resources—where our water comes from and where it goes, who holds rights to it, how it is regulated, and the adequacy of the water supply to meet the state's needs. League members from across South Carolina adopted the LWVSC Water Resources Study at the state League convention in April 2009.

As is true for all League studies, the study on water resources emerged from motivation by League members to understand a public policy issue of importance to citizens and to have positions that would enable the League to educate citizens and advocate for good governmental policy that benefits all.

In the case of the South Carolina League's water resources study, interest was generated by the League's long-standing support for the protection and wise management of natural resources in the public interest. League interest in water resource issues is heightened by factors that include: huge strains on water supply resulting from surging population growth in South Carolina and our neighboring states; shrinking water levels that are predicted to worsen by frequent, intense droughts associated with climate change; legal questions regarding inter- and intrabasin water rights and transfer decisions; and water demands placed by large-scale industrial and energy generation projects.

Broad national attention has focused in recent years on the increasingly limited availability of water. Water shortages faced by many areas of the United States—not only the arid West—have led some experts to refer to water as the new oil. Issues around access to water have led dozens of states, including South Carolina, to dispute water rights with their neighbors. In 2009, South Carolina challenged North Carolina's proposed water withdrawals from the Catawba River in the U.S. Supreme Court. Interbasin transfers in North Carolina threaten water quality and flow in South Carolina coastal areas. And Atlanta, with its municipal water supply unable to meet demand, is eyeing Lake Hartwell in South Carolina as a potential water source.

Following 18 months of investigation of issues around our state's water supply, the LWVSC Water Resources Study Committee concluded that existing positions of the LWVSC and the League of Women Voters of the United States on water resource issues are adequate to enable the League to take action. Rather than submitting questions to members for consensus, as is typical for League studies, the study committee prepared this final report for the May 2011 LWVSC Convention.

This report is presented as a community service to educate League members, elected officials and the general citizenry about water resource issues that are critical to the wellbeing of all who are fortunate to call South Carolina home.

We hope this report on South Carolina's water resources will prove valuable to citizens as they continue their efforts to make democracy work in South Carolina.

ACKNOWLEDGEMENTS

This study and final report are the product of the efforts of the LWVSC Water Resources Study Committee whose members deserve our thanks. The committee was co-chaired by Mullen Taylor and Joan Kinne-Shulman. Its members included: Peggy Brown, Opal Brown, Chester Sansbury, Elizabeth Weems, and Andy Yasinsac. We extend special thanks to Dianne Haselton for her design and formatting work on the report and to JoAnne Day for her support. The committee would like to acknowledge and thank the following for their assistance over the course of the study project: the South Carolina Department of Natural Resources; David Baize and Larry Turner with the South Carolina Department of Health and Environmental Control; Buddy Atkins, Regulatory Heuristics; Colin Hagan, Southern Alliance for Clean Energy; John Tynan, Co-Director, Clean Air and Water Program, Upstate Forever; Heather Nix, Upstate Forever; Dara Park, Clemson University.

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THE WATER CYCLE

Water on the earth is constantly evolving and transforming by cycling through stages of precipitation, evaporation, transpiration, surface-water runoff and groundwater infiltration.¹ Heat from the sun causes water to evaporate from the surface and causes soil and plants to transpire water into the atmosphere.² This atmospheric water concentrates into clouds, and precipitates to earth.³ Once on the earth's surface, water flows into streams, lakes and oceans, infiltrates the soil and contributes to ground-water storage, or evaporates and transpires back into the atmosphere. This continuous change in the location and physical state of water is known as the hydrologic cycle, or water cycle.⁴

The terms "surface water" and "groundwater" refer to the location of water during this water cycle. Water often moves between surface and ground depending on local conditions. Because surface water and groundwater are hydraulically connected, stream flows and lake levels may be supplemented with groundwater discharging from the river channel or lakebed.⁵ This groundwater discharge serves to store and regulate water in a manner that sustains stream flow during dry weather.⁶ Conversely, groundwater aquifers are recharged when water from rivers and lakes seep into the ground.⁷

The United States experiences an average of 30 inches of precipitation per year.⁸ Of this total, 21 inches are returned to the atmosphere through evaporation and transpiration.⁹ The remaining nine inches maintain groundwater and surface water volumes.¹⁰

South Carolina's water cycle, under normal conditions, contains about 56 inches of water.¹¹ Forty-eight inches, or 85 percent, are derived from precipitation, and eight inches, or 15 percent, are derived from stream flow entering the state from North

¹ SCDNR, SC State Water Assessment, p. 3-1 – 3-2 (2nd. Ed. 2009).

² *Id.*

³ *Id.*

⁴ *Id.*

⁵ A.W. Badr et al., SCDNR, South Carolina State Water Plan, p. 4 (2nd. Ed. 2004).

⁶ Luna B. Leopold, A VIEW OF THE RIVER, p. 2 (Harvard University Press 1994).

⁷ *Id.*

⁸ *Id.*

⁹ *Id.*

¹⁰ *Id.*

¹¹ A.W. Badr et al., SCDNR, South Carolina State Water Plan, p. 8 (2nd. Ed. 2004).

Carolina.¹² About 34 inches are lost through evaporation and transpiration, and 21 inches are lost through discharge from rivers into the Atlantic Ocean.¹³

OVERVIEW OF SURFACE WATER AND GROUNDWATER

South Carolina enjoys abundant water resources. A sizeable portion of the state's water resources is groundwater underlying the coastal plain.¹⁴ Groundwater, found in six major aquifers, serves as the source of drinking water supply for almost one million South Carolinians residing mainly within the Coastal Plain.¹⁵ Even so, surface water is more frequently used due to its greater accessibility (Figure 1).¹⁶ Seventy percent of South Carolinians rely on surface water, while 30 percent rely on groundwater.¹⁷



Figure 1. Surface Water in South Carolina
Source: SCDNR, SC State Water Assessment (2nd ed. 2009)

¹² *Id.*

¹³ *Id.*

¹⁴ A.W. Badr et al., SCDNR, South Carolina State Water Plan, p. 4 (2nd Ed. 2004).

¹⁵ SCDNR, SC State Water Assessment, p. 3-1 – 3-2 (2nd Ed. 2009).

¹⁶ A.W. Badr et al., SCDNR, South Carolina State Water Plan, p. 4 (2nd Ed. 2004).

¹⁷ *Id.*

Almost 30,000 miles of streams flow within the state, discharging on average 31 billion gallons of water per day into the Atlantic Ocean.¹⁸ Stream flow is generally the highest during late winter and early spring and lowest during the summer and fall.¹⁹ Stream flow also varies by region in the state. The mountainous areas of South Carolina enjoy high average rainfall with little variation year round and substantial ground-water reserves, which creates reliable surface water flows.²⁰ In the upper Coastal Plain, migration of groundwater to the surface is the main source of reliable flows.²¹ Lower Piedmont and lower Coastal Plain streams exhibit highly variable flows due to their dependence upon rainfall and runoff.²²

Most of South Carolina’s surface water is stored in man-made reservoirs located on the state’s major rivers (Table I). The 12 largest reservoirs hold almost 15 million acre-feet of surface water, covering approximately 444,000 acres of land. Lakes Hartwell, Thurmond and Russell impound the Savannah River. Lakes Keowee and Jocassee impound the Seneca River. Lakes Murray and Greenwood impound the Saluda River. Lakes Wylie and Wateree impound the Catawba-Wateree River. Lake Marion impounds the Santee River. Lake Moultrie impounds the Cooper River. Lake Monticello is located off the Broad River.

Table I. Storage of South Carolina’s Surface Water

Lake	River	Owner	Surface Area - Acres	Acre-Feet
Hartwell	Savannah	USACE	56,000	2,549,000
Thurmond	Savannah	USACE	70,000	2,510,000
Murray	Saluda	SC E&G	51,000	2,114,000
Marion	Santee	Santee Cooper	110,000	1,400,000
Moultrie	Cooper	Santee Cooper	60,000	1,211,000
Jocassee	Seneca	Duke Energy	7,565	1,185,000
Russell	Savannah	USACE	26,650	1,026,000
Keowee	Keowee	Duke Energy	18,382	1,000,000
Monticello	Broad	SC E&G	6,800	431,050
Wateree	Catawba-Wateree	Duke Energy	13,710	310,000
Wylie	Catawba-Wateree	Duke Energy	12,455	281,900
Greenwood	Saluda	Greenwood County	11,400	270,000
Total			443,962	14,287,950

Source: SC Department of Natural Resources, South Carolina Water Plan, Second Edition (2004)

¹⁸ SCDNR, SC STATE WATER ASSESSMENT, p. xxvii (2nd ed. 2009)

¹⁹ *Id.* at p. 3-6.

²⁰ *Id.* at 3-7.

²¹ *Id.*

²² *Id.*

All of these reservoirs are owned or operated by either the United States Army Corps of Engineers (USACE) or public electric utilities for the purpose of electric power generation. The USACE reservoirs are operated primarily to generate hydropower. Duke Energy, SCE&G and Santee Cooper use their reservoirs for hydropower purposes as well as a source for cooling water needed for thermoelectric or nuclear power.

Evaporation from storage reservoirs can cause significant loss of water, especially during the summer months.²³ Evaporation rates of about 320 million gallons per day occur during June and July on Lake Thurmond, and 120 million gallons occur per day on Lake Russell.²⁴ These evaporation rates are equivalent to a flow of about 500 and 190 cubic feet per second (cfs), respectively.²⁵ During December and January, daily evaporation rates drop to 65 million gallons, or 100 cfs, and 25 million gallons or 40 cfs, respectively.²⁶ “Considering that the average annual stream flow of the Savannah River near Augusta is about 10,000 cfs, the equivalent of five percent of the flow is evaporated from Lake Thurmond during the summer.”²⁷

South Carolina’s River Basins

The South Carolina Department of Health and Environmental Control (DHEC) describes surface waters of South Carolina as consisting of eight river basins: the Broad River Basin, the Catawba River Basin, the Edisto River Basin, the Pee Dee River Basin, the Salkehatchie River Basin, the Saluda River Basin, and the Santee River Basin.²⁸ All of these Basins, with the exception of the Edisto and the Salkehatchie, are shared with neighboring states. Each river basin is made up of many watersheds, defined by DHEC as:

A watershed is an area of land where all of the water, on the surface and underground, drains to a common place such as a lake, river or the ocean. Watersheds come in all sizes and cross city, county, state and national political boundaries. All living things, including humans, are connected in a watershed so even if you don’t live near a body of water, your everyday actions may affect water quality because you are always in a watershed.²⁹

Source: SCDNR, SC State Water Assessment (2nd ed. 2009)

²³ SCDNR, SC STATE WATER ASSESSMENT, p. 4-7 (2nd Ed. 2009).

²⁴ *Id.*

²⁵ *Id.*

²⁶ *Id.*

²⁷ *Id.*

²⁸ DHEC’s delineation of river basins differs from DNR’s delineation of river basins in that DHEC breaks out the Saluda and Salkehatchie Rivers into separate basins whereas DNR includes these two Rivers within the Santee Basin and Edisto Basin, respectively.

²⁹ SCDHEC, Watersheds, <http://www.scdhec.gov/environment/water/shed/index.htm>.



Figure 2. River Basins in South Carolina

Broad River Basin

The Broad River Basin includes 27 watersheds and 2.5 million acres within South Carolina.³⁰ The Broad River originates in North Carolina and flows into South Carolina near the town of Blacksburg north of Gaffney.³¹ The North Pacolet River also originates in North Carolina, entering South Carolina northeast of the town of Landrum, and flowing through Spartanburg County.³² Rising near Glassy Mountain and flowing through Spartanburg County, the South Pacolet is impounded by Lake Bowen and Spartanburg Reservoir #1 before joining with the North Pacolet to form the Pacolet River.³³ The Pacolet then flows into the Broad River north of Lockhart.³⁴ The Enoree River, another prominent river in the Broad River Basin, rises near Travelers Rest in Greenville County and drains into the Broad River.³⁵ The Tyger River is formed by the confluence of the South Tyger, Middle Tyger and North Tyger near the town of Woodruff, and drains into the Broad River.³⁶ As the Broad River flows through Union, Chester and Fairfield counties, it flows through the Sumter

³⁰ SCDHEC, Broad River Watershed Water Quality Assessment (2007).

³¹ *Id.*

³² *Id.*

³³ *Id.*

³⁴ *Id.*

³⁵ *Id.*

³⁶ *Id.*

National Forest, and accepts drainage from Turkey Creek, the Sandy River, the Little River, and Cedar Creek before converging with the Saluda River in Columbia.³⁷

Catawba River Basin

The Catawba River Basin encompasses 21 watersheds and 1.5 million acres within South Carolina.³⁸ The Catawba River originates in northwestern and western North Carolina and enters South Carolina as Lake Wylie, north of Rock Hill.³⁹ The Catawba River becomes the Wateree River at the headwaters of Lake Wateree northwest of Camden, and eventually joins with the Congaree River at Lake Marion.⁴⁰ The Catawba River Basin is dominated by 11 impoundments owned and operated by Duke Energy.⁴¹ In 2008, *American Rivers*, a national river conservation group, named the Catawba-Wateree River as the most endangered river in the United States due to poor water supply management.⁴²

Edisto River Basin

The Edisto River Basin is located completely within the state of South Carolina, incorporates 29 watersheds and some two million acres.⁴³ The Edisto River originates in central South Carolina as the North Fork Edisto River in Lexington County and the South Fork Edisto River in northern Aiken County.⁴⁴ After the two forks merge below the city of Orangeburg east of Bamberg, the Edisto eventually empties into the Atlantic Ocean.⁴⁵ The Edisto River is the longest completely unimpounded, free-flowing blackwater river in North America.⁴⁶ The lower Edisto Basin forms a crucial part of the ACE Basin, an area that encompasses the Edisto River's bottomlands confluence with the Ashepoo and Combahee Rivers.⁴⁷ The ACE Basin is home to a National Wildlife Refuge, and is the focus of comprehensive conservation efforts.⁴⁸

³⁷ *Id.*

³⁸ SCDHEC, Watersheds, Catawba River Basin, *available at*: http://www.scdhec.gov/environment/water/shed/cat_main.htm.

³⁹ SCDHEC, Catawba River Watershed Water Quality Assessment (2005).

⁴⁰ *Id.*

⁴¹ *Id.*

⁴² American Rivers, *America's Most Endangered Rivers, 2008*, *available at*: http://www.americanrivers.org/assets/pdfs/mer-past-reports/MER_Report2008optb969.pdf.

⁴³ SCDHEC, Watersheds, Edisto River Basin, *available at*: http://www.scdhec.gov/environment/water/shed/ed_main.htm.

⁴⁴ SCDHEC, Watershed Water Quality Assessment, Edisto River Basin (2004).

⁴⁵ *Id.*

⁴⁶ http://en.wikipedia.org/wiki/Edisto_River.

⁴⁷ SCDHEC, Watershed Water Quality Assessment, Edisto River Basin (2004).

⁴⁸ <http://www.dnr.sc.gov/marine/mrri/acechar/esresman.htm>.

