

Draft Technical Memorandum

Prepared For: Savannah-Upper Ogeechee Water Planning Council and Georgia Environmental Protection Division

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Subject: **Management Practices Selection**
Section 6 Supplemental Document
Savannah-Upper Ogeechee Regional Water Plan

Introduction

Section 6 of the Savannah-Upper Ogeechee Regional Water Plan (Regional Water Plan)¹ briefly discusses the management practices selection process and presents the water management practices recommended by the Savannah-Upper Ogeechee Water Planning Council (Council). This Technical Memorandum provides the detailed decision-making process, including management practices selection and prioritization, that the Council followed to evaluate and select these practices. All tables referenced in the memorandum are listed at the end of the document.

Background

The Comprehensive State-wide Water Management Plan (State Water Plan) provided the primary guidance to Regional Councils on selecting recommended region-specific management practices to be included in their respective Plans. The State Water Plan categorizes the management practices based water quantity issues (demand, return, and supply) and water quality issues (enhanced water quality standards/monitoring and enhanced pollution management). In addition, the Georgia Environmental Protection Division (EPD) provided the following guidance documents throughout the planning process:

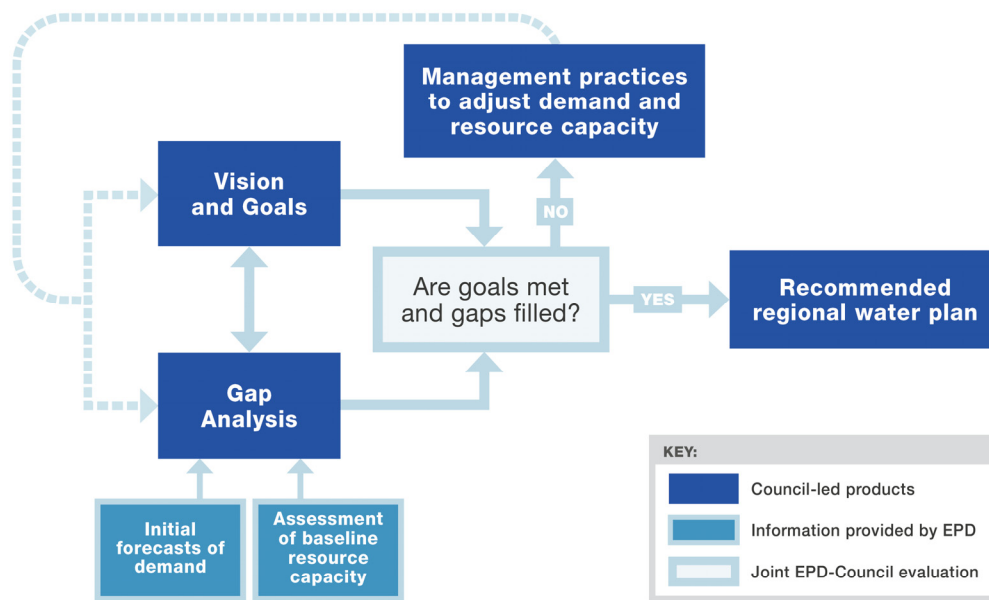
- *Regional Water Planning Guidance*² (July 2009)
- *Additional Guidance for Regional Water Plan*² (memo dated May 19, 2010)
- *Draft Water Conservation Guidance*³ (referred to as CM6 Guidance)
- *Detailed Guidance for Evaluating Practices to Manage Demands*⁴ (referred to as "Detailed Guidance", September 21, 2010)

The Council and its Planning Contractor (PC) used these resources and customized the processes described within the various guidance documents for evaluation of water resource gaps and management practices in the Savannah-Upper Ogeechee Region.

Process Overview

The management practices were selected to address water resource gap or issues identified in Resource Assessments⁵ conducted by EPD and the Vision and Goals defined by the Council. The Council selected the recommended management practices based on input from the Technical Committee, Plan Review Committee, Interstate Coordination Committee, council members, EPD, and the general public. This management practice selection process was based on an iterative process (see Figure 1) detailed in the *Regional Water Planning Guidance*.

