

Section 10: WATER RESOURCES ISSUES

As water systems in the Metro Water District continue to collaborate on regional water resources planning, water resources issues are identified. This Section outlines the regional water resource issues in the Metro Water District. Issues are identified and described within the subdivisions of federal operation of Lake Lanier and Allatoona Lake, water quantity and water quality issues.

FEDERAL OPERATION OF LAKE LANIER AND ALLATOONA LAKE

Lake Lanier and Allatoona Lake have played a key role in assuring an adequate water supply for the Metro Water District since their construction by the U.S. Army Corps of Engineers (Corps) in the 1950s. These federal reservoirs are multi-purpose projects that store water for multiple purposes: hydropower production, flood control, navigation, water supply, water quality, recreation, and navigation. Although, the Corps controls the storage in these reservoirs, the water in the State of Georgia is allocated and managed among users by the State of Georgia.

This Plan assumes that the federal reservoirs will continue to operate to meet water supply needs within the Metro Water District consistent with the guidance about future yield expectations provided by Georgia Environmental Protection Division (Georgia EPD). These assumptions are reasonable because Georgia EPD is the entity responsible for managing and permitting water withdrawals within the State. Furthermore, the Metro Water District believes that water use within the Metro Water District is reasonable, constituting only 1 to 2% of the total volume of water passing from Georgia to Florida in the Apalachicola-Chattahoochee-Flint (ACF) basin, and a similar fraction in the Alabama-Coosa-Tallapoosa (ACT) basin. In addition, after reviewing alternatives to the use of the federal reservoirs, *the Metro Water District has concluded that there are no alternatives to the Chattahoochee River and the Etowah River as major water supply sources for north Georgia.*

Finally, it should be noted that expectations regarding water supply available from the operation of Lake Lanier and Allatoona Lake assume operation of these Corps reservoirs based on a balanced operation of the projects for all purposes. Recent changes in Corps operations of these Lakes beginning in 2006 represent a dramatic change and are of concern. In addition, the operation of the federal reservoirs is the subject of litigation of which the outcome is uncertain. Nonetheless, the Metro Water District trusts that Corps will eventually develop Water Control Plans for the ACF and the ACT that provide a balanced approach for all the users of each system.

WATER QUANTITY ISSUES

Water resources issues provide a contextual framework for the limitations on water quantities available for use within the Metro Water District. Multiple uses for water supply must be considered and balanced with the needs of instream and downstream users. The issues presented below include consumptive use, regulation of small water withdrawals, instream flow protection

policy, and downstream use concerns. Elements of these issues overlap with some of the concerns noted in the discussion of water supply.

CONSUMPTIVE USE

An important consideration for the Metro Water District is the effect of consumptive use. Consumptive use, as defined in the Georgia Comprehensive State-wide Water Management Plan, is the difference between the total amount of water withdrawn from a defined hydrologic system of surface water or groundwater and the total amount of the withdrawn water that is returned to that same hydrologic system over a specified period of time. Water use is consumptive when water is removed from a specified hydrologic system of surface water or groundwater and is not returned to that same system within a time frame that allows contemporary users and uses to avail themselves of the benefits of that quantity of water. The Georgia Comprehensive State-wide Water Management Plan specifically identifies the following as water uses that contribute to consumptive use:

- **Water Reuse:** is the use of reclaimed water as a substitute for another generally higher quality water source. Reclaimed water can be reused for the beneficial irrigation of areas that may be accessible to the public (such as golf courses, residential and commercial landscaping, parks, athletic fields, roadway medians, and landscapes) and for other beneficial uses such as human uses, cooling towers, concrete mixing, and car washes.
- **On-Site Sewage Management Systems:** is a sewage management system other than a public or community sewage treatment system that serves one or more buildings, mobile homes, recreational vehicles, residences, or other facilities designed or used for human occupancy or congregation, and which is permitted by a local county board of health under rules promulgated by the Department of Human Resources. Such term shall include, without limitation, conventional and chamber systems, privies, and experimental and alternative on-site sewage management systems that are designed to be physically incapable of a surface discharge of effluent that may be approved by the Department of Human Resources.
- **Land Application Systems:** Any method of disposing of pollutants in which the pollutants are applied to the surface or beneath the surface of a parcel of land and which results in the pollutants percolating, infiltrating, or being absorbed into the soil and then into the waters of the state. (Note: source for this definition is the Georgia Department of Natural Resources General Land Application System Permit for Large Communities)
- **Interbasin Transfers:** is a withdrawal or diversion of water from one river basin, followed by use and/or return of some or all of that water to a second river basin. The river basin from which the withdrawal or diversion occurs is termed the ‘donor’ basin, and the river basin to which all or a portion of the water is diverted and returned is termed the ‘receiving’ basin.