Pee Dee River Basin

The Pee Dee River Basin includes 45 watersheds and 5.5 million acres within South Carolina.⁴⁹ The Great Pee Dee River originates as the Yadkin River in northwest North Carolina and enters South Carolina northwest of Cheraw.⁵⁰ It then crosses the Coastal Plain, entering Winyah Bay and discharging into the Atlantic Ocean.⁵¹ The Great Pee Dee is free flowing within South Carolina, but is heavily regulated in North Carolina by a series of six reservoirs primarily operated for hydropower purposes.⁵² The Little Pee Dee River originates in southeastern North Carolina and joins the Great Pee Dee at the southern end of Marion County.⁵³ The Lynches River originates in North Carolina and flows into South Carolina along Lancaster and Chesterfield counties, eventually discharging into the Great Pee Dee near Johnsonville.⁵⁴ The Black River originates south of the town of Bishopville, emptying into the Great Pee Dee near Georgetown⁵⁵. Portions of the Black River, Lynches River and Great Pee Dee River are protected as State Scenic Rivers.⁵⁶ The Waccamaw River flows across the South Carolina state line from North Carolina and further downstream joins the Great Pee Dee River as it forms Winyah Bay and drains into the Atlantic Ocean.⁵⁷

Salkehatchie River Basin

The Salkehatchie River Basin is located entirely within South Carolina and encompasses 25 watersheds and two million acres.⁵⁸ This basin includes the Ashepoo River, the Salkehatchie River (which becomes the Combahee River near the coast), and the Coosawhatchie River.⁵⁹ The Salkehatchie River rises near the city of Barnwell and merges with the Little Salkehatchie River in Colleton County, forming the Combahee River.⁶⁰ The Combahee flows into the Coosaw River that then empties into St. Helena Sound near Beaufort.⁶¹ The Ashepoo River rises near the

⁴⁹ SCDHEC, Watershed Water Quality Assessment, Pee Dee River Basin (Dec. 2007), *available at*: <http://www.scdhec.gov/environment/water/shed/docs/pd-005-07.pdf>.

⁵⁰ *Id.*

⁵¹ *Id.*

⁵² *Id.*

⁵³ *Id.*

⁵⁴ *Id.*

⁵⁵ *Id.*

⁵⁶ SCDNR, Scenic Rivers, *available at*: <http://www.dnr.sc.gov/water/river/index.html>.

⁵⁷ SCDHEC, Watershed Water Quality Assessment, Pee Dee River Basin (Dec. 2007), *available at*: <http://www.scdhec.gov/environment/water/shed/docs/pd-005-07.pdf>.

⁵⁸ SCDHEC, Watersheds, Salkehatchie River Basin, http://www.scdhec.gov/environment/water/shed/salk_main.htm.

⁵⁹ SCDHEC, Watershed Water Quality Assessment, Salkehatchie River Basin (2010), *available at*: <http://www.scdhec.gov/environment/water/shed/docs/salk.pdf>.

⁶⁰ *Id.*

⁶¹ *Id.*

city of Walterboro and flows into St. Helena Sound.⁶² The Coosawhatchie River originates near the town of Allendale, and merging with the Pocotaligo River in Jasper County to form the Broad River.⁶³ The Broad River joins the Chechessee River and the Beaufort River to form Port Royal Sound.⁶⁴ The coastal areas of the Ashepoo and Combahee combine with the coastal Edisto River to form the ACE Basin, sizeable portions of which are preserved in extensive conservation easements.⁶⁵

Saluda River Basin

The Saluda River Basin includes 28 watersheds and covers 2.1 million acres.⁶⁶ The Saluda River is formed by two north and south forks near the North Carolina boundary.⁶⁷ Reservoirs on the South Saluda and North Saluda are owned and operated by Greenville Water System. Below its confluence with its south and north forks, the Saluda flows through Greenville County.⁶⁸ The Saluda is joined by Georges Creek, Big Brushy Creek, Big Creek, and Broad Mouth Creek before entering Lake Greenwood.⁶⁹ The Reedy River is joined by Huff Creek and flows through Boyd Mill Pond before joining the Saluda River in the Lake Greenwood headwaters.⁷⁰ Just downstream of the lake, Ninety Six Creek flows into the Saluda River near the city of Greenwood.⁷¹ The Little River originates near the city of Laurens and drains into the Saluda River between Lakes Greenwood and Murray.⁷² The Saluda River, together with the Little Saluda River and the Bush River, then form the headwaters of Lake Murray.⁷³ Downstream from Lake Murray, the Saluda flows through Lexington County where it joins with the Broad River to form the Congaree River.⁷⁴ The Congaree River flows approximately 47 miles before merging with the Wateree River just north of Lake Marion to form the Santee River.⁷⁵ In 2009, the Saluda River was identified by *American Rivers*, a national river conservation group, as

⁶² *Id.*

⁶³ *Id.*

⁶⁴ *Id.*

⁶⁵ *Id.*

⁶⁶ SCDHEC, Watersheds, Saluda River Basin, *available at:* http://www.scdhec.gov/environment/water/shed/saluda_main.htm.

⁶⁷ *Id.*

⁶⁸ SCSHEC, Watersheds, Saluda River Basin, *available at:* <http://www.scdhec.gov/environment/water/shed/saluda.htm>.

⁶⁹ *Id.*

⁷⁰ *Id.*

⁷¹ *Id.*

⁷² *Id.*

⁷³ *Id.*

⁷⁴ *Id.*

⁷⁵ SCDHEC, Watersheds, Congaree River Basin, *available at:* <http://www.scdhec.gov/environment/water/shed/congaree.htm>.

among the most endangered rivers in the United States due to excessive phosphorus derived from wastewater discharges.⁷⁶

Santee River Basin

The Santee River Basin includes 26 watersheds and 2.9 million acres.⁷⁷ The Santee River is formed from the confluence of the Congaree and Wateree Rivers and flows through Lake Marion.⁷⁸ The Santee is diverted in lower Lake Marion, and either flows out of the Santee dam to eventually drain into the Atlantic Ocean via the South Santee River and the North Santee River, or is channeled along a 7.5-mile diversion canal to fill Lake Moultrie. Santee Cooper, South Carolina's electric power utility, impounded the Santee in 1941 to form Lake Marion, which is the largest lake in the state.⁷⁹ After flowing through the Santee Dam, the Santee River is joined by the rediversion canal connecting Lake Moultrie and the Lower Santee River. The diverted Santee River flows through Lake Moultrie's Pinopolis Dam and joins Wadboo Creek to form the Cooper River.⁸⁰ The Cooper River merges with Mepkin Creek to form the West Branch Cooper River, which then converges with the East Branch Cooper River to reform the Cooper River. The Cooper River then accepts drainage from the Back River, Goose Creek, and the Wando River before flowing into the Charleston Harbor and the Atlantic Ocean.

Savannah River Basin

The Savannah River Basin incorporates 35 watersheds and 2.9 million acres in South Carolina, and serves as the boundary between South Carolina and Georgia.⁸¹ Within the Savannah River Basin are the Tugaloo River/Seneca River Basin, the Upper Savannah River Basin, and the Lower Savannah River Basin.⁸² The Savannah is formed by the confluence of the Seneca and Tugaloo Rivers in the mountainous upstate regions of South Carolina, Georgia and North Carolina, becoming the Savannah River below Lake Hartwell. Five large reservoirs operated primarily for hydropower purposes are located within the Upper Savannah Basin, which substantially affects downstream flow below the city of Augusta. Lake Jocassee, on

⁷⁶ American Rivers, *America's Most Endangered Rivers, 2009*, available at <http://www.americanrivers.org/our-work/protecting-rivers/endangered-rivers/saluda.html>.

⁷⁷ SCDHEC, Watersheds, Santee River Basin, http://www.scdhec.gov/environment/water/shed/santee_main.htm.

⁷⁸ *Id.*

⁷⁹ [http://en.wikipedia.org/wiki/Lake_Marion_\(South_Carolina\)](http://en.wikipedia.org/wiki/Lake_Marion_(South_Carolina)).

⁸⁰ SCDHEC, Watersheds, Santee River Basin, Ashley Cooper Rivers, <http://www.scdhec.gov/environment/water/shed/acooper.htm>.

⁸¹ SCDHEC, Watersheds, Savannah River Basin, http://www.scdhec.gov/environment/water/shed/sav_main.htm.

⁸² *Id.*

the Keowee River, extends up the Toxaway and Whitewater Rivers.⁸³ The impoundments and their hydropower generating facilities are owned and operated by Duke Energy.⁸⁴ Immediately downstream from Lake Jocassee is Lake Keowee, owned by Duke Energy and created in 1971 by damming the Keowee and Little Rivers.⁸⁵ Lake Keowee provides water for Duke Energy's Keowee hydropower plant, and provides cooling water for the adjacent Oconee Nuclear Station.⁸⁶ It also serves as a source of drinking water supply for the city of Greenville, and as a popular recreational area.⁸⁷ Below these reservoirs are three impoundments owned and operated by the United States Army Corps of Engineers primarily for hydropower purposes, but also for flood control, recreation and water supply.⁸⁸

Lake Hartwell extends up the Savannah, Tugaloo and Seneca Rivers. Almost immediately below Lake Hartwell on the Savannah River is Richard B. Russell Lake. J. Strom Thurmond Lake is located immediately below Lake Russell. In addition to the hydroelectric power projects associated with these large reservoirs, the Savannah River Basin contains several other hydroelectric projects, including Duke Energy's Bad Creek pumped-storage facility above Lake Jocassee and SCE&G's Stevens Creek project, which help to mitigate the downstream effects of widely varying releases from Lake Thurmond. Below Lake Hartwell, the federally owned Savannah River Site and the Savannah National Wildlife Refuge occupy sizeable portions of the Lower Savannah Basin.⁸⁹ The Savannah River flows into the Coastal Plain and eventually discharges into the Atlantic Ocean near the city of Savannah.

Groundwater

Rainfall that does not evaporate or transpire or fall into surface waters may infiltrate the soil to form groundwater aquifers. The rate of groundwater infiltration depends on the soil characteristics and moisture, the type and extent of vegetative cover, and the topography of the terrain.⁹⁰ Vast amounts of water in South Carolina are stored in aquifers, although some of the water stored in aquifers is not suitable for drinking water supply due to its natural chemical compositions or poor accessibility. Generally speaking, groundwater requires less treatment than surface water, making its use for drinking water supply less costly than surface water. However, groundwater availability is not distributed uniformly across the state.⁹¹ Moreover, overuse of aquifers has led to declining water levels, reversals in

⁸³ SCDNR, STATE WATER ASSESSMENT, p. 8-8.

⁸⁴ *Id.*

⁸⁵ *Id.*

⁸⁶ *Id.*

⁸⁷ *Id.*

⁸⁸ SCDNR, SC STATE WATER ASSESSMENT, Savannah River Basin, p. 8-9.

⁸⁹ *Id.*

⁹⁰ SCDNR, SC STATE WATER ASSESSMENT, p. 3-2 (2nd. Ed. 2009).

⁹¹ *Id.* at 3-24.

groundwater flow and, along the coast, saltwater contamination. As a result, use of groundwater for municipal water supply and industrial processes has become more expensive and more controlled in some areas.

Aquifers within the Upstate (northwestern) region of South Carolina are formed by fractures in impermeable igneous and metamorphic rocks.⁹² Only limited quantities of ground water can be obtained in this region.⁹³

Middendorf Aquifer

The Middendorf Aquifer underlies most of the state's Coastal Plain, and water is drawn from this aquifer in almost all Coastal Plain counties. Pumping from the Middendorf Aquifer has significantly reduced water levels near Charleston and in the region to its northeast.⁹⁴

Black Creek Aquifer

The Black Creek Aquifer underlies the eastern Coastal Plain from a narrow band extending from Lexington County to Sumter County, then widening from Sumter County to Dillon County, and dipping southeastward toward the coastal counties of Horry, Berkeley, Georgetown and Charleston.⁹⁵ Groundwater levels in the Black Creek Aquifer have declined in the eastern part of the Coastal Plain, mainly in Marion, Georgetown, and Horry Counties, due to overuse. The most significant drawdowns occurred along coastal Horry County as a result of population growth. Water levels recovered after the region's major utilities converted to surface-water sources, but resumed decline with increasing golf-course irrigation.

Tertiary Sand Aquifer

The Tertiary Sand Aquifer, underlying the Coastal Plain, varies in its capacity and water quality.⁹⁶ It is widely used in Berkeley, Charleston, Dorchester, Colleton and eastern Hampton Counties.⁹⁷

Floridan Aquifer

⁹² *Id.*

⁹³ *Id.*

⁹⁴ *Id.* at 3-26.

⁹⁵ *Id.* at 3-35.

⁹⁶ *Id.* at 3-36, 3-41.

⁹⁷ *Id.* at 3-41.

The Floridan Aquifer also underlies South Carolina's Coastal Plain and is one of the most extensive and prolific groundwater sources in North America.⁹⁸ The upper permeable zone of this aquifer serves as an important source of groundwater supply in Beaufort, Jasper, Hampton and Allendale Counties.⁹⁹ Saltwater encroachment has occurred within the Floridan Aquifer along the coast.¹⁰⁰ High salt concentrations are found beneath the barrier islands of Charleston County and Edisto Beach.¹⁰¹ The most significant contamination occurs at the north end of Hilton Head Island and adjacent areas of Beaufort County.¹⁰² Groundwater containing more than 50 percent seawater now flows southwestward toward pumping areas at Bluffton and Hilton Head Island and at Savannah, Georgia.¹⁰³

In addition to these major aquifers, there is a complex array of shallow aquifers across the state used for drinking water purposes.¹⁰⁴ These shallow aquifers are easily affected by land use practices.¹⁰⁵

WHO OWNS WATER?

Private Rights

Generally, private property ownership confers upon the owner a "bundle of rights": the right to exclusive possession of the property, the right to exclude others from access and use of the property, the right to the use and enjoyment of the property, and the right to convey the property.

Water does not fit well into this traditional notion of private property ownership because its characteristics and value make it a unique resource.¹⁰⁶ Water is essential to the survival of all living things. Water is continually moving and transforming itself, from rainfall to stream flow to groundwater, and rising into the air through evaporation and transpiration.¹⁰⁷ For these reasons, no one can really "own" water in the fullest sense of the word because no one person can exclusively possess water. Instead, private property rights in water are limited to a right of use and access, with few exceptions.

⁹⁸ *Id.*

⁹⁹ *Id.*

¹⁰⁰ *Id.* at 3-42.

¹⁰¹ *Id.*

¹⁰² *Id.*

¹⁰³ *Id.*

¹⁰⁴ *Id.*

¹⁰⁵ *Id.*

¹⁰⁶ *Id.*

¹⁰⁷ *Id.*

In South Carolina, water use and access are governed by common law, the South Carolina and United States Constitutions, and statutes. Common law is “a body of law derived from judicial decisions and opinions rather than from statutes or constitutions.”¹⁰⁸

Property rights in water are conferred by virtue of ownership of the lands abutting or underneath the water. For non-tidal, inland waters, a person who owns property contiguous to a natural watercourse is called a *riparian owner*.¹⁰⁹ A natural watercourse is a stream or river that flow in a definite channel and discharges into some other stream or water body.¹¹⁰ A person who owns land abutting coastal tidewaters or a natural lake is called a *littoral owner*, and enjoys essentially the same rights of use as riparian owners.

A riparian owner automatically possesses a right to use and access the stream flow running through his or her property.¹¹¹ Each riparian owner has an equal right of use, subject to the corresponding rights of other riparian owners.¹¹² However, a riparian owner may use water only for the benefit of his or her riparian land.¹¹³ And riparian rights may be limited by the state’s power to regulate.¹¹⁴ Most importantly, the use of water must be reasonable, meaning that it causes no harm to other riparian owners.

In contrast, different rules apply to artificial water bodies, such as a manmade lake. Owners of the land underlying an artificial lake may exercise exclusive control of the access and use of the lake and its waters.¹¹⁵ Owners of property abutting an artificial lake do not have any property right to access or use the lake and its waters.¹¹⁶

Public Rights

Superimposed upon these private property rights is a public right to fish, swim, and boat in and on water bodies that are navigable. Tidal and non-tidal navigable waters are held in trust by the state for public use. Under the South Carolina

¹⁰⁸ Blacks Law Dictionary (West 1996).

¹⁰⁹ *Lowcountry Open Land Trust v. State*, 552 S.E.2d 778, 784 (S.C. Ct. App. 2001).