Figure 1. Regional Water Planning Process



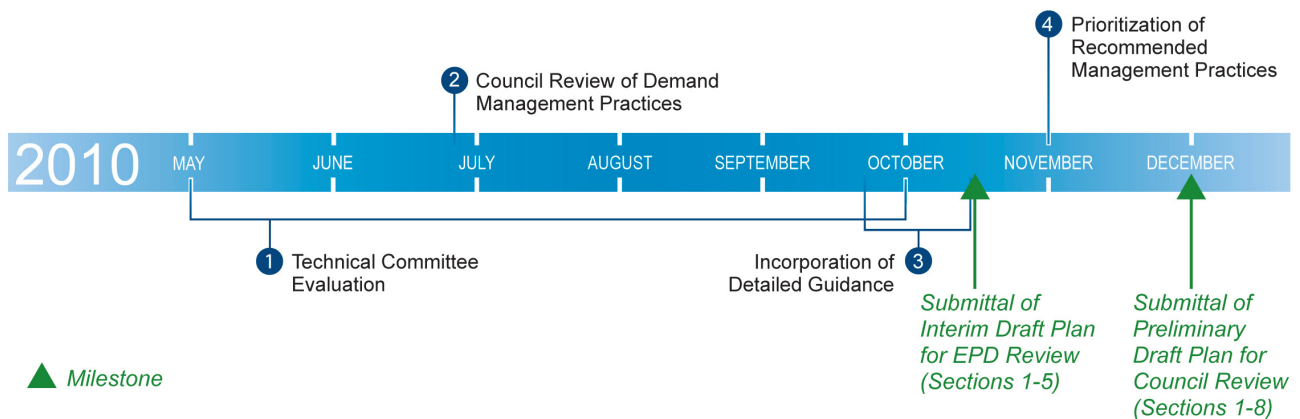
The concept of management practices was initially introduced in 2009, over the course of several Council meetings; however, the bulk of the work on management practices selection was conducted in 2010, after the Resource Assessments for future demand conditions were completed by EPD. The Council’s Technical Committee led the iterative development, review, and revision of all water quantity and quality management practices to be included in the Region’s Water Plan. The full Council reviewed these recommendations in subsequent council meetings, using the region’s Vision and Goals and EPD’s guidance documents as guidelines. Comments received from the general public and local governments during the planning process have been incorporated as appropriate in finalizing the selection. Figure 2 illustrates the interactive nature of the planning process among the Council, the Council’s Technical Committee, EPD and public/local governments.

Figure 2. Management Practices Decision Making Process



Figure 3 is a timeline featuring the major steps and milestones completed in 2010 related to management practice selection. Descriptions of the steps shown in the timeline are detailed below.

Figure 3. Council Management Practices Selection Process



1. Technical Committee Evaluation

The Council's three committees were formed in May-June 2010 and members of these committees were introduced to the Council in CM6⁶ on June 22, 2010. In June 2010, the Council's Technical Committee began the discussion of management practices by examining an initial list (Table 1) of potential water quantity and quality management practices based on those categories outlined in the State Water Plan. In the subsequent committee meetings (June through October 2010), the committee continued to discuss and refine the initial list, producing a detailed list of management practices that included expanded descriptions and examples. The PC revised the detailed list based on additional input received from the committee, other council members, and stakeholders.

2. Council Review of Management Practices

The concept and example of resource gaps and management practices were introduced to the Council in CM4 (November 10, 2010) and in each of the following Council meetings through June 2010. The tiered approach and the initial Tier 2 and 3 practices listed in the CM6 Guidance were both discussed at CM7 (September 8, 2010). The PC provided an overview of possible water conservation measures and discussed the definitions of the four tiers of measures in EPD's CM6 Guidance with the full Council.

3. Incorporation of Detailed Guidance

According to the Comprehensive State-wide Water Management Plan (State Water Plan), "water conservation will be a priority water quantity management practice implemented to help meet water needs in all areas of the state and will be practiced by all water user sectors (Section 7, Policy 3)." To comply with this policy, EPD issued "Detailed Guidance For Evaluating Practices to Manage Demand" (Detailed Guidance)³ on September 21, 2010 for use by regional water planning councils. EPD initially introduced the tiered approach to evaluating water conservation/demand management practices prior to Council Meeting 6 (referred to as CM6 Guidance⁴, June 2010). The Detailed Guidance replaced the CM6 Guidance.

