

# SAVANNAH RIVER BASIN COMPREHENSIVE WATER RESOURCES MANAGEMENT STUDY

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**Abstract.** A comprehensive water resources management study has been authorized by the 1996 Water Resources Development Act (WRDA) directing the U.S. Army Corps of Engineers to develop an updated plan addressing current and future needs in the basin, examine reallocation of storage, and to develop a better management structure to deal with basin water resources issues. The Reconnaissance Phase and development of a scope of work for the feasibility phase was completed in July and September of 1999, respectively. A Feasibility Study Cost-Sharing Agreement, defining a partnership with the states of Georgia and South Carolina, was signed in June 2000. Under this agreement, the feasibility phase is cost-shared 50 % Federal funds and 50 % combined state funds. Currently, as the states secure their cost shares, the Corps-Georgia-South Carolina team has been defining the overall study make-up, and initiating the first study actions.

## PAST BASIN EFFORTS

### Background on Prior Basin Assessments

The Savannah District, U.S. Army Corps of Engineers, completed an assessment of the water-related resources needs of the Savannah River Basin (Corps of Engineers, 1990). The major conclusion and recommendation of that study was that a comprehensive survey should be conducted on how to meet various needs through reallocating portions of storage in the multipurpose projects.

Throughout the past 100 years, the Corps of Engineers has conducted a number of studies on the water resources needs of the Savannah River Basin. In February 1987, the Corps of Engineers prepared a reconnaissance level report (Corps of Engineers,

1987), assessing the need for reallocation of storage at the three Federal reservoirs--J. Strom Thurmond, Richard B. Russell, and Hartwell. At that time, there was no identified need for specific reallocation studies.

### EPA Watershed Project

In November 1993, the Environmental Protection Agency (EPA) Region IV initiated a watershed approach effort for the Savannah River Basin. This effort is still ongoing and involves a number of basin stakeholders. The Policy Committee establishes the Project's direction. The Project in its development included several other committees including the Management Committee and six Resource Management Committees - Water Quality, Fish & Wildlife, Recreation & Cultural Resources, Water Quantity/Navigation/Hydropower, Land Use & Wetlands, and Industry & Economic Development. Each Resource Committee developed their Baseline Assessment of their assigned resource; these Baseline Assessments can be found in Volume 2 of the Management Committee's Report (EPA, 1995).

The Policy Committee, working through various action teams, has developed and is implementing a Watershed Strategy (EPA, 1997) to address the first 26 priority issues of the basin that were identified by the Management Committee (EPA, 1995). At least nine of these issues have been linked to the Corps Comprehensive Study as a possible means by which to address and hopefully resolve these issues.

The authorization for the Comprehensive Study requires that the Comprehensive Study coordinate its activities with the Watershed Project. The information developed by the various committees of the Watershed Project was used extensively in preparing the reconnaissance study and the Plan of Study for the Feasibility Phase.

## THE COMPREHENSIVE STUDY

### Early Coordination

We have been working with various groups and agencies concerning the need for a comprehensive assessment of the water resources needs of the basin and the abilities of our Federal projects to help satisfy these needs. Our biggest challenge is doing this during "peacetime," before potential conflicts result in a "Water War," such as that being waged in the Apalachicola-Chattahoochee-Flint/Alabama-Coosa-Tallapoosa river basins on the Georgia-Alabama-Florida borders. Along this line, in August of 1992, we sponsored a Savannah River Basin Issues Workshop in Augusta, Georgia, during which we invited the major stakeholders of the basin to identify what they considered the most pressing issues of the basin. This group's major issues concerned water supply, water quality, and basin management. Since July 1993, the Chief of Planning Division has met quarterly with the directors of water resources planning agencies in the State of Georgia. During these meetings, agreement has been reached on the need to pursue such a study. Since 1993, the District has participated in annual joint Corps/State of South Carolina meetings, where (along with other issues) the need for a comprehensive study of the Savannah River Basin was discussed.

### New Study Authority

Section 414 of the 1996 WRDA authorized a comprehensive study of the Savannah River Basin. Specifically the authorization states:

"(a) In General.--The Secretary shall conduct a comprehensive study to address the current and future needs for flood damage prevention and reduction, water supply, and other related water resources needs in the Savannah River Basin.

(b) Scope.--The scope of the study shall be limited to an analysis of water resources issues that fall within the traditional civil works mission of the Corps of Engineers.

(c) Coordination.--Notwithstanding subsection (b), the Secretary shall ensure that the study is coordinated with the Environmental Protection Agency and the ongoing watershed study of the Savannah River Basin by the Agency."

Working with the study cost sharing partners, the States of Georgia and South Carolina, we initiated a Reconnaissance study in February 1998. This phase,

which is Federally funded, had two main actions to determine. First, identification of the pertinent water resources issues in the basin that fell within the direction of the study authority and was within the Federal Interest to resolve in cooperation with the state partners. Second, the necessary tasks to study and resolve these issues were developed into a Project Study Plan which will be used as the basis of the Feasibility Phase.