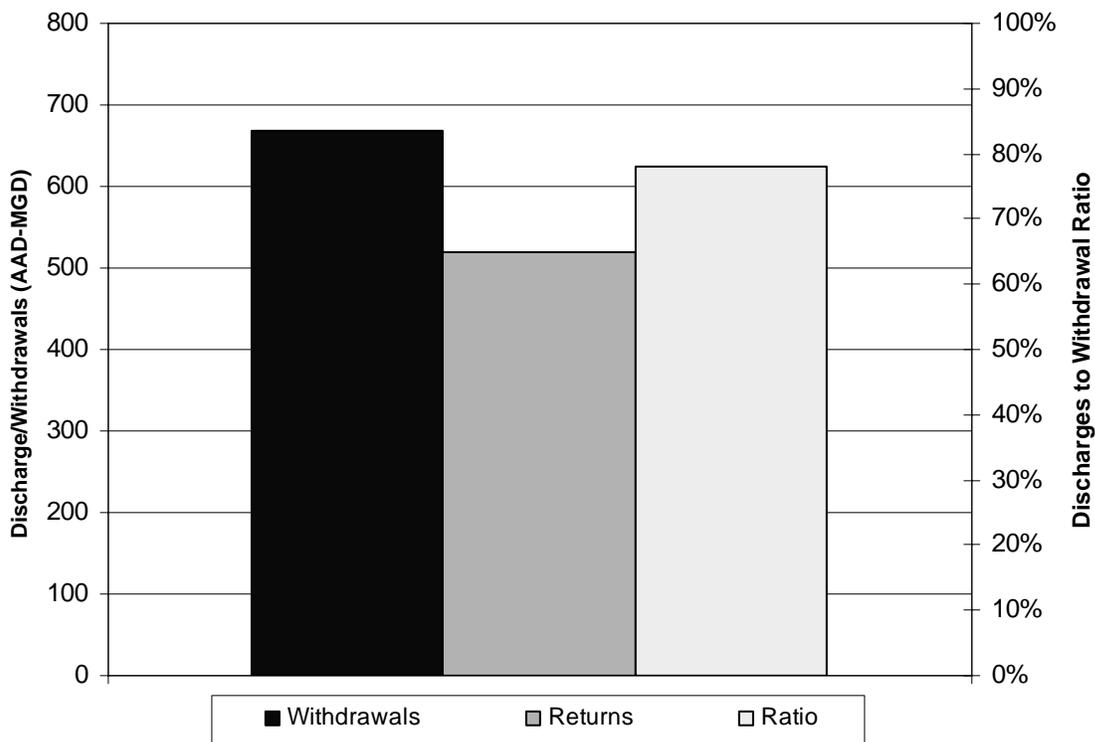
The Georgia Comprehensive State-wide Water Management Plan recognizes that each of the above water management practices can be appropriate, viable measures; however, managing the consumptive uses of water is necessary to meet water demands in a sustainable manner. This Plan states that managing consumptive use of a water source involves the integrated management of

demands from that source, returns to that source, and actions taken to supplement the supply that source provides.

Consumptive use is an important consideration for the Metro Water District for maintaining local stream flows and water supplies. A goal of the Metro Water District’s plans is to minimize consumptive uses to the extent possible, while also balancing other goals and considerations. In terms of this Water Supply and Water Conservation Management Plan, consumptive use is a demand management strategy. The Wastewater Management Plan focuses on the consumptive losses from onsite-sewage management systems and land application systems with a long-term goal of returning water so that it is available for instream and offstream uses and users.