In the Detailed Guidance, water conservation practices were divided into four tiers, as follows:

- *Tier One* includes basic water conservation activities and practices that are currently required by statute or will soon be required in EPD's upcoming amended rules (regarding the State Water Plan and SB370 – Water Stewardship Act).
- *Tier Two* includes basic water conservation activities and practices that will be addressed in EPD's upcoming amended rules, but not required of all permit applicants.
- *Tier Three* includes basic water conservation activities and practices that will not be addressed in current or upcoming amended rules.
- *Tier Four* includes "beyond basic" water conservation practices to be considered if a gap exists between current or future water supplies and demands for the region.

Each Council was expected to include demand management in its Regional Water Plan. The Detailed Guidance indicated that the level of regional demand management should be determined by:

- sustainable capacity of the regional resources (based on Resource Assessments)
- level of conservation already implemented by water users in the region
- economic benefits of demand management as compared to other quantity management practices

4. Prioritization of Recommended Management Practices

After reviewing the initial list of management practices prepared for an interim submittal for EPD in October 2010 and multiple discussions and considering feedback from Council members and EPD, the Councils' Plan Review Committee requested prioritization of the recommended management practices so that stakeholders can focus their efforts on the most important water resource issues in the Savannah Upper-Ogeechee Region. The recommended management practices were divided into two groups: 1) priority management practices; and 2) additional management practices (for details, see Tables 6-1A and 6-1B in Section 6 of the Regional Water Plan).

The priority management practices were selected to address water resource gaps and existing regulations. The Savannah-Upper Ogeechee Region has no water quantity/availability gap at three of the five nodes within the planning region. There are projected flow regime gaps at the Eden and Little Tennessee nodes. Therefore, the majority of the region only needs to address the Tier 1 demand management practices required by the Water Stewardship Act (SB370) and Tier 2 practices that EPD plans to address in upcoming rules and regulations. These Tier 1 and Tier 2 practices are included as priority management practices for the entire region (Table 6-1A of the Regional Water Plan). Tier 3 and Tier 4 practices are listed in the priority management practices for those counties associated with the Eden (Ogeechee Basin) and Little Tennessee nodes. These practices are listed as additional management practices (Table 6-1B of the Regional Water Plan) for the remainder of the region for consideration by entities wishing to further reduce future water demand and improve efficiency. One Council member representing the municipal, agricultural and energy sectors reviewed the water conservation practices listed in the Detailed Guidance. Table 2 lists the recommended water conservation goals, Tables 3 through 6 list Tiers 1 to 4 water conservation practices recommended by the Council, respectively. Tier 4 practices are only recommended for the area in the Upper Ogeechee Basin that is predicted to have a flow regime gap at Eden node (not meeting instream flow target). Because the majority of water use in the sub-basin is for agricultural irrigation, the Council recommended the Tier 4 agricultural water conservation practices for consideration by the agricultural users in this basin.

The Savannah-Upper Ogeechee Region also has potential water quality (assimilative capacity) gaps in some stream segments and in the Savannah Harbor. Priority practices were selected to meet permitted capacity needs and dissolved oxygen assimilative capacity needs (upgrade of existing wastewater treatment facilities, constructing facilities with advanced treatment processes, implementation of Total Maximum Daily Load).

Further Recommendations

Development or update of local water and wastewater master plans is recommended to identify specific local needs and issues not examined in detail in this high-level regional plan. The regional plans evaluated information on a regional and county basis, and the number of entities providing water, wastewater and stormwater services to customers within a county varies greatly. The Council stressed the importance in providing flexibility for entities within the region to conduct their own planning activities to address specific community issues following Regional Water Plan recommendations.

To address the projected 2050 wastewater flows, new wastewater treatment facilities will need to be constructed and some of the existing facilities will need to be expanded and/or upgraded. The water quality management practices identified in Table 6-1A have been selected to prevent water quality (assimilative capacity) degradation, assuming that future facilities and/or facility expansions (as identified in local master plans) will be designed to meet existing and future water quality standards.