¹¹⁰ *Lawton v. South Bound R.R.*, 39 S.E. 752, 753-754 (S.C. 1901).

¹¹¹ *White v. Whitney Manufacturing Co.*, 38 S.E. 456, 460 (S.C. 1901)

¹¹² *McMahan v. Walhalla Light & Power Co.*, 86 S.E. 194, 195 (S.C. 1915).

¹¹³ Charles E. Hill, *Limitation on Diversion from the Watershed: Riparian Roadblock to Beneficial Use*, 23 S.C. L.REV. 43, 59 (1971).

¹¹⁴ *Lowcountry Open Land Trust v. State*, 552 S.E.2d 778, 784 (S.C. Ct. App. 2001).

¹¹⁵ *Id.*

¹¹⁶ *White’s Mill Colony v. Williams*, 609 S.E.2d 811, 816 (S.C. Ct. App. 2005).

Constitution, “all navigable waters shall forever remain public highways free to the citizens of the state.”¹¹⁷

¹¹⁷ S.C. Const. art. XIV, § 4.

Navigability is defined to include all rivers, streams and lakes that are capable of floating any sort of boat.¹¹⁸ Navigability also requires that the water body in question be connected to a broader system of waterways.¹¹⁹ For example, an isolated pond or lake without a navigable inlet or outlet is not navigable.¹²⁰ DHEC has found almost all perennial rivers, streams and creeks in South Carolina to be navigable.¹²¹ The presence of a dam on a river or stream does not render the river or stream un-navigable.¹²²

The public's right of access and limited use does not give citizens the right to trespass upon private property to access navigable waters. A riparian or littoral owner cannot block the public from swimming, fishing or boating on navigable waters alongside his or her property.¹²³ Likewise, an owner of a navigable artificial lake cannot prevent the public from swimming, fishing or boating on the lake. Reasonable regulations may be imposed on public use of navigable waters, but total blockage of the public's right to use navigable waters is unlawful unless an overriding public interest is shown.¹²⁴

This public trust also carries a duty by the state to protect its water resources. The South Carolina Supreme Court has declared that "everyone has the inalienable right to breathe clean air; to drink safe water; to fish and sail, and recreate upon the high seas, territorial seas and navigable waters"¹²⁵ The state is prohibited from taking action that would impair the public trust. For example, the state, in its permitting of a dock on coastal waters, cannot "substantially impair marine life, water quality, or public access to the area."¹²⁶

Property rights in groundwater are undefined in South Carolina. Traditionally, property owners were considered to exercise absolute ownership of groundwater underlying their land, in keeping with the ancient legal maxim, *cujus est solum ejus est usque ad coelum et ad inferos* (to whomever the soil belongs, he owns also to the sky and to the depths). Thus, in many states, groundwater is excluded from the public trust doctrine. South Carolina law does not appear to place groundwater under a public trust, meaning that groundwater is considered to be private property

¹¹⁸ S.C. Code Ann. § 49-1-10; *see also Hughes v. Nelson*, 399 S.E.2d 24, 25 (S.C. Ct. App. 1990) (for a waterway to be navigable, it "need not accommodate the Carnival Cruise Lines or be able to float the Love Boat.").

¹¹⁹ *White's Mill Colony v. Williams*, 609 S.E.2d 811, 816 (S.C. Ct. App. 2005).

¹²⁰ *Id.*

¹²¹ *See* http://www.scdhec.gov/environment/water/docs/nw_map.pdf. Although the State, through its executive agencies or Attorney General, may make a determination of navigability, a court is the ultimate decider of disputes concerning navigability. *Hughes v. Nelson*, 399 S.E.2d 24, 26 (S.C. Ct. App. 1990).

¹²² *Id.* at 972; *State v. Head*, 498 S.E.2d 389, 390 (S.C. Ct. App. 1997).

¹²³ *State ex rel. Medlock v. S.C. Coastal Council*, 346 S.E.2d 716, 719 (S.C. 1986).

¹²⁴ *State ex rel. Medlock v. S.C. Coastal Council*, 346 S.E.2d 716, 719 (S.C. 1986).

¹²⁵ *Sierra Club v. Kiawah Resort Assocs.*, 456 S.E.2d 397, 402 (S.C. 1995).

¹²⁶ *Id.*

subject to some limitations on use. Other states are moving to expressly declare groundwater to be a public resource.¹²⁷

Riparian common law has many shortcomings. Changes in the condition of a water body or the uses made of it over time create uncertainty that a particular use once deemed reasonable would survive challenge in the future.¹²⁸ Because riparian common law prohibits transporting water off of the riparian property, public water utilities, whose business involves distributing water from a river or stream to off-site customers, are vulnerable to legal challenge.¹²⁹

The question of allocation in times of drought is largely unanswered under riparian law.¹³⁰ Importantly, riparian common law does not adequately take into account the public interest in water use.¹³¹ Under riparian common law, the state has no easy way to assert its interest as the public trustee of its water resources, and this public interest is not a factor in deciding riparian disputes. Some of these problems are remedied through statutory law, which may modify or abrogate common law.

WATER USE IN SOUTH CAROLINA

In South Carolina, almost 1.2 million people rely on groundwater, while 2.8 million people rely on surface water.¹³² South Carolina's population is expected to grow by 600,000 by the year 2025.¹³³ South Carolina projects that its population will increase from approximately four million in 2000 to approximately 5.7 million in 2035, which is approximately a 40 percent increase.¹³⁴ As population increases, so will pressure upon South Carolina's water resources increase, the value of which simply cannot be over-emphasized:

¹²⁷ Alexandra B. Klass & Ling-Yee Huang, *Restoring the Trust: Water Resources and the Public Trust Doctrine, A Manual for Advocates*, p. 10-11 (Center for Progressive Reform 2009), available at: http://www.progressivereform.org/articles/CPR_Public_Trust_Doctrine_Manual.pdf.

¹²⁸ J. Blanding Holman, IV, *The Advent of Modern Riparianism in South Carolina*, 16 S.E. ENVTL L. J., 315 (2008).

¹²⁹ *Id.*

¹³⁰ Joseph W. Dellapenna, *The Law of Water Allocation in the Southeastern United States at the Opening of the Twenty-First Century*, 25 U. ARK. LITTLE ROCK L. REV. 9, * 16 (2002).

¹³¹ Richard C. Ausness, *Water Rights Legislation in the East: A Program for Reform*, 24 WM. & MARY L. REV. 554 (1983).

¹³² SCDHEC, Bureau of Water, S.C. Water Use Report: 2009 Annual Summary, p. 7 (July 2010).

¹³³ *Id.*

¹³⁴ Jack C. Kresslein, *The Freshwater Resource in South Carolina: An Analysis of the Key Policy and Management Issues*, Institute for Public Service and Policy Research, USC, PUB. POLICY & PRACTICE ELEC. J. (Nov. 2008) available at: [http://www.ipspr.sc.edu/ejournal/ejnov08/The percent20Fresh percent20Water percent20Resource.pdf](http://www.ipspr.sc.edu/ejournal/ejnov08/The%20Fresh%20Water%20Resource.pdf).

Water has symbolized opportunity, security, and self-determination. It has economic value, and control over water can also drive social organization and confer political power. The loss of access to freshwater can have serious negative consequences for any community. The loss of water or a serious diminution in the quality of available water negatively impact the health and safety of the users and with that, the overall tax base, community infrastructure, the ability to attract and retain residents and businesses, and eventually, the governing of institutions.¹³⁵

Indeed, 95 percent of American voters value water over any other service they receive, including heat and electricity.¹³⁶ Businesses and industries rank the value of water second only to electricity.¹³⁷ Uncontrollable variables such as physiographic settings and climate play a critical role in determining water availability.¹³⁸ But how water is used can be controlled, and has an impact upon water availability. Table II shows the major types of water use in South Carolina, and their growth trends over a nine-year period.

In 2006, 849 withdrawers reporting to DHEC used over 16.4 trillion gallons of water. Of this total, 99.3 percent was derived from surface water, and 0.7 percent from groundwater.¹³⁹ The largest water users were hydropower facilities, followed by thermoelectric facilities, drinking water supply systems, industrial users, irrigation, golf courses, mining and aquaculture.¹⁴⁰ From 2001 through 2009, the total amount of water used rose and fell but, overall, increased approximately 35 percent.¹⁴¹

¹³⁵ Jack C. Kresslein, *The Freshwater Resource in South Carolina: An Analysis of the Key Policy and Management Issues*, Institute for Public Service and Policy Research, USC, PUB. POLICY & PRACTICE ELEC. J. (Nov. 2008) available at: [http://www.ipspr.sc.edu/ejournal/ejnov08/The percent20Fresh percent20Water percent20Resource.pdf](http://www.ipspr.sc.edu/ejournal/ejnov08/The%20Fresh%20Water%20Resource.pdf).

¹³⁶ ITT Corporation, *Value of Water Survey: Americans on the U.S. Water Crisis*, p. 2 (2010), available at: [http://www.itt.com/valueofwater/media/ITT percent20Value percent20of percent20Water percent20Survey.pdf](http://www.itt.com/valueofwater/media/ITT%20Value%20of%20Water%20Survey.pdf).

¹³⁷ *Id.*

¹³⁸ Jack C. Kresslein, *The Freshwater Resource in South Carolina: An Analysis of the Key Policy and Management Issues*, Institute for Public Service and Policy Research, USC, PUB. POLICY & PRACTICE ELEC. J. (Nov. 2008) available at: [http://www.ipspr.sc.edu/ejournal/ejnov08/The percent20Fresh percent20Water percent20Resource.pdf](http://www.ipspr.sc.edu/ejournal/ejnov08/The%20Fresh%20Water%20Resource.pdf).

¹³⁹ *Id.*

¹⁴⁰ *Id.*

¹⁴¹ *Id.*

Table II. Total Reported Water Use (surface and groundwater) in South Carolina, 2001-2009 (millions of gallons)

Water Use	2001	2002	2003	2004	2005
Hydroelectric	9,796,267.91	11,415,081.44	18,958,207.77	15,203,000.52	15,766,867.08
Thermoelectric	1,624,984.88	2,467,042.32	3,558,474.88	3,232,104.07	4,256,504.44
Water Supply	193,525.29	212,402.79	197,088.27	209,464.30	215,771.05
Industrial	180,579.90	167,051.34	168,334.76	157,309.02	152,086.80
Irrigation	27,121.14	29,668.39	12,172.86	24,119.87	21,924.04
Golf Course	13,302.54	14,022.92	10,373.47	13,230.46	11,908.10
Mining	2,691.75	3,159.88	4,935.07	3,241.62	3,305.18
Aquaculture	865.17	2,283.95	1,451.98	1,355.63	410.31
Other	204.84	106.22	59.033	85.505	105.63
Total	11,839,543.40	14,310,819.25	22,911,098.09	18,843,911.00	20,428,882.61
Facilities	931	848	833	848	862
Water Use	2006	2007	2008	2009	
Hydroelectric	12,408,954.88	10,909,447.63	9,397,612.11	12,446,339.11	
Thermoelectric	3,570,217.17	3,555,221.45	3,574,610.92	3,172,982.29	
Water Supply	225,420.72	239,991.83	225,723.23	216,931.60	
Industrial	138,188.07	146,552.59	132,841.34	128,319.91	
Irrigation	29,157.46	42,222.47	34,492.80	29,786.89	
Golf Course	12,646.90	15,748.70	13,792.55	12,401.49	
Mining	3,723.79	2,373.56	2,316.57	3,088.28	
Aquaculture	320	344.82	293.82	310.143	
Other	54.01	64.31	166.89	62.135	
Total	16,400,793.21	14,911,967.37	13,381,850.23	16,010,221.85	
Facilities	849	866	884	871	

Water Use in Power Generation

Hydroelectric

Hydroelectric power produces electricity from water flowing through turbines located inside a dam that then converts the energy of flowing water into electricity. Most of the water remains in-stream and is non-consumptive. Between 2001 and 2009, hydropower users in South Carolina reported a 26.7 percent increase in water used.¹⁴²

¹⁴² Jack C. Kresslein, *The Freshwater Resource in South Carolina: An Analysis of the Key Policy and Management Issues*, p. 13, Institute for Public Service and Policy Research, USC, PUB. POLICY & PRACTICE ELEC. J. (Nov. 2008) available at: [http://www.ipspr.sc.edu/ejournal/ejnov08/The percent20Fresh percent20Water percent20Resource.pdf](http://www.ipspr.sc.edu/ejournal/ejnov08/The%20percent20Fresh%20percent20Water%20Resource.pdf).

Thermoelectric

Thermoelectric power plants burn fossil fuels to heat water and generate steam, which is then lost through evaporation.¹⁴³ Nuclear plants also use large amounts of water for cooling, and lose water through evaporation.¹⁴⁴

Evaporative cooling for thermoelectric power is a consumptive use of water. These power plants use one of three types of cooling cycles in their generation of electricity: once-through cooling, closed-loop cooling, or dry cooling systems.¹⁴⁵ Once-through cooling systems withdraw water, use it for cooling purposes, and return it to the surface water body.¹⁴⁶ Since once-through cooling systems release heated water back to the water source, they can add to evaporative loss by raising the temperature of receiving water bodies.¹⁴⁷ “Once-through systems are responsible for withdrawing 91 percent of the nation's water used for power plants, and are also utilized by more than half of the country's fleet of nuclear reactors.”¹⁴⁸

Re-circulating or closed-loop systems withdraw water and recycle most of it within the power system instead of returning the used water to the surface water body.¹⁴⁹ Dry cooling systems use air instead of water to cool power stations; they are not widely used but are used to some extent in the arid southwestern United States.¹⁵⁰

Closed-loop systems withdraw much less water but tend to consume more.¹⁵¹ Dry-cooling uses air, but works best in colder weather and in arid areas of the country.¹⁵² Only a very small number of plants rely on dry cooling, since they lower plant efficiency and cost the most.¹⁵³

Between 2001 and 2009, water used for thermoelectric power generation increased by 95 percent in South Carolina.¹⁵⁴

¹⁴³ Dr. Benjamin K. Sovacool, Running on Empty: The Electricity-Water Nexus and the U.S. Electricity Sector, 30 Energy Law Journal 11, 3-4 (2009).

¹⁴⁴ *Id.*

¹⁴⁵ *Id.*

¹⁴⁶ *Id.*

¹⁴⁷ *Id.*

¹⁴⁸ *Id.*

¹⁴⁹ *Id.*

¹⁵⁰ *Id.*

¹⁵¹ *Id.*

¹⁵² *Id.*

¹⁵³ *Id.*

¹⁵⁴ *Id.*

Water Use by Other Sectors

In regard to water uses other than electric power generation, the mining sector increased its water use by 14.8 percent from 2001 to 2009 (see Table III).¹⁵⁵ Public water utilities increased their water usage by 11.8 percent over the same period.¹⁵⁶ Irrigation use increased by 9.8 percent.¹⁵⁷ In contrast, aquaculture water use declined by 64.2 percent, and industrial use declined by 29.3 percent.¹⁵⁸ Water usage by several pulp and paper companies (pulp and paper being about half of all industrial, that is, manufacturing water users) declined because they were forced by U.S. EPA wastewater discharge regulations promulgated in this period to change their manufacturing processes in a way that reduced their water use about 33 percent. Also, many of the large textile dyeing and finishing plants, the next largest industrial water users, closed because of foreign economic competition.

Table III. Total Reported Water Use 2009 (millions of gallons)

Use	Surface Water	Groundwater	Total	Percentage
Aquaculture	80.243	229.9	310.143	0.002
Golf Course	9,257.479	3,144.013	12,401.492	0.0077
Industrial	120,271.624	8,048.285	128,319.909	0.801
Irrigation	11,673.031	18,113.856	29,786.887	0.186
Mining	247.3	2,840.98	3,088.28	0.019
Hydropower	12,446,338.701	0.411	12,446,339.112	77.740
Thermoelectric ¹⁵⁹	330012213.5	1831.573	330014045.1	19.819
Water Supply	178,209.93	38,721.667	216,931.597	1.355
TOTAL	15,937,231.437	72,990.41	16,010,221.847	100.0

Source: South Carolina Department of Health and Environmental Control, Bureau of Water. South Carolina water use report, 2009 annual summary.