The Metro Water District was provided planning guidance by Georgia EPD to return 58% (annual average) of the water withdrawn from the Chattahoochee River basin. Figure 10-1 shows that the Metro Water District will meet the return target for the Chattahoochee basin in 2035. In the future Georgia EPD may modify the existing planning guidance for the Chattahoochee basin and/or identify return targets for others basins through the Comprehensive State-wide Water Management Plan. In order to manage consumptive use, local governments should consider the implications of local land use planning, specifically the role of septic systems in future growth. If a local government chooses to develop on septic systems they might have to consider other ways to reduce water demands and consumptive uses such as more intensive water supply system leak detection, low flow plumbing retrofit programs or banning outdoor irrigation.

FIGURE 10-1
Chattahoochee Basin Withdrawals and Discharges for 2035



RESERVOIR STORAGE RELIABILITY

During the current drought, several communities have suffered from dangerously low reservoir levels. Weather conditions over the past few years present the possibility for a new drought of record. These more extreme conditions will require more conservative sizing of reservoirs in the future. Communities with offstream supplies or small drinking water supply watersheds face the largest challenges during drought conditions. Reliability of existing and future reservoirs is a long-term challenge for the Metro Water District. Reservoir sizing should account for future demands, drought conditions, the impact of global climate change, loss of storage volume over time due to sedimentation, impacts of urbanization on base stream flows, and consideration of additional storage contingency.

REGULATION OF SMALL WATER WITHDRAWALS

Under current Georgia EPD guidelines, a private entity can withdraw from a groundwater or surface water source up to 100,000 gpd without a withdrawal permit. During the recent drought conditions, small surface water withdrawals and wells have become more common to provide irrigation water to avoid drought irrigation restrictions. Individuals have been able to withdraw water for irrigation purposes when downstream users were lacking abundant water supply. Since the quantity of water withdrawn under 100,000 gpd is not required to be reported, it is difficult to quantify the impact on instream and downstream water users. This issue is discussed further in Section 11.

INSTREAM FLOW PROTECTION POLICY

Water withdrawals affect downstream flows. Without limitations on withdrawal quantities, detrimental impacts to natural habitats and downstream users can occur. Georgia protects its water systems by mandating a minimum instream flow. Georgia's minimum instream flow policy historically was based on the 7Q10, which is the statistical figure that reflects the lowest 7-day running average of a stream's flow with a recurrence frequency of once in ten years. In order to better protect the health of aquatic ecosystems and to protect downstream users, Georgia EPD established a new minimum instream flow policy, effective April 1, 2001. All new applications for new or expanded surface water withdrawals are required to meet the 2001 minimum flow protection requirements. Applicants are required to select from one of the following three options for the 2001 minimum instream flow requirements:

- Option 1 – Monthly 7Q10 Minimum Flow
- Option 2 – Site-Specific Flow Study from which seasonal instream flows would be derived
- Option 3 – Mean Annual Flow: specific percentages of mean annual flow for regulated and unregulated streams, with seasonal adjustments

This policy is not applicable to those streams whose flows are determined by the operation of a Federal reservoir, such as the Chattahoochee River below Buford Dam and the Etowah River below Allatoona Lake.

Existing withdrawal permits will be revised to take into account the 2001 minimum instream flow requirements when permit holders request additional withdrawals from the source. The 2001 minimum instream flow policy is identified in the Georgia Comprehensive State-wide Water

Management Plan as being consistent with protection of natural systems and biological integrity of the water resources to which the permits apply.

EMERGENCY AND DROUGHT PLANNING ISSUES

Sound planning can reduce the vulnerability of local water systems to unplanned events. Emergency response plans that provide an action plan should unforeseen incidences occur can reduce critical reaction time. Drought management planning at the State and local level ensures contingency plans are in place to meet critical water needs.

Vulnerability assessments are required under the EPA's Public Health Security and Bioterrorism Preparedness and Response Act of 2002. Community water systems (CWS) that serve more than 3,300 persons were required to complete a vulnerability assessment on all components of the system (wellhead or surface water intake treatment plant, storage tank(s), pumps, distribution system and other important components of the system). Based on the vulnerability assessment, local water providers were required to complete or update an emergency response plan (ERP) that outlined response measures in the case of an incident. Several communities in the Metro Water District are implementing policies and procedures to increase water system security.