Shared Resources Coordination

To address gap in resources shared by multiple regions, such as the gaps in the planning nodes in the Ogeechee River Basin, the PC coordinated on behalf of the Council (December 2010 through February 2011) with the PC for the Coastal Georgia and Altamaha Water Planning Councils and submitted revised modeling requests based on selected management practices (water conservation and drought management during low flow season) to address potential instream flow gaps predicted at Eden, Kings Ferry and Claxton nodes in the Ogeechee Basin. The results of modeling scenarios were reviewed and incorporated to further refine the management practices selected by the Council.

Demand forecasts for users in the Savannah River Basin in South Carolina were developed based on available permitted withdrawal and discharge data. Results of EPD's Surface Water Resource Assessments are documented in Technical Memorandum – Summary Future (2050) Resource Assessment in Savannah-Ogeechee (SO) River Basin⁷ (EPD, September 2010). The Council's Interstate Coordination chair also attended various meetings representing the Council. The PC and EPD discussed the regional water planning process and presented results of Surface Water Availability Resource Assessments to stakeholder groups in South Carolina in April 2011.

References

1. Regional Water Plan - Council Review Draft (Working Draft), December 2010, EPD
http://www.savannahupperogeechee.org/pages/our_plan/documents/SUO_WDCP_council_review_draft_120910.pdf
2. Regional Water Planning Guidance and Additional Guidance for Regional Water Plan (memo dated May 19, 2010), EPD
http://www.georgiawaterplanning.org/pages/technical_guidance/regional_planning_guidance.php
3. CM6 Guidance, June 2010, EPD
http://www.georgiawaterplanning.org/documents/DetailedGuidanceforEvaluatingPracticestoManageDemand-WebDocument_000.pdf, page 37 to 46
4. Detailed Guidance For Evaluation Practices to Manage Demand, September 2010, EPD
http://www.georgiawaterplanning.org/documents/DetailedGuidanceforEvaluatingPracticestoManageDemand-WebDocument_000.pdf
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http://www.middleocmulgee.org/pages/resource_assessments/index.php
6. Council Meeting 6 (June 22, 2010) Summary, EPD/Jacobs
http://www.savannahupperogeechee.org/pages/regional_water_planning/savannah-upper_ogeechee_council/documents/20100629_SUO_CM6_Mtnq_Summary.pdf
7. Technical Memorandum – Summary Future (2050) Resource Assessment in Savannah-Ogeechee (SO) River Basins (September 2010, EPD)

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Table 1: Management Practice Initial List By Category

WATER QUANTITY MANAGEMENT PRACTICES		
	OBJECTIVE	MEANS
Return Management	Increase return to river	Decrease septic tank system usage Decrease land application system usage Increase centralized treatment facilities
Demand Management	Reduce Water Waste and Loss	Use more efficient fixtures/equipment Use water system metering to reduce unaccounted for water Reduce non-revenue water Retrofit golf course facilities using conservation BMPs Implement education and outreach programs
	Decrease outdoor water use	Irrigation meters Full cost accounting Adopt conservation rate structures Provide voluntary landscaper certification
Supply Management	Increase supplies	Expand existing surface water reservoirs Build new supplies – surface or ground water
	Allow interbasin supply management	Interconnect supply systems Interbasin transfers
	Increase water reuse	Increase non-potable, indirect potable, direct potable
WATER QUALITY MANAGEMENT PRACTICES		
	OBJECTIVE	MEANS
Enhanced Pollution Management	Decrease runoff rates	Reduce impervious surfaces Retrofit old stormwater facilities
	Improve water quality	Protect sensitive land/environmental areas Implement OSSMS maintenance outreach programs Establish a CMOM for collection system Establish a Pollution prevention program for MS4 and collection system
	Allow water quality trading	Establish a water trading program
Enhanced Water Quality Standards and Monitoring	Improve water quality	Use advanced treatment at centralized treatment facilities Use constructed wetlands for effluent polishing
	Manage water quality	Adopt statewide/regional/local monitoring programs Coordinate environmental planning Implement source water protection measures Implement education and outreach program