MANAGING THE USE OF WATER

Both the federal and state governments play a role in regulating how water is used. The federal government's authority to control water use is limited in its power to regulate commerce under the United States Constitution. States have broad authority to regulate water use in the interest of public health, welfare and safety.

¹⁵⁵ *Id.*

¹⁵⁶ *Id.*

¹⁵⁷ *Id.*

¹⁵⁸ *Id.*

¹⁵⁹ In the interest of consistency, this table combined two categories – nuclear and thermoelectric – into a single thermoelectric category.

Hydropower

Federal law governs the use of water for hydroelectric power generation. Under the Federal Power Act (FPA), the Federal Energy Regulatory Commission (FERC) is empowered to grant licenses to operate non-federal hydropower facilities on navigable waters of the United States.¹⁶⁰ The FPA was enacted for the purpose of comprehensive development of waterpower, which inures to the benefit of the public. The grant of a license is a privilege, not a right, and is justified only upon its benefit to the public.¹⁶¹

Development and maintenance of reliable power sources is an important national interest.¹⁶² However, in making permitting decisions, FERC must take into account other interests in the water body, such as protection, mitigation and enhancement of fish and wildlife, irrigation, flood control, drinking water supply and recreational use.¹⁶³ FERC must not only account for power production interests, but also give “equal consideration” to mitigation, protection and enhancement of fish and wildlife interests, recreation and environmental quality.¹⁶⁴ An important aspect of a FERC license is its requirement that a licensee release a certain amount of water downstream to support these other uses of the river basin.

FERC licenses extend for a period not exceeding 50 years, after which the licensee must reapply for a new license.¹⁶⁵ A licensee must act in strict accordance with its license terms.¹⁶⁶ Once FERC approves a license, FERC can only modify the license “upon mutual agreement between the licensee and the Commission after thirty days notice.”¹⁶⁷ Nevertheless, FERC does include reopener clauses that allow it to change a condition of the license during its term. A reopener clause¹⁶⁸ provides the Commission with the necessary authority, after notice and an opportunity for a

¹⁶⁰ 16 U.S.C. § 797(e).

¹⁶¹ *Northern States Power v. FPC*, 118 F.2d 141, 144 (1941).

¹⁶² *S.C. Pub. Serv. Authority*, 36 F.E.R.C. ¶ 61,061, 61,138 (1986).

¹⁶³ 16 U.S.C. § 803(a)(1) (2000).

¹⁶⁴ 16 U.S.C. § 797(e) (2000).

¹⁶⁵ 16 U.S.C. § 799.

¹⁶⁶ *See Christine Falls Corp.*, 46 F.E.R.C. ¶ 62,163, 63,239 (1989)(a Project licensed with a total generating capacity of 725 kilowatts (kW) cannot exceed this capacity without prior FERC approval).

¹⁶⁷ 16 U.S.C. § 799.

¹⁶⁸ A typical reopener clause, also called a reservation of authority clause, is found in Standard Article 15: “The Licensee shall, for the conservation and development of fish and wildlife resources, construct, maintain, and operate, or arrange for the construction, maintenance, and operation of such reasonable facilities, and comply with such reasonable modifications of the project structures and operation, as may be ordered by the Commission upon its own motion or upon the recommendation of the Secretary of the Interior or the fish and wildlife agency or agencies of any State in which the project or a part thereof is located, after notice and opportunity for hearing.” (Emphasis added.)

hearing, to reopen the license and require changes to project facilities and operation, provided that those changes are supported by substantial evidence.¹⁶⁹

The following license applications are currently pending before FERC: from Santee Cooper to operate Lakes Marion and Moultrie on the Santee and Cooper Rivers; from Duke Energy to operate 13 reservoirs in the Catawba-Wateree River; from SCE&G to operate Lake Murray on the Lower Saluda. Permit renewals for these hydropower projects are significant in that the permit renewals mark the first time that most of these licensees will be subject to requirements of the Clean Water Act and other federal environmental laws.

All of these licensee permits expired before new permits could be issued due to the complexity of issues facing each affected river basin. Currently, these licensees are operating under an annual license that retains obligations and requirements contained in their expired licenses.

Pollution Control

Federal

The U.S. Clean Water Act (CWA) establishes a comprehensive federal water classification, permitting and planning scheme that governs how the quality of the nation's waters is to be protected. The CWA authorizes use of rivers and streams to discharge pollutants, so long as those discharges of pollutants meet specific limits. The foundation of the CWA is the establishment of a water quality classification system whereby water bodies are designated for particular uses. Each designation carries water quality standards that must be met in order to sustain those designated uses.

These water quality standards contain specific limits on the level of pollutants that may be present in rivers and streams. The CWA requires that a person who discharges pollutants into waters of the United States from a pipe, ditch, channel or other discrete conveyance must obtain a permit called a National Pollutant Discharge Elimination System (NPDES) Permit.¹⁷⁰ The Permit sets forth limitations on the discharge of pollutants based upon available pollution control technology and water quality standards established for the water body in which the pollutants are discharged. These two elements are intended to work in conjunction to improve water quality. The CWA contains other important protections such as wastewater planning and permitting requirements for dredging and filling waters of the United States. The CWA does not directly regulate the quantity of water used.

¹⁶⁹ *Puget Sound Energy*, 95 F.E.R.C. ¶ 61,319, *14 (2001).

¹⁷⁰ 33 U.S.C. § 1342.

State

The CWA is administered primarily through the states with oversight by the U.S. Environmental Protection Agency (EPA). In South Carolina, the EPA authorized the state Department of Health and Environmental Control (DHEC) to administer the CWA's permitting programs in 1975.¹⁷¹ However, the EPA retains various oversight and approval authority for permitting procedures and standards. Additionally, the EPA reviews DHEC's permitting decisions and may object to a proposed permit and ultimately veto state issued permits if inconsistent with the requirements of the CWA.¹⁷²

Originally enacted in the 1950s, the South Carolina Water Pollution Control Act (SCWPA)¹⁷³ is South Carolina's basic law with regard to regulation of water quality, and is used to implement the CWA in South Carolina. It declares the public policy of the state to maintain reasonable standards water purity, balancing the needs of public health and welfare with employment and industrial development.¹⁷⁴ The SCWPA directs DHEC to adopt standards indicating polluted conditions in water and air.¹⁷⁵ The SCWPA and its regulations are, in some respects, broader in its scope and application than the CWA. For example, the SCWPA regulates groundwater quality, whereas the CWA does not.

Water Quality Standards

The CWA and SCWPA establish water quality standards to protect important categories of water uses, such as public water supply, recreation, fish and wildlife protection, and industrial use. For each use category, water quality criteria are established to protect those uses. Water quality standards are used to define permit limits for discharge of pollutants under a NPDES permit and any other activities that may impact water quality. These standards serve as the guiding principles of all pollution related decisions made by DHEC.¹⁷⁶

The South Carolina Water Quality Standards are found in Regulation 61-68. DHEC has established six water-use classifications based on the desired use for each water body in South Carolina: Outstanding Water Resource, Freshwater, Trout Waters, Shellfish Harvesting, Class SA Waters, and Class SB Waters.¹⁷⁷ Thus, each river, stream or lake in South Carolina is designated as one or more of these use

¹⁷¹ SCDHEC, NPDES Permitting, *available at*: <http://www.scdhec.gov/environment/water/npdespage.htm>.

¹⁷² 40 C.F.R. § 123.44.

¹⁷³ S.C. Code Ann. § 48-1-20 *et seq.*

¹⁷⁴ S.C. Code Ann. § 48-1-20.

¹⁷⁵ S.C. Code Ann. § 48-1-40.

¹⁷⁶ S.C. Code Reg. 61-68 (Preamble).

¹⁷⁷ S.C. Code Reg. 61-69.

categories. If a tributary to a river or stream is not identified, then it is classified according to the designation of the river or stream into which it discharges.¹⁷⁸

DHEC is authorized to prescribe standards for water quality of each classification considering the extent of floating and suspended solids, bacteriological organisms, oxygen levels, and other physical, chemical or biological properties.¹⁷⁹ The water quality standards for each classification contain narrative standards, numerical standards, and site-specific standards. Narrative standards are “general descriptions of water quality that are not quantifiable.”¹⁸⁰ Numerical standards are quantifiable, and are used in permits to define the limits of allowable pollutants such as pH, dissolved oxygen, ammonia, fecal coliform and temperature. Site-specific standards are numerical standards that supersede or augment general numerical standards for a particular location.¹⁸¹ The Act provides factors for DHEC to consider in developing classifications and standards for water.¹⁸²

DHEC’s water quality standards include anti-degradation rules designed to protect existing uses from future activity that may degrade water quality levels necessary to support those existing uses.¹⁸³ Furthermore, high quality waters are protected from future dischargers by requiring maintenance of standards to support recreation and propagation of fish, shellfish and wildlife, unless the surface water exceeds standards to protect those uses and DHEC determines, “after intergovernmental coordination and public participation, that allowing lower water quality is necessary to important economic or social development in the areas where the waters are located.”¹⁸⁴

Section 303(c)(2)(B) of the CWA requires that a state review and amend, as necessary, its water quality standards at least once every three years in order to incorporate updated EPA criteria recommendations and policies. South Carolina’s water quality standards were last amended on April 25, 2008. In 2010, DHEC began the promulgation process for review and potential revision of its water quality standards found in S.C. Regulation 61-68 and S.C. Regulation 61-69, *Classified Waters*. In response to DHEC’s notice inviting public comment, 20 organizations

¹⁷⁸ *Id.* at (B).

¹⁷⁹ S.C. Code Ann. § 48-1-70.

¹⁸⁰ Palmetto Conservation Foundation and S.C. Dep’t of Health & Env’t Control, *CITIZENS GUIDE TO CLEAN WATER*, pg. 12 (undated). *Available at:* <http://www.scdhec.gov/environment/water/docs/citgd.pdf>.

¹⁸¹ S.C. Code Reg. 61-69(C)(12).

¹⁸² S.C. Code Ann. § 48-1-80.

¹⁸³ S.C. Code Reg. 61-69((D)).

¹⁸⁴ *Id.* at (D)(2).

submitted recommended revisions to South Carolina's water quality standards and water classifications.¹⁸⁵

On November 26, 2010, DHEC issued a Notice of Proposed Regulation.¹⁸⁶ DHEC held an informational forum on December 6, 2010, and solicited additional comments due by December 29, 2010.¹⁸⁷ A public hearing before the DHEC Board of Commissioners was held on February 10, 2011.¹⁸⁸ After the hearing, the Board approved (promulgated) the proposed changes to the water quality standards, Regulation (R61-68). They were subsequently filed by DHEC with the General Assembly pursuant to the SC Administrative Procedures Act. The General Assembly had 120 days of opportunity to review and act on the Regulations, which would not elapse until February 2012, or they can act on them before the 120-day period ends. The changes will not become effective and enforceable until after General Assembly approval (both chambers), EPA approval, and publication in the State Register as final regulations.¹⁸⁹

Water Quality Certifications

Section 401 of the CWA requires that any applicant for a federal license or permit who conducts an activity that during construction or operation may result in discharge to navigable waters first obtain a "401 Certification" from the state-designated permitting agency. No federal license or permit is to be granted until "401 Certification" is obtained, stating that the activity will comply with applicable water quality standards.¹⁹⁰ Activities requiring 401 Certification include, but are not limited to, Federal permits or licenses to dredge or fill navigable waters or wetlands, and hydropower licenses. Under this authority, states possess the power to impose conditions upon federal permits. A state 401 Certification may impose minimum stream flow requirements that a hydropower facility must release downstream.¹⁹¹ A denial of a 401 Certification may have the effect of denying the federal permit.

Due to budget cuts affecting DHEC, that agency has determined that it no longer has the resources to review and issue 401 Certifications for general permits issued by

¹⁸⁵ See Summary of Public Comments and Departmental Responses for Proposed Amendment of R.61-68, Water Classifications and Standards, October 14, 2010, available at:

http://www.scdhec.gov/environment/water/docs/wq_res.pdf.

¹⁸⁶ See http://www.scdhec.gov/environment/water/wq_standard.htm.

¹⁸⁷ *Id.*

¹⁸⁸ *Id.*

¹⁸⁹ *SC Administrative Procedures Act C., D., SECTION 1-23-125., A-E.*

¹⁹⁰ 33 U.S.C. § 1341(a)(1).

¹⁹¹ *PUD No. 1 of Jefferson County and City of Tacoma V. Washington Department of Ecology*, 511 U.S. 700 (1994).

the United States Army Corps of Engineers and for groins and beach re-nourishment activities.¹⁹²

¹⁹² See DHEC Public Notice, 401 Water Quality Certification Resource Reductions (Oct. 22, 2010) available at: <http://www.scdhec.gov/administration/regs/notice-401.htm>.

NPDES Permits

Section 402 of the CWA creates the “National Pollutant Discharge Elimination System,” (NPDES) requiring a permit for the point source discharge of pollutants into the waters of the United States. “Pollutant” is defined broadly and includes “dredged spoil, solid waste, incinerator residue, sewage, garbage, sewage sludge, munitions, chemical wastes, biological materials, radioactive materials, heat, wrecked or discarded equipment, rock, sand, cellar dirt, and industrial, municipal, and agricultural waste discharged into water.”¹⁹³ Point sources are defined broadly, and include discrete conveyances such as pipes, sewers, ditches and channels.¹⁹⁴ The term “waters of the United States” is defined to include lakes, rivers, streams, and connecting or adjacent wetlands used or susceptible to use in the future for interstate commerce, all interstate waters, and intrastate waters that would affect interstate commerce through use, degradation or destruction.¹⁹⁵ Under the CWA and the SCPCA, it is unlawful to discharge pollutants into waters of the United States and/or of the state without a NPDES permit.

The NPDES permitting program covers wastewater discharges from sewer plants and from industries. It also covers storm water discharges from construction sites, industrial sites, and from municipal curb, gutter and ditch systems that drain stormwater. A NPDES permit sets limits on the type and amount of specified pollutants that can be discharged. A permit also imposes water quality monitoring and reporting requirements. In the case of a stormwater NPDES permit, a stormwater management plan is required. DHEC will issue a permit to the applicant if it finds that the discharge will not “reduce the quality of the receiving waters below the classification established for them and will not violate any applicable provisions of state or federal laws or regulations.”¹⁹⁶ A permit is effective for five years, after which the permittee must seek a permit renewal.

Impaired Waters and Total Maximum Daily Loads

Pursuant to § 303(d) of the CWA, any water body that fails to meet the state’s water quality standards must be included on an inventory of impaired waters.¹⁹⁷ The state or the U.S. EPA must develop a Total Maximum Daily Load (TMDL) for the pollutant causing the impairment.¹⁹⁸

¹⁹³ 33 U.S.C. § 1362(6); 40 CFR § 122.2.

¹⁹⁴ 33 U.S.C. § 1367.

¹⁹⁵ 40 C.F.R. § 122.2.

¹⁹⁶ Palmetto Conservation Foundation and S.C. Dep’t of Health & Env’t Control, CITIZENS GUIDE TO CLEAN WATER, pg. 19 (undated). *Available at:* <http://www.scdhec.gov/environment/water/docs/citgd.pdf>.

¹⁹⁷ 33 U.S.C. § 1314(l)(1).

¹⁹⁸ 33 U.S.C. § 1313(1)(C).