This Metro Water District plan calls for long term water efficiency which lowers water use over time while not negatively impacting the citizen's quality of life. Drought planning differs significantly from long term efficiency planning due to the necessity for implementation of emergency measures that can have significant economic and quality of life impacts on the citizens. This Plan calls for year-round water conservation practices, even during non-drought periods and established triggers to determine the severity or level of necessary drought restrictions required during drought conditions. The drought level increases with the severity of the drought as do the water use restrictions.

One of the permanent, non-drought water conservation practices is an outdoor watering schedule. This schedule is based on an odd-even outdoor water use schedule, in which odd numbered addresses may water on Tuesdays, Thursdays, and Sundays, and even numbered addresses may water on Mondays, Wednesdays, and Saturdays. Exceptions and specific schedules for commercial and other non-residential water uses are specifically stated in the Georgia Drought Management Plan.

Georgia EPD may request or order permit holders of both water treatment plants and water withdrawals to restrict water usage when the Director of Georgia EPD determines that such measures are necessary to protect and preserve public health and welfare, and/or aquatic communities. For example, if a water distribution system's pressure drops below 20 pounds per square inch, the Director may determine that public health is at risk, and may require water use restrictions. Georgia EPD may also restrict businesses that use large volumes of water, such as car wash facilities and garden centers, during drought periods. These measures are short-term to mitigate water shortages and prioritize water usage.

CLIMATE CHANGE IMPACTS

The recent Intergovernmental Panel on Climate Change (IPCC) Fourth Assessment Report: Climate Change 2007 determined more conclusively than ever before that global climate is warming at an accelerated rate and is likely due to man-made greenhouse gases. General changes

in weather that are predicted to accompany this warming in the southeast are that dry and wet weather events will become more intense than in recent decades. Although more study is needed to determine precisely how climate will change in the Metro Water District area, the following general impacts are likely:

- More frequent heat waves
- Increases in evaporation
- A decrease in annual precipitation
- Increased variability of precipitation including:
 - More severe and extended drought
 - Increased frequency and intensity of rain events

Climate change introduces an additional element of uncertainty for managing water resources. The probable impacts on water supplies that should be considered are increased water use due to increased temperatures and reduced reservoir yields due to evaporation and extended drought. The potential impacts on water quality that may accompany climate change include more erosion and turbidity due to more frequent and intense rain events. Warmer water may also impact the water quality of supplies. Increased flooding may also damage public water supply facilities that are located in or near flood prone areas.

If climate change increases water demand by 10% this would increase the average annual demand in the Metro Water District to 1,112 AAD-MGD in the year 2035. The Metro Water District should monitor information regarding climate change and as more specific data is available for the region take this into account in future plan updates.

There are actions that are already part of the water supply planning process that will help to mitigate the impacts of global warming in the Metro Water District. The water conservation program in this plan will reduce water use and use the limited water supply more efficiently. Returning reclaimed wastewater to reservoirs such as Lanier and Allatoona will also serve to make water supplies more reliable in extended drought.

Additional measures that should also be considered in future planning include:

- Review yield of existing reservoir storage in light of changing conditions;
- Increase off-stream storage to mitigate impacts of reduced yield; and
- Develop multiple and diversified sources, where possible, to increase reliability.

WATER QUALITY ISSUES

Water quality is where the linkage amongst the three Metro Water District plans is the clearest; protecting water quality is one of the primary objectives of the planning efforts. Water quality is not only important to ecological habitats but also to sustain water supplies for potable uses. Issues related to water supply and quality include water treatment requirements, EPA Groundwater Rule, chemicals of concern and sedimentation of stream and river intakes.

WATER TREATMENT STANDARDS

Water treatment standards are expected to become more stringent over the next 30 years as the expectations for higher quality drinking water continue coupled with more reliance on reclaimed water to augment water supply sources. To date, EPA has developed the majority of the regulations that were required to be promulgated by the 1996 Safe Drinking Water Act Amendments. Two key rules have taken effect since the 2003 Water Supply and Water Conservation Plan: The Long-Term 2 Enhanced Surface Water Treatment Rule (LT2ESWTR), which focuses on treatment and control of the microorganism *Cryptosporidium*; and the Stage 2 Disinfectants/Disinfection Byproducts Rule (D/DBPR), which focuses on the long-term health effects of exposure to compounds produced by chlorine disinfection practices, used by most local water providers within the Metro Water District.