Source: Jacobs JIG, 2010

Table 2: Water Conservation Goals

Foundational Water Conservation Goals
Educate and empower Georgia's water users
Create incentives to encourage water use efficiency
Enhance data collection, monitoring, research, and evaluation
Measure water use efficiency
Plan for the future
Integrate water conservation and energy conservation
Secure funding to implement water conservation
Agricultural Irrigation
Goal #1 : Research institutions and state agencies, in cooperation with farmers, should enhance their understanding of water use and levels of efficiency of existing agricultural irrigation.
GOAL #2 : Farmers should improve the efficiency of their irrigation systems.
GOAL #3 : Farmers should consider crop varieties, cropping systems and irrigation systems to maximize the efficient use of water on farms.
GOAL #4 : Farmers should minimize water loss from farm ponds, reservoirs and other rainfall collection systems.
Golf Courses
Goal #1: Golf course superintendents or managers should develop and implement a site-specific Best Management Practices (BMPs) plan for turfgrass water conservation.
GOAL #2 : Through a cooperative effort, research institutions and golf-related associations should determine a typical water use range for golf courses in Georgia that accounts for variations in rainfall and other climatic conditions.
GOAL #3 : GCSs, GGCSA and other golf industry groups should help foster a culture of water conservation inside and outside of Georgia’s golf industry.
Landscape Irrigation
GOAL #1 : Landscape and irrigation professionals and water providers should educate their customers on proper and efficient landscape water use practices.
GOAL #2 : Landscape and irrigation professionals and professional associations should establish state-wide standards for design, installation and maintenance of Georgia landscapes, landscape irrigation systems, and other systems dealing with landscape water conservation, such as rainwater catchments systems.
GOAL #3: Landscape and irrigation professionals, water providers, and local governments should help water customers reduce summer peak use.

Source: Detailed Guidance for Evaluating Practices to Manage Demands ⁴ (EPD, September 21, 2010)

Table 3: Tier 1 Recommended Water Conservation Practices for the Savannah-Upper Ogeechee Water Planning Region

(Practices addressed in statute and current or upcoming amended rules for non-farm water withdrawal permittees and drinking water providers)

T1 Practice
Applicants for non-farm water withdrawal permits or permit modifications must demonstrate progress toward water conservation goals or water efficiency standards. Water withdrawal permittees and drinking water providers must submit annual reports on non-farm water use that shall include data and information regarding implementation of water conservation plans and progress toward water conservation goals.
Drinking water providers must meet minimum standards and best practices for monitoring and improving the efficiency of public water systems, using a method developed by the International Water Association, and implement in a phased approach a water loss detection program. Providers serving over 10,000 individuals shall conduct water loss audits by March 2012, and those serving greater than 3,300 individuals by March 2013.
All multi-tenant buildings (residential, commercial, and industrial) constructed after July 1, 2012, to enable sub-metering by each tenant. This new requirement does not apply to renovations or rebuilding. The owners of the buildings shall charge for water and wastewater use by tenants and may charge for common area water and wastewater use.
All new construction permitted on or after July 1, 2012, must meet the minimum water flow and performance standards including: Water closets or toilets may not exceed 1.28 gallon per flush; Urinals (and associated flush valves) must use no more than .5 gallons per flush; Lavatory faucets (and aerators) may not exceed 1.5 gallons per minute; and Kitchen faucets (and aerators) may not exceed 2.0 gallons per minute.
Non-farm water withdrawal permittees must submit water conservation plans.
Water use for landscape related purposes is restricted between 10am and 4pm; Water use for non-landscape outdoor purposes is limited to three days a week (determined by customer address).
Public car wash facilities can be certified water efficient if employing water conservation practices.