A TMDL is the calculated maximum allowable pollutant loading to a water body at which water quality standards can be met.¹⁹⁹ A TMDL is made up of two components: a load allocation and a waste load allocation. A load allocation is the portion of the receiving water's loading capacity attributed to existing or future nonpoint sources or to natural background sources. The waste load allocation is the portion of a receiving water's loading capacity allocated to an existing or future point source. Thus, a TMDL would establish a maximum capacity for discharge of a certain pollutant that would then be divided among the affected NPDES permittees.

STATUS OF WATER QUALITY IN SOUTH CAROLINA WATER BODIES

According to DHEC, 65.7 percent of all streams and rivers in South Carolina fully support use of its waters for aquatic life and recreation;²⁰⁰ 33.3 percent of rivers and streams do not support aquatic life; and 46.6 percent do not support recreational use. Taking into account all designated uses of water, only 31 percent of all rivers and streams fully support all designated uses of water; 91.9 percent of all lakes fully support aquatic life; and 100 percent fully support recreational use.²⁰¹ Taking into account all designated water uses, 91.9 percent of lakes fully support all uses, and 8.1 percent do not fully support all uses.

Withdrawal of Surface Water

South Carolina Surface Water Withdrawal, Permitting, Use and Reporting Act.

After many years of debate, contention and compromise, the South Carolina Surface Water Withdrawal, Permitting, Use and Reporting Act (Act) was enacted in 2010. The Act replaced South Carolina's previous Surface Water Reporting Act and Interbasin Transfer Act and instituted for the first time a comprehensive state permitting system for surface water withdrawals.

The Act solves some of the problems of riparian common law while maintaining the basic riparian concept of reasonable use. It does not, however, entirely do away with riparian common law. The Act is complex and difficult to navigate. Overall, the Act provides significant protections to owners of impoundments, withdrawals for

¹⁹⁹ 40 C.F.R. § 130.2(a)(i).

²⁰⁰ State of South Carolina Integrated Report for 2010 Part II: Section 305(b) Assessment & Reporting, available at: http://www.scdhec.gov/environment/water/tmdl/docs/tmdl_10-305b.pdf.

²⁰¹ Id.

agricultural and energy purposes, and all pre-existing surface water withdrawers. A surface water withdrawal permit issued under the Act does not give the permittee any fixed, enduring right to always be able to withdraw the amount of water authorized by an issued permit.²⁰² As with riparian common law, a permittee has a right to use surface water. However, that right is governed by the terms and conditions of the permit authorized by the Act.

Any person withdrawing surface water in excess of three million gallons during a single month from the same general location must obtain a withdrawal permit from DHEC unless exempted under the Act.²⁰³ “Withdrawal” is broadly defined as “to remove or divert water from its natural course or location regardless of whether the water is returned to its waters of origin, consumed, or discharged elsewhere.”²⁰⁴ Thus, a person withdrawing over three million gallons of surface water in any one month from a river basin and returning that water back to the same basin, or withdrawing over three million gallons of surface water in any one month from a river basin and putting that water back in a different basin, are subject to the requirements of the Act as opposed to the rules of riparian common law. Conversely, any surface water withdrawals, whether interbasin or intrabasin, less than three million gallons in any one month, are not required to obtain a permit. Instead, these withdrawals are subject to riparian common law.

Expressly exempt from the permit requirements of the Act are:

1. withdrawals associated with active instream dredging or sand mining operations or other non-consumptive instream mining operations;
2. emergency withdrawals;
3. agricultural uses from a farm pond owned by the person making the withdrawal, or situated on two or more separately owned parcels if each property owner agrees to the withdrawal;
4. withdrawals from a pond completely situated on private property and fed from rainwater or springs located entirely on that private property;
5. naturally occurring evaporation from impoundments;
6. withdrawals, use or discharges for the purpose of wildlife management; and
7. a special purpose district withdrawing surface water from a pond entirely located on property owned by the special purpose district and supplied by rainwater or springs completely situated on the special purpose district’s property.²⁰⁵

²⁰² S.C. Code Ann. § 49-4-110(A).

²⁰³ S.C. Code Ann. § 49-4-20(28); § 49-4-25.

²⁰⁴ S.C. Code Ann. § 49-4-20(29).

²⁰⁵ S.C. Code Ann. § 49-4-30(A).

An important aspect of the Act is its establishment of minimum instream flows that must be retained in the water body in order to “provide adequate supply of water at the surface water withdrawal point to maintain the biological, chemical, and physical integrity of the stream taking into account the needs of downstream users, recreation, and navigation”²⁰⁶ During January, February, March, and April, the minimum instream flow is set at 40 percent of the mean annual daily flow.²⁰⁷ During May, June, and December, the minimum instream flow is set at 30 percent of the mean annual daily flow.²⁰⁸ From July through November, the minimum instream flow is set at 20 percent.²⁰⁹

However, these established seasonal flows do not apply to river segments located downstream from and influenced by licensed impoundments such as those owned by Duke Energy, Santee Cooper and SCE&G, and municipal water utilities that own impoundments.²¹⁰ Surface water withdrawals located downstream from a licensed impoundment “are considered to be influenced by the impoundment unless it can be demonstrated by [DHEC] through flow modeling and analysis of flow data that the withdrawal point is no longer materially influenced by the impoundment.”²¹¹ For these influenced segments, no particular percentage of water is established as minimum instream flow. Rather, the minimum instream flow is set as the minimum amount of water required to be released downstream from the impoundment by the Federal Regulatory Energy Commission (FERC) in the case of hydropower generation, or by the U.S. Army Corps of Engineers, in the case of construction of or improvements to an impoundment.²¹² In either case, DHEC does have the power to impose stream flow conditions as part of these federal licenses or permits.²¹³

The Act provides additional protections to owners of impoundments. For any surface water withdrawals from a licensed impoundment, DHEC is prohibited from authorizing a withdrawal amount that would cause the water line in the reservoir to drop below its minimum water level or cause the reservoir owner to be unable to release the lowest minimum flow imposed by its license.²¹⁴ Under this provision, a surface water withdrawer cannot obtain a permit to withdraw water from a licensed reservoir that would impair the operations of the reservoir. Furthermore, owners of licensed impoundments may withdraw surface water from its impoundment in an amount that has been reviewed and authorized under applicable federal or state laws without any consideration of reasonableness or safe

²⁰⁶ S.C. Code Ann. § 49-4-20(14).

²⁰⁷ *Id.*

²⁰⁸ *Id.*

²⁰⁹ *Id.*

²¹⁰ *Id.*

²¹¹ S.C. Code Ann. § 49-4-150(3).

²¹² S.C. Code Ann. § 49-4-150(3).

²¹³ See section concerning 401 Water Quality Certifications, *supra*.

²¹⁴ S.C. Code Ann. § 49-4-150(4).

yield.²¹⁵ In other words, this provision allows owners of impoundments licensed by the FERC for hydropower generation, such as Santee Cooper, Duke Energy and South Carolina Electric & Gas, to obtain a surface water withdrawal permit in an amount equal to the maximum amount authorized by its FERC license. Presumably, withdrawals contemplated under this provision would be used for thermoelectric or nuclear power generation, since hydropower uses are exempt from the permitting requirements of the Act.

The Act's requirements vary according to the type of water withdrawer. The Act creates the following categories of water withdrawers:

1. use of water for hydropower purposes;
2. use of water for agricultural purposes;
3. water uses that are consumptive; and
4. water uses that are non-consumptive.

The Act also distinguishes between surface water withdrawals that existed before the effective date of the Act, and those new surface water withdrawals that will occur after the effective date of the Act.

For withdrawals used for hydropower purposes, the surface water withdrawer is only required to register the amount of water withdrawn on an annual basis.²¹⁶

For withdrawals used for agricultural purposes, the surface water withdrawer is only required to register the amount of water withdrawn.²¹⁷ An existing agricultural withdrawal is allowed to maintain withdrawals at its highest reported level or at the design capacity of the water intake structure.²¹⁸ For agricultural withdrawals proposed after the effective date of the Act, the proposed withdrawer must submit to DHEC its anticipated quantity to be withdrawn for DHEC's determination of whether the proposed quantity is within the safe yield of the water body.²¹⁹ The first year of withdrawals made by these new withdrawers is subject to DHEC's determination that the proposed amount is within the safe yield of the water body.²²⁰ After this first year, new agricultural withdrawals are authorized to withdraw up to DHEC's authorized amount and need only report the amount withdrawn on annual basis.²²¹ DHEC may modify, withdraw, suspend or revoke a registration if the withdrawals are in an amount substantially higher than the

²¹⁵ S.C. Code Ann. § 49-4-45(A)(1).

²¹⁶ S.C. Code Ann. § 49-4-30(B).

²¹⁷ S.C. Code Ann. § 49-4-20(23).

²¹⁸ S.C. Code Ann. § 49-4-35(B).

²¹⁹ *Id.* at (B).

²²⁰ *Id.*

²²¹ *Id.*

registered amount and these withdrawals cause detrimental effects to the environment or human health.²²²

For non-consumptive water uses, the withdrawer is entitled to a permit, and the permit application need only provide enough information necessary for DHEC to determine that the proposed withdrawal will cause little or no change in water quantity.²²³ “Non-consumptive use” is defined as a “use of surface water withdrawn in such a manner that it is returned to its waters of origin within the boundaries of contiguous property owned by the surface water withdrawer with no or minimal changes in water quantity.”²²⁴ Non-consumptive uses are generally made by industrial water users who use water to process chemicals or paper or other processes that do not produce heat. A permit for non-consumptive use is only required to report the quantity of water withdrawn on an annual basis.²²⁵

For consumptive water uses, the withdrawer is required to obtain a permit. A *consumptive water use* is that which does not meet the definition of non-consumptive use, i.e., less water is returned to the water body than was withdrawn. Water withdrawn for cooling purposes, such as electric, thermoelectric and nuclear power generation, is a common consumptive use. The Act sets forth different rules for existing and new consumptive surface water withdrawals.

For existing consumptive uses, DHEC must issue a permit in an amount that is the greatest of the following:

1. its documented historical water use;
2. current permitted treatment capacity;
3. design capacity of the water intake;
4. an amount necessary to pay for outstanding bond issues through sale of surface water; or
5. for public water utilities that own their water supply reservoirs, the safe yield of that reservoir.²²⁶

Maintenance of minimum instream flows is not a limiting factor in issuing permits in the above amounts for existing consumptive surface water withdrawers.

For new consumptive water withdrawals and for existing consumptive withdrawers seeking more water than the Act’s automatic allowances, DHEC must issue a permit

²²² *Id.* at (E).

²²³ S.C. Code Ann. § 49-4-40(A).

²²⁴ S.C. Code Ann. § 49-4-20(16).

²²⁵ S.C. Code Ann. § 49-4-40(B).

²²⁶ S.C. Code Ann. § 49-4-70(B)(1).

if it deems the amount of surface water requested to be reasonable.²²⁷ In its determination of reasonableness, DHEC must consider the following criteria:

1. the minimum instream flow or minimum water level and the safe yield for the surface water at the location of the proposed surface water withdrawal;
2. the anticipated effect of the applicant's proposed use on existing users of the same surface water, including, but not limited to present agricultural, municipal, industrial, electrical generation and instream users;
3. the reasonably foreseeable future water need for the surface water, including, but not limited to reasonably foreseeable agricultural, municipal, industrial, electrical generation, and instream uses;
4. whether it is reasonably foreseeable that the applicant's proposed withdrawals would result in a significant, detrimental impact on navigation, fish and wildlife or recreation;
5. the applicant's reasonably foreseeable future water needs from that surface water;
6. the beneficial impact on the State and its political subdivisions from a proposed withdrawal;
7. the impact of the applicable industry standard on the efficient use of water, if followed by the applicant;
8. the anticipated effect of the applicant's proposed use on:
 - a. interstate and intrastate water use if the permit is granted;
 - b. likelihood of significant detrimental impact of a proposed withdrawal on navigation, fish and wildlife habitat, or recreation;
 - c. public health and welfare;
 - d. economic development and the economy of the state; and
 - e. applicable federal laws and interstate agreements and compacts;
9. any other reasonable criteria that DHEC promulgates by regulation that it considers necessary to make a final determination.²²⁸

In considering the amount of water requested for withdrawal, DHEC must determine the amount of safe yield of the surface water source. *Safe yield* is defined as "the amount of water available for withdrawal from a particular surface water source in excess of the minimum instream flow or minimum water level for that surface water source."²²⁹

²²⁷ S.C. Code Ann. § 49-4-80(B).

²²⁸ S.C. Code Ann. § 49-4-80(B).

²²⁹ S.C. Code Ann. § 49-4-20(25).

The safe yield “is determined by comparing the natural and artificial replenishment of the surface water to the existing or planned consumptive and non-consumptive uses.”²³⁰ If the requested amount of water exceeds the safe yield, DHEC must determine the amount of supplemental water needed to sustain the proposed water use. Supplemental water must be obtained from a source other than the source of

the requested withdrawal, such as groundwater or another water supplier. The applicant must be notified of any inadequacy in stream flow to meet the requested withdrawal amount, and the amount of supplemental water needed. The applicant is required to obtain supplemental water in order for the permit to issue.

Permittees are required to prepare and maintain an operational and contingency plan to assure an adequate water supply from the surface water source during times of drought or other low flow events.²³¹ This plan is an enforceable part of the permit and controls surface water withdrawals during times when the actual flow of the surface water is below the minimum instream flow established by the Act.²³² For an existing surface water withdrawer, this plan need only meet “appropriate industry standards for water conservation.”²³³

DHEC is required to provide public notice of all new permit applications, or applications by an existing surface water withdrawer to significantly increase withdrawals.²³⁴ Public notice must be published in a newspaper of statewide circulation and in a local newspaper in the affected area.²³⁵ DHEC must hold a public hearing regarding the withdrawal application if 20 citizens or residents of the affected area make such a request within 30 days from the public notice.²³⁶ The hearing must be held within 90 days near the specific site from the proposed surface water withdrawals. Permits issued to existing surface water withdrawers are not subject to this public notice requirement.

All surface water withdrawals approved by DHEC are presumed to be reasonable.²³⁷ Surface water withdrawers who hold a permit or who have registered under the Act are not liable for any damages suffered by another as a direct result of the permitted or registered withdrawals unless the withdrawer has violated the permit or registration.²³⁸ Table IV presents a list of permittees in the water basins of South Carolina.

²³⁰ *Id.*

²³¹ S.C. Code Ann. § 49-4-160(A).

²³² *Id.*

²³³ S.C. Code Ann. § 49-4-70(B)(2).

²³⁴ S.C. Code Ann. § 49-4-80(K)(1).

²³⁵ *Id.*

²³⁶ S.C. Code Ann. § 49-4-80(K)(1).

²³⁷ S.C. Code Ann. § 49-4-110(B).