### Basin Water Issues

Recognizing that a number of water resources issues have been identified through other efforts, the Reconnaissance Study concentrated on re-validating these issues and developing detailed study plans for them. Table 1 summarizes the issues being brought forward. A number of these issues stem from the successive droughts of the eighties which brought about new concerns over water usage of the basin. One area of concern raised was need for additional water supply. The continued, drought-induced drawdown prompted concerns about providing more stable pool levels for recreation, while causing heightened concerns over water quality in the lower Savannah River. Hydropower customers faced curtailment of power production.

The present project operations represent a balance of storages and releases which provide for hydropower generation while maintaining conservation pool levels and providing releases which meet downstream water supply and water quality needs. However, there are additional concerns we must plan to meet, including, the need for additional water supply storage for upper basin and developing downstream users, for boosting low flows during droughts, and for generating "flushing" flows for the lower river basin wetlands and bottomland hardwoods. With the redefining of the 100-year flood discharge level at Augusta, the use of flood control storage in the projects needs to be revisited.

### Relationship with EPA Watershed Study

We view the two efforts - the SRB Comprehensive Study and the EPA Watershed Study - as complementary. An important point to remember in the watershed approach is it depends on existing agency programs for funding the major efforts to be taken. During the initiation of the Comprehensive Study, the past participation in the Watershed Study accomplished much of the early issue definition needed for the Comprehensive Study. The authorization for the Savannah River Basin Comprehensive Study also requires that its results be coordinated with the EPA

Watershed Study. As such, the Comprehensive Study will be a major tool to accomplish a portion of the Watershed Study's goals and objectives. The Comprehensive Study will use the EPA Watershed Project as a major means to seek input into the study.

**Table 1. Summary of Basin Water Issues**

- **Upper Basin Needs vs. Downstream Needs**
- **Water Supply Allocations**
  - Lake Levels for Recreation/Commercial Activities
  - In-Lake reallocations
  - Downstream In-River Allocations
  - Groundwater Use-Future Coastal Supply
  - Future Demands
  - Impacts of Inter-basin Transfers
- **Flood Control**
  - Flood Control Below J. Strom Thurmond Lake
  - Storage Reduction
  - Flood Plain Mitigation
- **Hydropower**
  - Capacity & Energy
  - Regional Affects of Energy Production
  - Pumped Storage Facilities
- **Water Quality (Flows)**
  - Discharge Permits and Droughts
  - Saltwater Intrusion & DO in Savannah Harbor
- **Habitat**
  - Instream Flow Requirements
  - Wetland Impacts
  - Estuarine Issues
- **Recreation**
  - Lake Levels for Recreation/Commercial Activities
  - Regional Economic Value of Recreation
- **Aquatic Plant Control**
  - Instream

### **Current Direction**

The District initiated the Reconnaissance phase in February 1998 and after coordinating with the various state and Federal agencies, developed a suitable basin scope of studies to address the above issues, as well as new ones that may surface. The reconnaissance study was completed in July 1999. It identified the tasks that will be needed to address each issue, and it's associated cost and time. This information was then further developed into a Project Study Plan, which is the basis for the cost shared feasibility study. The Georgia and South Carolina Departments of Natural Resources are the main cost-sharing partners for the feasibility phase, and agreed to cost share in this study by entering into a Feasibility Study Cost-sharing Agreement with the Savannah District, U.S. Army Corps of Engineers on 30 June 2000

Under this agreement, the states are responsible for 50 percent of the feasibility phase, currently estimated to be \$2,000,000 of a total study cost of \$4,000,000. One half of the states' share may be in the form of in-kind services.

The study length is estimated to be four years, and is divided into two phases. The first, or preliminary phase, is based on the premise that after developing an allocation model, and defining the various stakeholders' demands on the basin system, the various demands can be met, or satisfied, by changing system operations. The second phase is based on the premise that changing operational changes alone will not meet all demands and goals of the stakeholders. The second phase begins by making in-depth data collections and studies of the various demands, and examines various re-allocation scenarios, and other alternatives to meet these demands.

One Alternative may be to increase the conservation pool by 0.5 ft. The goal will be to develop a mutually acceptable plan to most stakeholders, and recommend that plan to the United States Congress for authorization.

### **Future Direction**

Three primary tasks are underway during the Phase One portion of the study. These include deciding the type of basin allocation tools needed, collecting and developing a common set of hydrologic data to base computations on, and capturing and quantifying the various stakeholder needs and demands on the system. Once these three primary tasks are completed, various operating scenarios will be formulated and evaluated.

The first task has recently been defined. After evaluating various models that were identified during the reconnaissance study phase, the study partners have

selected using the new model suite of tools - HEC-CWIMS, developed by the Hydrologic Engineering Center in Davis, California.

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