Source: Detailed Guidance for Evaluating Practices to Manage Demands⁴ (EPD, September 21, 2010)

Table 4: Tier 2 Recommended Water Conservation Practices for the Savannah-Upper Ogeechee Water Planning Region *(Practices outlined in the SWP, to be addressed in rules and regulations as options for non-farm water withdrawal permit applicants seeking permit expansion or modification.)*

T2 Practices - Municipal
Consider conservation-oriented rate structures and consider informative bills.
Meter all water users.
Adopt a beneficial meter calibration, repair and replacement program.
Adopt a program to collect information on water use by the largest customers.
Adopt a program to collect information on water use by the largest customers.
Support the enforcement current outdoor water use schedule as required by State laws and regulations.
Meter water reuse and report reuse as required.
Consider reuse feasibility studies.
Consider the use of grey water.
Consider programs to replace or retrofit inefficient plumbing fixtures.
Update water conservation plans on a regular basis as required.
T2 Practices - Industrial
Consider facility-specific audits.
Measure all water withdrawals.
Measure or estimate water reuse and report reuse as required.
Consider rain or moisture sensor shut-off devices for irrigation systems.
Irrigate landscapes in compliance with outdoor water use schedule.
Consider reuse feasibility studies.
Consider the use of grey water.
Update water conservation plans on a regular basis.

Source: Detailed Guidance for Evaluating Practices to Manage Demands⁴ (EPD, September 21, 2010)

Table 5: Tier 3 Recommended Water Conservation Practices for the Savannah-Upper Ogeechee Water Planning Region

(Basic practices that will not be addressed in rules and regulations)*

T3 Practices - Agricultural
Conduct irrigation audits.
Meter irrigation systems.
Irrigate during time with low evaporation rate.
Inspect pipes and plumbing.
Compile data on cropping and water conservation practices.
Attend Irrigation workshops.
Use rain sensors on irrigation systems.
T3 Practices - Electric Generation
Integrate water conservation into educational programs.
Integrate water supply and water conservation impacts into long-term energy plans.
T3 Practices - Golf Courses
Conduct routine site surveys and system audits.
Develop and implement a Best Management Practices (BMPs) Plan.
Maintain a water use database.
Maintain water conservation logs.
Educate staff, members, and the community about conservation.
Educate the public about golf course water use and conservation efforts.
Offer training for Course Superintendent.

T3 Practices – Industrial
Consider regular water audits.
Practice dry methods for cleaning and dust control.
Discontinue discretionary use of water.
Consider conservation educational programs.
Determine water use efficiency metrics.
Consider cost-benefit analyses of water conservation practices.
Calculate water use intensity and establish efficiency targets.
T3 Practices – Landscape
Adapt existing educational programs to include outdoor focus.
Offer continuing education for landscape and irrigation professionals.
Distribute information to high-use customers.
Offer homeowners checklists and certification for sustainable landscapes.
Assess outdoor water use.
Calculate peaking factor.
Distribute information about efficient outdoor water use.
Offer guidance documents for outdoor water uses.
T3 Practices – Urban and Suburban Areas
Consider an education and outreach program for community residents.
Analyze customer water use data.
Categorize water customers by class.
Calculate average utility-specific per capita residential indoor water use.
Integrate water conservation into existing education curriculum.

Target education and outreach programs to high water users.
T3 Practices – State Agencies
Conduct regular water audits.
Meter and measure all water users.
Conduct regular cost-effectiveness or cost-benefit analysis.
Develop long-term water conservation plans.
Adopt efficiency standards adopted by the GA General Assembly.

Source: *Detailed Guidance for Evaluating Practices to Manage Demands*⁴ (EPD, September 21, 2010)

* Many of these practices are discussed in the "Handbook on Water Use and Conservation" by Amy Vickers (2001) and are described in the Resource Library for the Alliance for Water Efficiency - www.a4we.org.

Table 6: Tier 4 Recommended Water Conservation Practices for the Savannah-Upper Ogeechee Water Planning Region

(“Beyond Basic” practices that will encourage agricultural water demand management in the Ogeechee Basin to avoid potential instream flow shortage during low flow periods)

T4 Practices – Agricultural
Encourage Variable Rate Irrigation (VRI) controls
Encourage enhanced center pivot control panels
Encourage end-gun shutoffs with pivots
Encourage low pressure irrigation systems
Consider real-time meters on irrigation systems
Encourage conservation tillage
Control water loss
Encourage subsurface drip irrigation systems
Encourage Installation of rainfall shut-off devices

Source: Detailed Guidance for Evaluating Practices to Manage Demands ⁴ (EPD, September 21, 2010)