²³⁸ *Id.*

Table IV. Interbasin Transfer Permits and Registrations

Permittee	Volume (MGD)	Losing Basin	Receiving Basin	Permit Expires
City of Aiken	8.0	Edisto River	Lower Savannah River	July 1, 2025
Anderson County Water Sys.	4.0	Upper Savannah River	Saluda River	May-16, 2017
Town of Batesburg-Leesville	2.5	Edisto River	Saluda River	Nov-13, 2025
City of Clinton	6.0	Broad River	Saluda River	Nov-13, 2025
Chester Metropolitan Dist.	7.2	Catawba-Wateree River	Broad River	Nov-13, 2025
Easley Combined Util. Sys.		Saluda River	Upper Savannah River	
Edgefield County WSA	5.9	Upper Savannah River	Edisto River	July 1, 2025
Grand Strand WSA	6.2	Waccamaw River	Little Pee Dee River	Oct-10, 2011
Greenwood CPW	30.0	Saluda River	Upper Savannah River	July 12, 2009
Lake Marion Regional Water	20.0	Lower Santee	Edisto, Black, Combahee-Coosawatchie	July 1, 2025
Lancaster County WSA	20.0	Catawba-Wateree River	Lynches and Pee Dee River	
City of Newberry/	8.0	Saluda River	Broad River & Lower Savannah	June 5, 2016
Saluda County WSA	12.0	Saluda River	Lower Savannah and Edisto River	July 1, 2025
Spring Valley Country Club	4MG/30 days	Broad River	Congaree River	July 31, 2007
City of West Columbia/	12.0 - 48.0	Saluda River	Congaree and Edisto River	
City of York	3.0	Broad River	Catawba-Wateree River	Aug-29, 2008
Town of Winnsboro	3.1	Broad River	Catawba-Wateree River	Nov 13, 2025
Columbia Hydro	3878.0	Broad River	Congaree River	Nov 13, 2025
Belton-Honea Path WA	4.0	Saluda River	Upper Savannah River	Aug-16, 2026
City of Columbia	125.0	Broad River	Congaree River, Saluda River	Aug 29, 2028
	125.0	Saluda River	Broad River Basin, Congaree River	
Beaufort Jasper WSA	60.0	Savannah River	Combahee-Coosawatchie River	Nov 13, 2015
Charleston CPW	100.0	Edisto River	Ashley- Cooper River	Jan 1, -2022
Greenville WS	32.0	Table Rock Res.(Saluda RB)	Broad River	Sept 1, 2016
	60.0	North Saluda Res.(Saluda RB)	Broad River	
	150.0	Savannah River	Saluda River	
International Paper	65.0			

Courtesy of DHEC by Shawn Clark 2010

Existing permits for interbasin transfers remain effective after the effective date of the Act.²³⁹ Upon expiration of an existing permit for an interbasin transfer, the surface water withdrawer must obtain a permit under the criteria of the Act applicable to existing surface water withdrawers making consumptive use of water.²⁴⁰ However, if the existing interbasin transfer permit expires within three years from January 1, 2011, the permit must be renewed for a quantity at least equal to the permitted quantity in the expired permit.²⁴¹ New permit applications for

²³⁹ S.C. Code Ann. § 49-4-70(C).

²⁴⁰ *Id.* See also S.C. Attorney General Opinion dated January 10, 2011 to Senator Hayes.

²⁴¹ *Id.*

interbasin transfers must be publicly noticed, and DHEC is required to hold a public hearing.²⁴²

Permits are valid for a term that represents the economic life of any capital investments made by the permittee necessary to carry out the permittee's use of the withdrawn water.²⁴³ As a general rule, permits must be issued for a minimum of 20 years, and DHEC possesses discretion to issue a permit for a term longer than 20 years if circumstances warrant, not to exceed 40 years.²⁴⁴ For existing surface water withdrawers, DHEC must issue an initial permit for at least 30 years, or longer if deemed reasonable, not to exceed 40 years.²⁴⁵ For a public water provider, permits may be issued for any additional period necessary, up to 50 years, in order to pay off revenue bonds backed by water fees.²⁴⁶

DHEC may modify, suspend or revoke a permit if a permittee fails to comply with the terms of the permit, obtains a permit through misrepresentation or failure to disclose a material fact in the application, or ceases to withdraw water for at least 36 consecutive months, or a permanent change in natural conditions occurs that endangers human health or the environment.²⁴⁷ Surface water permits can only be transferred with prior written consent from DHEC.²⁴⁸

Specific Statutory Grant of Surface Water Use

Under S.C. Code Ann. § 49-1-80, International Paper (IP) enjoys a statutory grant to divert 100 CFS (CFS: one cubic foot of water per second) of water per day from the Pee Dee River under the following conditions:

1. obtains necessary easements for the canal carrying the water from the Pee Dee to its plant in Georgetown.
2. The total amount of water taken out of the Pee Dee by IP and other entities or persons who also acquired rights-of-way to the canal shall not exceed eight percent of the flow at the point of diversion.
3. IP is subject to lawsuits for damages caused by the diversion.
4. IP has no legal or equitable recourse against any other water user unless that user is violating laws or regulations concerning water quality or control.
5. Riparian owners on the Pee Dee continue to have the right to withdraw water for irrigation and other agricultural purposes.

²⁴² S.C. Code Ann. § 49-4-90(A).

²⁴³ S.C. Code Ann. § 49-4-100(B).

²⁴⁴ *Id.*

²⁴⁵ *Id.*

²⁴⁶ *Id.*

²⁴⁷ S.C. Code Ann. § 49-4-120(A).

²⁴⁸ S.C. Code Ann. § 49-4-120(B).

Any other person, corporation, municipality or county who acquires rights-of-way for the canal also acquires the same right of diversion granted to IP and is subject to the same conditions listed above.²⁴⁹

International Paper currently withdraws 65 million gallons per day (MGD) from the Pee Dee River and transports this water by canal to its plant in Georgetown County. After the water is used and treated, IP discharges it into the Sampit River within the Waccamaw River basin. IP shares the 65 MGD with the city of Georgetown and Georgetown Steel. International Paper has obtained an interbasin transfer permit for this withdrawal.

Withdrawal of Groundwater

The South Carolina Groundwater Use and Reporting Act (Groundwater Act) imposes varying degrees of regulation upon groundwater withdrawers, defined as “a person withdrawing groundwater in excess of three million gallons during any one month from a single well or from multiple wells under common ownership within a one-mile radius from any one existing or proposed well.”²⁵⁰

Pursuant to the Groundwater Act, all groundwater withdrawers are required to register with DHEC and report the quantity of groundwater withdrawn annually.²⁵¹ DHEC is authorized to establish capacity use areas where excessive groundwater withdrawal poses adverse effects or threats to natural resources, the integrity of the aquifer, or the public health and safety.²⁵² DHEC, local governments, other government agencies, or groundwater withdrawers may initiate the process to designate a capacity use area.²⁵³ After notice and public hearing of initiation of the capacity use area designation, DHEC must coordinate with affected governmental bodies and groundwater withdrawers to develop a groundwater management plan.²⁵⁴ Thereafter, groundwater withdrawers in the capacity use area must apply to DHEC for a permit to construct wells and withdraw groundwater, and DHEC must issue permits in accordance with the plan.²⁵⁵ In reviewing permit applications, DHEC must consider “the relative importance and necessity of uses claimed by permit holders and permit applicants, or of the water use of the area, and the extent of injury or detriment caused or reasonably expected to be caused to other water uses, including public use.”²⁵⁶

²⁴⁹ S.C. Code Ann. § 49-1-90.

²⁵⁰ S.C. Code Ann. § 49-5-30(12).

²⁵¹ S.C. Code Ann. § 49-5-80(A).

²⁵² S.C. Code Ann. § 49-5-60(A).

²⁵³ *Id.*

²⁵⁴ S.C. Code Ann. § 49-5-60(B).

²⁵⁵ S.C. Code Ann. § 49-5-60(B) and (C).

²⁵⁶ S.C. Code Reg. 61-113(F)(1)(g).

Regulations promulgated pursuant to the Groundwater Act incorporate elements of reasonable use, stating that DHEC may issue a permit when the applicant has demonstrated that the groundwater withdrawal “is reasonable and necessary to meet the applicant’s requirements and where there are no unreasonable adverse affects on other water users.”²⁵⁷ However, nothing in the Act or its regulations expressly states that issuance of a permit for a certain amount of groundwater withdrawal confers upon the permittee any protection against a cause of action based on unreasonable use.²⁵⁸

Permits are issued for five-year terms or longer, if DHEC finds that a longer term “is necessary to conserve and protect the resource, prevent waste, and to provide and maintain conditions which are conducive to the development and use of water resources.”²⁵⁹

Currently, there are four capacity use areas established in South Carolina: the Waccamaw Capacity Use Area includes Horry and Georgetown Counties; the Low Country Capacity Use Area includes Beaufort, Colleton, Jasper and Hampton Counties; the Trident Capacity Use Area includes Charleston, Berkeley and Dorchester Counties; the Pee Dee Capacity Use Area includes Marion, Dillon, Marlboro, Florence, Williamsburg and Darlington Counties. In areas outside of a capacity use area but within the coastal plain, a groundwater withdrawer must notify DHEC of its intent to construct a new well or increase the rated capacity of an existing well at least 30 days before initiating such action.²⁶⁰

Emergency withdrawals of groundwater, withdrawal for non-consumptive uses, withdrawal for wildlife habitat management, and withdrawal for a single-family residence or household for noncommercial use are exempted from the Act.²⁶¹ Aquifer storage and recovery wells are also exempt from the Groundwater Act if the withdrawer already possesses a permit in accordance with the Underground Injection Control Regulations, or the amount of water withdrawn does not exceed the amount of water injected.²⁶² Dewatering operations, replacement of an existing well, and wells constructed with an open hole in a crystalline bedrock aquifer in the coastal plain are exempt from permitting and notification requirements.²⁶³

²⁵⁷ *Id.* at (F)(2).

²⁵⁸ Compare with the S.C. Surface Water Withdrawal and Reporting Act, § 49-4-110, stating that a permit to withdraw surface water gives the permittee a right to withdraw surface water pursuant to the terms of the permit, and that the amount of water withdrawal permitted is presumed to be reasonable.

²⁵⁹ S.C. Code Reg. 61-113(H)(1). Additionally, a temporary permit may be issued for up to 180 days or until DHEC renders a final decision on an application if an imminent hazard to public health exists or the applicant shows physical or financial damage has occurred or will occur if a temporary permit is not issued. S.C. Code Reg. 61-113(F)(4).

²⁶⁰ S.C. Code Ann. § 49-5-50(B).

²⁶¹ S.C. Code Ann. § 49-5-70(A).

²⁶² S.C. Code Ann. § 49-5-70(C).

²⁶³ S.C. Code Ann. § 49-5-70(B).

Use of Water During Drought

The South Carolina Drought Response Act creates a structure by which drought conditions are monitored and managed.²⁶⁴ At the local level, municipalities and counties must develop and adopt a drought response ordinance or plan that is consistent with a state drought response plan and a model drought response ordinance established by the South Carolina Department of Natural Resources (DNR).²⁶⁵ Water providers that are a public water system, yet are not a municipality or political subdivision of the state, are only required to adopt a drought response plan.²⁶⁶ The ordinance or plan applies to nonessential water uses.²⁶⁷ Nonessential water use is any use not deemed to be essential.²⁶⁸ “Water used strictly for firefighting purposes, health and medical purposes, agricultural operations for food production, minimum stream flow requirements, minimum water levels in the potable drinking water supplies and the above or below groundwater tables, and the use of water to satisfy federal, state, or local public health and safety requirements are considered essential water use.”²⁶⁹

At a minimum, a drought response plan or ordinance must include a description of alternate water supply sources and a water use reduction plan and schedule for moderate, severe and extreme drought.²⁷⁰ DNR’s model ordinance provides that its requirements take effect when the water provider issues a proclamation stating that drought conditions prevent fulfillment of the usual water use demands. DNR’s model ordinance specifies actions to be taken to reduce water consumption during a moderate, severe or extreme drought.

On the state level, the Drought Response Act creates a Drought Response Committee (Committee) that works with DNR in coordinating and planning drought response.²⁷¹ DNR provides drought data to the Committee and consults with the Committee in determining the level of drought as indicated by the data.²⁷² The level of drought is categorized into incipient, moderate, severe and extreme.²⁷³ Each drought phase is defined according to specific drought indices.²⁷⁴ The Committee “shall evaluate drought conditions to determine if a need exists for action beyond the scope of local government.”²⁷⁵ Should the Committee find that additional

²⁶⁴ S.C. Code Ann. § 49-23-10 *et seq.*

²⁶⁵ S.C. Code Ann. § 49-23-90.

²⁶⁶ *Id.*

²⁶⁷ S.C. Code Regs. 121-11.12(B)(2)(b).

²⁶⁸ 29 S.C. Code Regs. 121-11.2(S).

²⁶⁹ *Id.*

²⁷⁰ 29 S.C. Code Regs. 121-11.12(B)(2).

²⁷¹ S.C. Code Ann. § 49-23-60(A).

²⁷² S.C. Code Ann. § 49-23-50(c).

²⁷³ 29 S.C. Code Regs. 121-11.8(A).

²⁷⁴ *Id.*

²⁷⁵ 29 S.C. Code Regs. 121-11.6(B).

measures are needed, it must provide recommendations for action to DNR for implementation.²⁷⁶

During periods of severe or extreme drought, DNR is authorized to mandate curtailment of nonessential water uses so long as the Drought Response Committee finds curtailment to be reasonably necessary to protect water supply.²⁷⁷ The State Drought Response Committee must determine which nonessential uses will be curtailed according to specified standards. A declaration curtailing specified nonessential uses remains in effect for as long as reasonably required and can only be terminated by a notice of termination from the State Drought Response Committee or DNR. If the State Drought Response Committee determines that the severity of a drought threatens public health and safety, it must present the Governor with a priority list of recommended actions for alleviating the effect of the drought.²⁷⁸ The governor may declare a drought emergency and issue proclamations and emergency regulations requiring curtailment of any water uses or to allocate water on an equitable basis.

DNR may “consult and cooperate with federal agencies and agencies of the states of Georgia and North Carolina in carrying out its responsibilities under [the Act].”²⁷⁹

WATER RESOURCE PLANNING

In 1982, Governor Richard Riley called attention to the need to better protect South Carolina’s water resources by establishing a State Water Law Review Committee to evaluate the ability of state water laws to prevent economic and social disruption during times of drought.²⁸⁰ The Water Committee’s recommendations included adoption of legislation that establishes surface water and ground water as held in public trust. In 1983, Governor Riley called for further research, study and policy development concerning drought planning and management, maintenance of minimum instream flows, the need for interbasin transfers and other issues.²⁸¹

DNR²⁸² published its first State Water Assessment in 1983 that provided an overview of the status of water in South Carolina, including quantity, quality, use and

²⁷⁶ *Id.* at (C).

²⁷⁷ S.C. Code Ann. § 49-23-70(C).

²⁷⁸ S.C. Code Ann. § 49-23-80.

²⁷⁹ S.C. Code Ann. § 49-23-60(C).

²⁸⁰ Governor Richard W. Riley, Message to the 105th South Carolina General Assembly: Natural Resources and the Environment – Preparing the Land of our Children (Feb. 10, 1983), available at: <http://scwaterlaw.sc.gov/Rileyz-rpt.pdf>.

²⁸¹ *Id.*

²⁸² At the time, the Water Resources Commission was charged with this responsibility. In 1993, the Commission was merged into a newly formed Department of Natural Resources.

availability. The State Water Assessment serves as the foundation from which state water policy can be developed. In 1985, DNR, in conjunction with the Strom Thurmond Institute of Clemson University, initiated a five-year study of South Carolina water policy issues. In 1986, a severe drought focused attention on lessons learned from that drought, and what the state lacked in terms of water planning and management. During this time, DNR's water resources study identified the need for institutions that allocate water efficiently as the greatest challenge facing South Carolina.²⁸³ Policy reports in 1987 focused on the potential need for interbasin transfers to deliver water to areas of the State experiencing scarcity, but also the difficulties in administering interbasin transfers equitably.²⁸⁴ Further, South Carolina leaders raised concerns about the capacity of public water systems to meet future water demand, and do so efficiently, from both a management and financial standpoint.²⁸⁵ These studies and reports led to significant water resources legislation in South Carolina, including amendments to the Groundwater Use and Reporting Act, adoption of a Surface Water Use and Reporting Act, and adoption of an Interbasin Transfer Act. DNR developed a State Water Plan in 1998 for the purpose of establishing guidelines for the effective management of the state's water resources.