For LT2ESWTR, monitoring starting dates are staggered by system size. The largest systems (serving at least 100,000 people) began monitoring in October 2006 and the smallest systems (serving fewer than 10,000 people) began monitoring in October 2008. After completing monitoring and determining their treatment needs, systems will generally have three years to comply with any additional treatment requirements. Systems must conduct a second round of monitoring six years after completing the initial round to determine if source water conditions have changed significantly.

The Stage 2 D/DBPR rule builds incrementally on existing D/DBPR rules. The first step is a multi-year process to determine the areas of the distribution system with the highest risk. If disinfectant or disinfection byproduct levels are too high, local water providers will have to implement operational or treatment changes. The time to complete system modifications will depend on the system size. Most water systems in the Metro Water District initiated monitoring in Fall 2007 under the Stage 1 D/DBPR rule. By April 1, 2012, most local water providers in the Metro Water District must submit a monitoring plan and begin compliance with Stage 2 D/DBPR. All local water providers should be in compliance with Stage 2 by 2016.

These two rules may require changes in the treatment practices of many water utilities during the next 30 years. Some of the technologies that may be required for compliance with these new rules include optimization of existing chlorination practices; use of alternative oxidants and disinfectants (such as ozonation and ultraviolet (UV) disinfection); optimization of coagulation, and/or higher levels of organic precursor removals, including membranes, advanced oxidation processes or granular activated carbon (GAC) treatment.

EPA is continually evaluating potentially harmful compounds in drinking water that may be regulated in the future. Based on past experience, the time it takes for a contaminant to go from being listed on the Contaminant Candidate List (CCL) to being regulated is 10 to 20 years. Because of this continually-updated process, additional drinking water contaminants will be regulated during the 30-year study period. It is difficult to predict the specific compounds to be regulated and the treatment technologies that may be needed to treat them. However, it is likely that water treatment plants will be required to continually evaluate their performance and optimize existing treatment or add new technologies. These changes in treatment standards will need to be addressed in future updates to the Water Supply and Water Conservation Management Plan.

GROUNDWATER TREATMENT RULE

EPA published the Groundwater Rule (GWR) in the Federal Register on November 8, 2006 in response to requirements in the 1996 Amendments to the Safe Drinking Water Act. The purpose of the rule is to provide for increased protection against microbial pathogens in public water systems that use groundwater sources. The GWR applies to public water systems that rely on groundwater or to any system that mixes surface and groundwater if the groundwater is added directly to the distribution system and provided to consumers without treatment. Currently, less than one percent of the Metro Water District's water supply is obtained from groundwater sources. However, the increase in operating costs, due to additional monitoring and disinfection requirements may make some of the existing and future groundwater sources less viable, further increasing the Metro Water District's reliance on surface water.

CHEMICALS OF CONCERN

Chemicals of concern is a term used to describe a wide array of chemicals and microorganisms that are suspected of posing a risk to public health through drinking water, that include pharmaceuticals and personal care products (PPCP's) and endocrine disrupting compounds (EDCs). Chemicals of concern are not presently regulated, partly because of difficulty with analytical techniques, detection limits levels and lack of baseline information on ambient concentrations. The EPA tracks chemicals of concern through the CCL.

In the future, if removal of these chemicals of concern becomes regulated, advanced treatment techniques, such as UV disinfection, nanofiltration (NF) or reverse osmosis (RO) membranes will become common in the Metro Water District. Treatment for chemicals of concern is also covered in the Wastewater Management Plan. Educating the public on proper disposal of pharmaceuticals and household chemicals will help reduce the contribution to the sanitary sewer waste stream and ultimately in source water supplies.

SEDIMENTATION OF STREAM AND RIVER INTAKES

Excessive sedimentation at water intakes can cause interruption in water supply and serious abrasion of pumps with consequent higher operating costs. Sediment entrainment at pump intakes is caused by erosion and high sediment loads within the contributing watershed. Smaller intakes on smaller streams and rivers are more prone to sedimentation. In addition, high turbidity increases treatment costs and issues for local water providers. Communities in the Metro Water District will need to enforce existing erosion and sedimentation control regulations, as discussed in the Watershed Management Plan, to help prevent sediment from reaching receiving waters.