In reaction to a severe drought from 1998 through 2002, Governor Mark Sanford established another State Water Law Committee to advise the Governor about initiatives needed to preserve, maintain, and manage the water resources of this state to ensure available and affordable quantities and qualities of water for present and future multiple uses." Published in 2004, the Governor's Water Law Committee focused attention on the need for proactive efforts to manage interstate rivers with our neighboring states of Georgia and North Carolina, with the goal of negotiating interstate water compacts that allocate waters between the states.²⁸⁶

In order to successfully negotiate and enforce interstate water compacts, the Water Law Committee concluded that the state needed to enact a surface water permitting system so that a compact may be enforceable.²⁸⁷ To address the issues of both intrastate and interstate water resource management, the Water Law Committee urged South Carolina legislators to enact a comprehensive surface water permitting scheme.²⁸⁸ The Committee also urged the state to actively engage in hydropower relicensing affecting South Carolina's rivers and lakes. In 2004, DNR revised its

²⁸³ Strom Thurmond Institute, *The Situation and Outlook for Water Resource Use in South Carolina 1985-2000*, Second Year Report, p. 3 (Jan. 1987).

²⁸⁴ *Id.* at 4-5.

²⁸⁵ *Id.* at 2-3.

²⁸⁶ *Id.* at p. 19-25.

²⁸⁷ *Id.* at 15.

²⁸⁸ Governor Sanford's Water Law Review Committee, *Water Law Report*, p. 12-18 (Jan. 2004) (available at: http://scwaterlaw.sc.gov/Governors%20W%20L%20R%20%20Report%20revised4_27.pdf).

State Water Plan in part to address the lessons learned during this latest iteration of drought.

In 2009, DNR published a second edition of its State Water Assessment. A third edition of the State Water Plan is expected to be published in 2011.

Water Efficiency in the Southeast

In 2008, the organization American Rivers published “Hidden Reservoir: Why water efficiency is the best solution for the Southeast.”²⁸⁹ This report advances arguments for the potential of water efficiency to provide a new source of water supply. By improving how we use and manage water, we can tap a new source of supply that’s been hiding in plain sight.²⁹⁰ Water efficiency accomplishes more with less by using the best available technology and using water in smarter and more innovative conservation that, while also important, is generally more focused on changing behavior and habits.²⁹¹

The report outlines nine proven, timely and cost-effective policies that state and local governments and utilities can embrace now to invest in water efficiency as a primary source of new water supply.²⁹² The policy topics include:

1. Stop Leaks,
2. Price Water Right,
3. Meter all users,
4. Retrofit All Buildings,
5. Landscape to Minimize Water Waste,
6. Increase Public Understanding,
7. Build Smart for the Future,
8. Return Water to the River,
9. Involve Water Users in the Decisions.

The report argues that when southeastern states adopt effective water conservation and efficiency plans and achieve water efficiency, citizens of the southeast will enjoy a sustainable future that includes healthy communities, a strong economy and healthy rivers.

In 2010, the University of North Carolina School of Government Environmental Finance Center developed the Sustainable Urban Water Use Model, underwritten by

²⁸⁹ http://www.americanrivers.org/assets/pdfs/reports-and-publications/SE_Water_Efficiency_Oct_2008_opt3534.pdf page 10

²⁹⁰ *Id.*

²⁹¹ *Id.*

²⁹² *Id.*

the RBC (Royal Bank of Canada) Blue Water Project.²⁹³ The Model's purpose is to engage leaders in the southeast to integrate water conservation into the water utility business. Water conservation planning will maximize benefits in terms of a diversified water resource portfolio, cost effectiveness, and customer service, as well as accruing environmental and political benefits. Conservation planning will help to meet regulatory requirements and offer eligibility for federal and state grant funding.²⁹⁴

Other benefits of the Sustainable Urban Water Use Model include reduction of: sewer system failures; water contamination caused by polluted runoff from over-irrigating yards and agricultural lands; the need to construct additional dams and reservoirs or construct additional water and wastewater treatment facilities; surface water withdrawals that degrade habitat both in streams and on land close to streams and lakes; storm water runoff. In addition, water conservation planning would allow water to flow to healthier natural pollution filters (e.g., wetlands) while saving energy for the utility and the customers.²⁹⁵

Water utilities face the conservation conundrum when trying to implement the Sustainable Urban Water Use Model: In encouraging water conservation by selling less water, utilities have to increase rates to cover their costs. Customers are essentially being asked to pay more for less water.²⁹⁶

Recommended resources for water conservation measures and options include: Alliance for Water Efficiency Resource Library, American Water Works Association's Water Efficiency Clearinghouse, EPA's Water Conservation Plan Guidelines (Water Sense), California Urban Water Conservation Council Best Management Practices, Amy Vickers' Handbook of Water Use and Conservation.²⁹⁷

Georgia Water Plan and Basin Plans

The Georgia legislature passed the Comprehensive State-wide Water Management Planning Act in 2004-5 (2004 Water Act) requiring a statewide management plan, the development of regional water planning and the creation of the Water Council. The Water Council has eight members from state agencies including two from the Georgia Department of Natural Resources (GADNR), two members from each of the branches of the Georgia General Assembly, and two members who are not in the Georgia legislature but are appointed by the House and Senate respectively. In 2008, the Environmental Protection Division (EPD) of the GADNR finalized the

²⁹³ <http://bluewater.rbc.com/>

²⁹⁴ <http://www.efc.unc.edu/training/2010/WaterEfficiencyInBusinessModel.pdf> Page 4

²⁹⁵ *Id.* Page 6

²⁹⁶ *Id.* Page 21

²⁹⁷ *Id.* Page 15

Georgia State-wide Comprehensive Water Management Plan (State Plan), which was approved by the Water Council and approved by the Georgia legislature. Any changes to the State Plan must be approved by the Water Council and authorized by the legislature.²⁹⁸

The State Plan lays out four steps to begin working on a statewide framework of regulation. The first step was for the EPD to complete a water resource assessment to see the supply and pollution assimilation capacities of the river basin by region. These assessments were distributed to regional water planning councils and combined with local economic and social data to forecast regional water needs. The third step, in which regional councils work to develop regional water management plans, is currently in the process of being completed. Finally these regional plans will be adopted and acted upon both by regional users and the EPD, which will base permitting off of the regional plans. These plans are not intended to address emergencies or extreme conditions, including droughts.²⁹⁹

As the 2004 Water Act required regional level contributions to water management, Georgia divided its river basins into regions and put these under the control of regional water councils. Regional water councils are set up such that their members will represent a wide variety of water uses in the area. The regional councils have no more than 25 members with the balance of representation determined by the Governor or Lieutenant Governor.³⁰⁰

Each regional council signs a Memorandum of Agreement (MOA) with the EPD and the Georgia Department of Community Affairs (DCA). The MOA requires that the regional councils submit Water Development and Conservation Plans (WDCP) based on EPD and a regional contractor's data, involve the public, and work with other regional councils that are hydrologically-connected and coordinate with EPD on planning. The EPD is required to provide technical assistance and planning documents, monitor water resources in the basin and consistently update the data, review and adopt the WDCP if it is in compliance. The DCA will provide land use planning information and coordinate between the WDCP goals and local governments' or regional commissions' comprehensive plans.³⁰¹

The regional councils will use the water resource assessment for their region and 10-, 20-, 30- and 40-year forecasts for water usage to create the WDCPs. For councils that are hydrologically connected, the regional councils are responsible for coordinating shared resources. After the plans are developed, a draft of the WDCP is to be sent to the EPD for approval. Once approved, the EPD will consult with the WDCP when making permitting decisions and grants or loans for water projects will be guided by the plan. The WDCP's will be reviewed and revised as needed or every

²⁹⁸ http://sogweb.sog.unc.edu/Water/images/f/f7/Combined_2010_WAS_reportv2.0.pdf Page 17

²⁹⁹ *Id.* Page 17

³⁰⁰ *Id.* Page 17

³⁰¹ *Id.* Page 17

five years. One of the main goals for the WDCPs is to close current and avoid future gaps in water needs either through conservation or advance planning about additional supplies.³⁰²

Each of the regional councils has a fact sheet that discusses who is on the council, where the regional area is located, the key issues for the area, and the current water use for the area. Most of the legwork for each of the regional councils is done by the EPD and its various contractors, which include many engineering and consulting firms from Georgia and elsewhere. EPD has primary responsibility for ultimate decision making about water allocation.

It is still premature to assess the value of the Georgia Water Plan, relative to its cost. The state has committed to spending upwards of \$30 million on its planning effort over the three years 2009, 2010 and 2011. What the principal investigators of the Water Allocation Study observed in their trips to Georgia, however, was an admirably high level of involvement of state and regional leaders in evaluating their water supply challenges. If nothing else, the Georgia process has greatly raised the level of understanding of water resources issues in the ranks of local leaders and elected officials, outside of the realm of water professionals, who are already attuned to these matters.³⁰³

North Carolina Water Allocation Plan

Until 2010, the only North Carolina statute that directly regulated withdrawals was the Water Use Act of 1967 (Capacity Use Area). The Water Use Act of 1967, G.S. 143-215.11 through .22, provides for the designation by the Environmental Management Commission of capacity use areas, areas in which the supply of water (surface and/or groundwater) is insufficient to meet demand. Water withdrawals in capacity use areas require coordination and regulation, in order to protect the interests and rights of residents and property owners and the public interest.

In 2007, a Water Allocation Study was begun by the General Assembly's Environmental Review Commission in response to the need for review of state and regional water allocation law and policy. The study was triggered by severe conflict over a proposed interbasin transfer of water, and the historic droughts of 2002-2004 and 2006-2007. The research team submitted a comprehensive report and findings and made recommendations in 2008-2009. North Carolina had five major water bills based on the recommendations that were ratified in 2010.

Improve River Basin Modeling

³⁰² *Id.* Page 18

³⁰³ *Id.* Page 18

SL 2010-143, enacted in July 2010, requires the North Carolina Department of Environment Natural Resource (DENR) to develop hydrologic models for all river basins. The hydrologic models must incorporate surface/groundwater resources in each basin, ecological and in-stream flow requirements, withdrawals, discharges and local water supply data, and projections of future withdrawals. Models must predict inadequate yield to meet all needs, inadequate yield to meet all essential water needs, and adverse effects on ecological flows. The 2010 legislation on river basin modeling in North Carolina specifically directed DENR, including the Environmental Management Commission and a newly created Science Advisory Board, to work out an approach to the modeling of ecological flows in the state. Science Advisory Board members must have expertise in aquatic ecology. The River Basin Modeling is required to include interstate cooperation to the extent practicable. Hydrologic models have to be approved by state Environmental Management Commission and include a 60-day public comment period. DENR is required to report annually to the General Assembly.³⁰⁴

As part of River Basin Modeling, water infrastructure needs are reviewed. DENR, along with interested parties, develops statewide surveys to supplement information in EPA water and wastewaters needs assessment, as well as develops a plan to incorporate information from North Carolina and EPA needs survey into a State Water Supply Plan. DENR makes recommendations on the Plan to consolidate information on statewide water and wastewater infrastructure needs, resources, and funding. DENR and local government commissions evaluate costs of measures to increase oversight of public systems to ensure that systems are financially sound.³⁰⁵

Modify Water Funding Priorities

SL 2010-151 adds priority criteria for regionalization and drought water conservation.³⁰⁶

Water Infrastructure Information Needs

SL 2010-144 improves the collection and utilization of water and wastewater infrastructure information.³⁰⁷

³⁰⁴ www.ncwater.org/Permits_and_Registration/EMCWACPpresentations/20100908/Legislation_2010_WAC.pdf

³⁰⁵ www.ncwater.org/Permits_and_Registration/EMCWACPpresentations/20100908/Legislation_2010_WAC.pdf

³⁰⁶ *Id.*

³⁰⁷ *Id.*

Water Supply System Capacity Planning

SL 2010-150 requires local water supply plan systems to revise plans to address future water needs when 80 percent of available water supply has been allocated or when seasonal demand exceeds 90 percent of available water supply. Projected future needs must be incorporated into the models.³⁰⁸

Conserve and Protect Agricultural Water Resources

SL 2010-149 directs the DENR and North Carolina Department of Agriculture to work with agriculture stakeholders to identify agricultural water infrastructure needs and to encourage voluntary measures to conserve and protect agricultural water resources. A cost share program has to be designed to assist farmers to implement best management practices to conserve and protect agriculture water resources.³⁰⁹

The Water-Energy Nexus

The “2006 Energy Demands on Water Resources Report to Congress on the Interdependency of Energy and Water”³¹⁰ calls for collaboration on energy and water resource planning among federal, regional, and state agencies, as well as with industry and other stakeholders.

In most regions, energy planning and water planning are done separately. The lack of collaboration on integrated energy and water planning and management has already impacted energy production in many basins and regions across the country. Mechanisms, such as regional natural resources planning groups, are needed to foster collaboration between stakeholders and regional and state water and energy planning, management, and regulatory groups and agencies. These collaborative efforts are needed to ensure proper evaluation and valuation of water resources for all needs, including energy development and generation.³¹¹

The American Council for an Energy-Efficient Economy (ACEEE) published a report entitled “South Carolina’s Energy Future” in 2009. The report names thermal or steam-driven generators powered by nuclear fission or coal combustion as the most water-intensive sources of electric power generation. In 2007 about two-thirds of the electric power generated in the United States was powered by coal 48.5 percent

³⁰⁸ *Id.*

³⁰⁹ *Id.*

³¹⁰ <http://www.sandia.gov/energy-water/docs/121-RptToCongress-EWwEIAcomments-FINAL.pdf>

³¹¹ *Id.* Page 11

and nuclear fuel 19.4 percent. Over 90 percent of the electricity generated in South Carolina in 2007 came from coal and nuclear fuel. Thus, electricity generation in South Carolina is significantly more water-intensive than that of the nation as a whole.³¹²

Energy considerations in water management decisions can lead to significant energy—and money—savings. South Carolina policymakers should better integrate energy issues into water policy decision-making. Consideration of energy and water use together may result in solutions that are not as clear in separate policy analyses of water and energy issues.³¹³ During the process of modifying its state planning tools (such as the state’s Water Plan and Water Resource Management Goals), decision makers should look at energy and water policy simultaneously and improve coordination of resource management agencies.³¹⁴ Such a coordinated process will result in sounder and more cost-effective policies.

Both water and energy policymakers should give water conservation higher priority.³¹⁵ Policy actions that affect end uses of water may have much larger energy implications than policy actions that affect the mix of physical water sources.³¹⁶ As concluded by the National Resources Defense Council, energy and water conservation have much greater potential, and stronger energy-related economic and environmental benefits, than what has been recognized to date.³¹⁷ This water-energy nexus has yet to be fully taken into account by South Carolina’s decision makers.

INTERSTATE WATER ISSUES

Issues Concerning the State of Georgia

South Carolina and Georgia have many water-related issues of mutual concern. In particular, the Savannah River, as the shared boundary between the two states, presents complicated problems requiring long-term attention in order to reach equitable resolutions. In 2004, the governors of South Carolina and Georgia each appointed Savannah River Committees to establish communication between the two states and work together to solve issues of mutual concern affecting the Savannah.³¹⁸

³¹² South Carolina’s Energy Future, ACEEE Page 7

³¹³ <http://www.nrdc.org/water/conservation/edrain/execsum.asp>

³¹⁴ *Id.*

³¹⁵ *Id.*

³¹⁶ *Id.*

³¹⁷ *Id.*

³¹⁸ Governor Sanford Exec. Order 2005-14 (filed June 21, 2005) (*available at*: <http://www.scgovernor.com/uploads/executiveorders/2005-14>)

CreatingtheGovernorsSavannahRiverCommittee.pdf]; Governor Purdue Exec. Order (filed June 21, 2005) (available at: http://www.gov.state.ga.us/ExOrders06_21_05_01.pdf).

Low Dissolved Oxygen in the Lower Savannah River

Pursuant to § 303(d) of the Clean Water Act (CWA), any water body that fails to meet a state's water quality standards must be included on an inventory of impaired waters.³¹⁹ The State or the U.S. Environmental Protection Agency (EPA) must develop a Total Maximum Daily Load (TMDL) for the pollutant causing the impairment.³²⁰ A TMDL is the calculated maximum allowable pollutant loading to a water body at which water quality standards can be met.³²¹ A TMDL is made up of two components: a load allocation and a waste load allocation. A load allocation is the portion of the receiving water's loading capacity attributed to existing or future nonpoint sources or to natural background sources. The waste load allocation is the portion of a receiving water's loading capacity allocated to an existing or future point source. Thus, a TMDL for dissolved oxygen would establish a maximum capacity for discharge of BOD from point discharges in the Savannah. This waste load allocation would then be divided among the affected NPDES dischargers.

After years of litigation, the EPA issued a TMDL in May 2010 that requires oxygen demanding substances to be reduced by 80 percent. This issue has serious implications for both states.

Groundwater Contamination

Coastal areas of Georgia, Florida and South Carolina have historically relied on the Upper Floridan Aquifer (Aquifer) to supply water for municipal and industrial use. Prior to development of the Aquifer, groundwater naturally flowed southeastward toward the Atlantic Ocean, discharging into major streams and the ocean. Because the Aquifer provides a cheap and plentiful source of water supply, the city of Savannah and nearby water-consuming industries steadily increased its pumpage to a high of approximately 85 million gallons per day (mgal/d) in Chatham County in 1990.³²² In 2000, pumping from Chatham County was approximately 68 mgal/d.³²³ In 2005, Chatham County pumped approximately 70 mgal/d from the Aquifer.³²⁴ This pumping in the Savannah area created a large cone of depression in the Aquifer under the Savannah area which has altered the natural groundwater flow, pulling water from all directions toward the wells. Further, groundwater withdrawals have

³¹⁹ 33 U.S.C. § 1314(l)(1).

³²⁰ 33 U.S.C. § 1313(1)(C).

³²¹ 40 C.F.R. § 130.2(a)(i).

³²² Dorothy F. Payne, Malek Abu Rumman & John S. Clarke, U.S. Geological Survey, Simulation of Ground-Water Flow in Coastal Georgia and Adjacent Parts of South Carolina and Florida, 12 (2005).

³²³ *Id.*

³²⁴ S.C. Department of Health & Environmental Control, STAFF REPORT TO S.C. GOVERNOR'S SAVANNAH BASIN COMMITTEE (Jan. 9, 2006).

lowered the water level of the Aquifer, reduced the Aquifer's natural discharge, and increased salt concentrations in the Aquifer.

In the 1980s, wells located on Hilton Head Island were contaminated by saltwater, rendering them unusable. In response to this serious problem, South Carolina required a 35 percent reduction in groundwater pumping on Hilton Head Island, from 15 mgal/d in 1989 to 9.77 mgal/d by the year 2000. The process of reducing groundwater usage was a painful and expensive undertaking for water utilities on the Island. Public water utilities serving Hilton Head Island and Beaufort and Jasper Counties spent approximately 90 million dollars to develop alternative water supply sources. As of 2000, all water needs in excess of 9.77 mgal/d were drawn from surface water.

In 1997, at the urging of South Carolina, Georgia instituted an Interim Strategy for Managing Saltwater Intrusion in order to stop saltwater intrusion in South Carolina before it advances further and to prevent saltwater contamination from reaching coastal Georgia. Withdrawal of water from the Upper Floridan aquifer in Chatham, Glynn, and portions of Wayne and Effingham Counties was capped at 1997 rates. Additional pumping in all 24 coastal-area counties was allowed, provided that pumpage did not exceed 36 mgal/d above 1997 rates.

Additionally, South Carolina, Georgia, major industry users, and others jointly funded the "Sound Science Initiative," a study designed to understand the saltwater movement in the Aquifer and develop strategies to halt its growth. In August 2005, the initial results of the study revealed saltwater plumes under northern Hilton Head Island, the Pinckney Island National Wildlife Refuge, and the Moss Creek Plantation area of Bluffton.³²⁵ It appears that under current pumping rates, these plumes will move toward Savannah at about 130 feet per year.³²⁶ However, DHEC's analysis of the data revealed that in the Hilton Head and Tybee Island area, saltwater from the Atlantic Ocean is also seeping downward from the Atlantic Ocean through thin areas of the confining clay layer. This downward movement of saltwater may reach the Aquifer in 50 years.

Given these questions concerning the soundness of the model and data, South Carolina and Georgia entered into a Memorandum of Agreement (MoA) in October 2007 in which the Georgia EPD and the South Carolina DHEC agreed upon a final model and management steps needed to reduce groundwater pumping from the Aquifer. The resulting final model contained the following conclusions:

³²⁵ Georgia Department of Natural Resources, Environmental Protection Division, Draft Coastal Georgia Water & Wastewater permitting Plan for Managing Salt Water Intrusion, 9 (Dec. 2005).

³²⁶ *Id.* at 13.

- If groundwater withdrawals continue at the current rates in the Savannah area or on Hilton Head Island, salt water will continue to move into the aquifer contaminating more water supply wells.
- Eliminating further saltwater intrusion or movement of existing saltwater plumes would require greater than 90 percent reduction in pumping in both the Savannah area and on Hilton Head Island.
- Eliminating all large withdrawals in the Savannah area and on Hilton Head Island would not immediately remove saltwater from the Aquifer. Saltwater would continue to exist in the Aquifer well into the future, but would begin to slowly diminish as groundwater flow reverses and discharges into Port Royal Sound.
- Groundwater withdrawals in both the Savannah area and on Hilton Head Island were needed to create the inland extent of the current saltwater plume on Hilton Head Island. The pumping in Savannah has had the greatest effect on overall plume growth beneath Port Royal Sound and southwest of the Colleton River compared to the pumping on Hilton Head Island.³²⁷

Dredging of the Savannah River Harbor

The U.S. Army Corps of Engineers is considering a plan to dredge the Savannah River harbor to a depth of 48 feet, a significant increase. Concerns about this include the potential for increased infiltration of salt water into the underlying Aquifer and increased salt content of surface waters further upstream in the harbor and river. These two direct effects would have a number of environmental consequences, including potential brackish water in fresh water intakes and intrusion of salt water into the fresh water marsh of the Savannah River Wildlife Preserve.

Issues Concerning the State of North Carolina

Catawba-Wateree and Yadkin-Pee Dee River Basins

In 2004, a bi-state commission was created by the state legislatures of South Carolina and North Carolina to provide an advisory forum for integrated management of the Catawba-Wateree and Yadkin-Pee Dee River Basins.³²⁸

In 2006 and 2007, the relationship between North Carolina and South Carolina became strained over a highly emotional and controversial request for an

³²⁷ Georgia EPD and SCHEC, Conclusions about Saltwater Intrusion into the Upper Floridan Aquifer in Coastal Georgia and South Carolina (May 2010).

³²⁸ S.C. Code Ann. § 44-59-10 *et seq.* and N.C. Gen. Stat. § 77-110 *et seq.*

interbasin transfer in North Carolina from the Catawba-Wateree River.³²⁹ As the downstream state, South Carolina complained that North Carolina's interbasin transfer would harm South Carolina during drought conditions.³³⁰ Ultimately, the Attorney General of South Carolina brought suit against North Carolina in the United States Supreme Court, seeking an equitable apportionment of the Catawba-Wateree River.³³¹ This matter has been resolved in a court-sanctioned agreement between the two states.³³² The agreement requires active cooperation between the two states and development of a Memorandum of Agreement.

The agreement is stated, in abbreviated fashion, as follows:

Parties to the Agreement: "... the South Carolina Department of Archives and History, the South Carolina Department of Natural Resources, and the South Carolina Department of Parks, Recreation and Tourism"

Agreement Items:

- A. S.C./N.C. . . ."agree . . . to regulate the use and withdrawal of water from the River Basin and to . . . require conservation . . . during . . . drought."
- B. S.C./N.C. " . . . agree to update the Catawba-Wateree River Basin Water Supply Study ("Study") every 10 years"
- C. S.C./N.C. " . . . agree . . . to coordinate with each other and implement . . . a consistent system of approving IBTs within the River Basin."
- D. S.C./N.C. " . . . agree that during periods of drought, . . . require all owners . . . to implement drought response plans which are no less stringent than the requirements of the LIP"
- E. S.C./N.C. " . . . agree to develop a Memorandum of Agreement ("MOA")"
- F. S.C./N.C. " . . . agree to dismiss the dispute in the Supreme Court"
- G. S.C./N.C. " . . . agree that . . . neither State will file an action in the Supreme Court . . . against the other"
- H. "This Agreement shall become effective on the date it is signed by all parties." ³³³

³²⁹ See website of the Catawba Riverkeeper Foundation, <http://www.catawbariverkeeper.org>, to gain a sense of the organized and angry opposition to the transfer.

³³⁰ S.C. Department of Natural Resources, *Summary of Catawba-Wateree Basin Natural Flows and the Impact of Water Transfers from that Basin in North Carolina* (May 31, 2007) (available at: <http://www.scattorneygeneral.com/currentcases/waterwar.html>).

³³¹ *South Carolina v. North Carolina*, No. 220138 (United States Supreme Court) (filed June 8, 2007) (available at: <http://www.scattorneygeneral.com/currentcases/waterwar.html>).

³³² <http://www.scag.gov/newsroom/pdf/2010/waterwarsettlement.pdf>

³³³ <http://www.scag.gov/newsroom/pdf/2010/waterwarsettlement.pdf>

Catawba-Wateree River Wasteload Allocations for Dissolved Oxygen and Phosphorus

Wasteload allocations are in development, and have been for several years, for dissolved oxygen and phosphorus in the Catawba-Wateree River Basin. Excessive phosphorus has contributed to significant eutrophication of Lake Wateree. Dissolved oxygen relates to the required level of treatment at the several municipal and industrial wastewater discharges upstream of Lake Wateree.

A tentative agreement has been reached as to operation of dams in this Basin during drought conditions, and Duke Power is generally operating per the agreement, though the agreement is as yet tentative.³³⁴

Yadkin-Pee Dee River Minimum Discharges into South Carolina

During the most recent significant drought a few years ago, there was extensive discussion among the states of North Carolina and South Carolina and water users in the basin in the two states about appropriate minimum discharges from the several dams in this River Basin, all located in North Carolina. A tentative resolution has been attained as to the technical aspects of operation through the dam licensing process of the Federal Energy Regulatory Commission (FERC). However, for the dams operated by Alcoa Corporation, the state of North Carolina is asking FERC to issue the operating licenses to the state. This is an unresolved request to FERC in the licensing process.³³⁵ Alcoa no longer operates its aluminum refining plant, which used much of the electricity from the dams. Rather, it is operating the dams as commercial sources of electricity, a significant deviation from their original purpose. Resolution of the question of the appropriate owner of the license for the dams can be expected to take considerable time, likely delaying completion of agreement for the operating changes.³³⁶ There is a Federal Court case unresolved with Alcoa asking that North Carolina's right to issue a 401 certification, delaying relicensing, be denied as the state was late in issuing the certification. This case was argued in January 2011, and a decision is expected within a few months.³³⁷

³³⁴ Andy Yasinsac by Larry Turner of the S.C. DHEC Bureau of Water. 3/5/11

³³⁵ Andy Yasinsac by Mark Hershfeld, FERC. 3/24/11

³³⁶ Andy Yasinsac by Larry Turner of the S.C. DHEC Bureau of Water. 3/5/11

³³⁷ Andy Yasinsac by Mark Hershfeld, FERC. 3/24/11

APPENDIX

Positions of the League of Women Voters on Water Resources

The League of Women Voters of the United States supports:

- water resource programs and policies that reflect the interrelationships of water quality, water quantity, ground-water and surface water and that address the potential depletion or pollution of water supplies;
- measures to reduce water pollution from direct point-source discharges and from indirect nonpoint sources;
- policies to achieve water quality essential for maintaining species populations and diversity, including measures to protect lakes, estuaries, wetlands and in-stream flows;
- stringent controls to protect the quality of current and potential drinking-water supplies, including protection of watersheds for surface supplies and of recharge areas for groundwater.

Proposed Interbasin Water Transfers

Interstate and interbasin transfers are not new or unusual. Water transfers have served municipal supplies, industry, energy development and agriculture.

Construction costs of large-scale water transfers are high, and economic losses in the basin of origin also may be high. Environmental costs of water transfers may include quantitative and qualitative changes in wetlands and related fisheries and wildlife, diminished aquifer recharge and reduced stream flows. Lowered water tables also may affect groundwater quality and cause land subsidence.

As we look to the future, water transfer decisions will need to incorporate the high costs of moving water, the limited availability of unallocated water and our still limited knowledge of impacts on the affected ecosystems.

In order to develop member understanding and agreement on proposals for large-scale water transfer projects, state and local Leagues need to work together. The following guidelines are designed to help Leagues jointly evaluate new proposals for large-scale water transfers.

The process for evaluating the suitability of new proposed interbasin water transfers should include:

- ample and effective opportunities for informed public participation in the formulation and analysis of proposed projects;

- evaluation of economic, social and environmental impacts in the basin of origin, the receiving area and any area through which the diversion must pass, so that decision makers and the public have adequate information on which to base a decision;
- examination of all short- and long-term economic costs including, but not limited to, construction, delivery, operation, maintenance and market interest rate;
- examination of alternative supply options, such as water conservation, water pricing and reclamation;
- participation and review by all affected governments;
- procedures for resolution of inter-governmental conflicts;
- accord with international treaties;
- provisions to ensure that responsibility for funding is borne primarily by the user with no federal subsidy, loan guarantees or use of the borrowing authority of the federal government, unless the proposal is determined by all affected levels of the League to be in the national interest.

The League of Women Voters of South Carolina

The League of Women Voters may advocate on any issues covered by the statement of the League of Women Voters of the United States. In addition, the LWVSC has the following positions on Natural Resources.

Natural Resources

“Promote an environment beneficial to life through the protection and wise management of natural resources in the public interest by recognizing the interrelationships of air quality, energy, land use, waste management and water resources.”

The League of Women Voters of South Carolina also supports:

1. Ensuring to the citizens of South Carolina fullest possible public participation in significant state and federal decisions relative to environmental and energy matters. This should include, but is not limited to, hearings in the state capital and in all locally affected areas.
2. Ensuring that federal facilities located in South Carolina comply with state and federal environmental laws.
3. Independent safety oversight at federal nuclear facilities.
4. Development and implementation of state solid and hazardous waste policies that protect groundwater, air quality, human health and native biota.

5. Strong and well-enforced coastal zone management laws and regulations to ensure preservation of areas of critical concern. The coastal zone should be given a greater level of legal protection.
6. SC establishing one governmental agency (or investing an existing agency) with the power to develop and implement energy policies that would give appropriate consideration to all energy-generating sources. The citizens of SC should be represented in this proposed energy policy-making agency.
7. An environmental impact process for South Carolina that would mirror the national process, promote our overarching goal as stated above and ensure the fullest possible public participation.
8. Changes in the state's natural resource agencies and overall management that would best meet the criteria established under #4 Structure of State Government position.
9. Changes in state law to remove the mandate for the Department of Health and Environmental Control (DHEC) to carry out conflicting missions: protection of public health and the environment and promotion of economic development. Similar changes should be made in the SC Atomic Energy Act.
10. Establishment of criteria for membership on the DHEC board to ensure varied expertise, representation of South Carolina's varied stakeholders, and freedom from conflict of interest.
11. Promoting land use and water resource policies that manage land and water as finite resources and that incorporate principles of stewardship and other land use planning strategies at both the state and local level.
12. Requiring state officials to incorporate environmental compliance history as criterion for awarding permits.

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