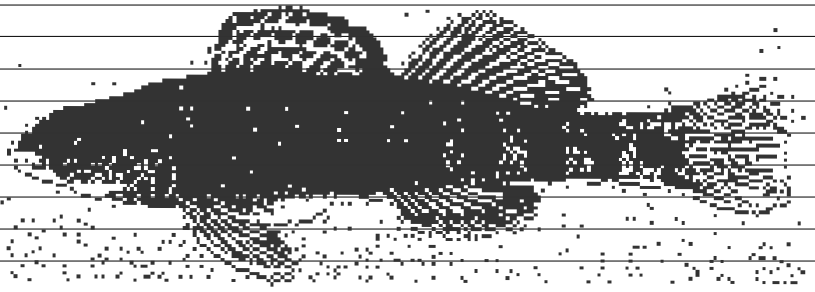

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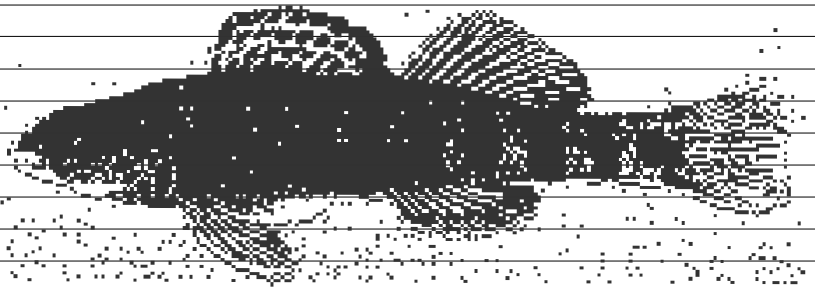

THE ETOWAH INITIATIVE

WHY WATER EFFICIENCY?

Too much of the public, water seems infinite in its abundance. We see vast oceans, rivers and lakes. Every time we turn on our faucets water comes out. Because of this, the need for efficient water use is not often realized. Those that deal with water allocation on a day to day basis, however, see a different picture.

A mere 1% of the planet's water is available for human use. The rest is either salinated in the oceans or frozen in the glaciers. Climatic trends are tending towards drought ridden summers. Water is not as abundant as it first seems. Population growth predictions for north Georgia, if realized, will stretch this finite resource even thinner. Demand will begin to exceed supply.

Water resources must also be shared with neighboring states when the source, whether it be a river system or a ground water aquifer, crosses state boundaries. This is a common situation and one that often leads to conflict as is the case with Georgia and our neighbors, Alabama and Florida. While Georgia's situation is by no means as dire as the arid western United States, it is important that water efficiency measures are taken before crises occur.

ECONOMIC BENEFITS

Water efficiency has often been perceived as being economically demanding and as requiring the sacrifice of a certain standard of living. This is no longer the case. For homeowners, water efficiency technologies such as low flow showerheads and toilets have become very affordable and function equal to, or better than, those technologies to which we have become accustomed. This helps make the transition less burdensome both financially and practically. Efficiency has proven time and time again to reduce water, sewer and energy bills for the homeowner. Examples cite savings of between 15% and 43% when various levels of efficiency are executed[1].

Economic benefits exist for water utility managers and community planners as well. Generally, implementation of water efficiency programs is less expensive for water providers because this is a demand-based approach to meeting a community's water needs. Commonly, water providers use a supply-based approach which aims to provide more water and wastewater treatment capacity. Supply-based programs involve high up-front costs that are attached to demand predictions that may not be realized by the community. Demand-based planning considers ways to reduce demand the first priority as opposed to looking for ways to increase supply. A lower financial risk is involved in demand-based planning. In establishing a water efficiency program you remove, or postpone, the need for the extensive infrastructure expansion necessary to support increasing water demands by increasing populations.

The cost of implementation of water efficiency programs is not only less than traditional programs, it can also be spread out over time. Efficiency plans can be incremental in their design. Implementation can occur gradually as opposed to the high lump sum commitment involved in infrastructure development such as the creation of reservoirs or expanding water treatment facilities. One analysis determined that water supplied by a new dam or desalinization plant may cost between $500 and $2000 per acre-foot whereas municipal water efficiency can provide water for $50 to $200 per acre-foot.[2] Payback periods shorten, operating costs decrease, and repair costs are minimized.

ECOLOGICAL BENEFITS

Communities today have increasing concerns about the quality of their water for reasons of both human and ecological health. A reduction in surface water use results in the maintenance or increase of stream flow levels which benefits the health of river systems. Healthy water resources allow natural systems to maintain their functions of buffering and filtering out pollutants, recycling organic materials and providing habitat for wildlife. Healthy stream ecosystems also provide scenic and recreational opportunities which Georgians prize.

Efficient water use also benefits groundwater resources. Reducing withdrawal rates can prevent contamination of aquifers by saltwater intrusion and pollution from landfill and toxic waste sites.

TRI-STATE WATER WARS

Both Alabama and Florida have filed suit against Georgia over water quantity issues. This dispute remains unresolved. The resolution of this conflict will undoubtedly require that Georgia more efficiently use the water resources that are also used by the two downstream states.

If the compacts formed by the three states do not resolve the conflict over water, the situation may be resolved by other means. The most likely possible solution would be through the Supreme Court of the United States, which has original jurisdiction in conflicts between states under the Constitution[3]. The Court resolves disputes between states as to the distribution of water under the doctrine of equitable apportionment[4].

Historically, water rights disputes in the eastern United States have been governed by the riparian rights doctrine. Under riparian rights, those downstream have a right to have water flow uninterrupted and unpolluted. Though the Court would weigh this concept into a calculus, equitable apportionment is the theory under which the Court would most likely decide the dispute between Alabama, Florida and Georgia[5].

When applying the doctrine of equitable apportionment, the Court uses fairness as the measuring stick[6]. In considering whether the apportionment of the water is fair, the Court balances the beneficial uses of the upstream users with the harm to the downstream users by taking into account such factors as: whether reasonable water conservation measures are currently being employed by the upstream state; whether the benefits to one state are more substantial than the harm done to the other state; and whether the state has tried other ways of diverting water. Equitable Apportionment extends to a state's claim for water for future uses, too[7].

If this case were to go before the Supreme Court, Georgia faces an uncertain fate. Many of the counties within the basin, which includes the five counties in the Upper Etowah River Alliance, do not employ water conservation measures, a factor considered in the decision process. Some counties like Cobb and Chatham, have established conservation programs that are effective. The adoption of similar programs in the Upper Etowah River may help avoid an interstate water war as well as allow the counties in the Alliance to accommodate growth in the most cost effective manner.

WHAT CAN BE DONE?

Despite the current concern over water availability, few, if any, laws or programs promoting water efficiency exist in the Upper Etowah River Watershed. Xeriscaping and indoor water efficient technologies are not actively promoted to the public. Due to increased growth in the area and limited water resources, a few counties in metropolitan Atlanta area are in the process of considering increased water rates for periods of high use (e.g. summer watering restrictions) and a rate structure for the quantity of water consumed. Since domestic water consumption in the Etowah region is 35-70 times any other single water use (including commercial and industrial), conservation efforts that concentrate on limiting water used for lawn care and promoting water-efficient technologies for the home and business could have a large impact on overall consumption. Public awareness programs, incentive-based promotion of water-conservation technologies, in addition to rate structuring could significantly decrease water-use in the Etowah region.

RATE STRUCTURING

The three common types of rate structuring are declining block, increasing block and flat rates. The declining block rate structure can actually encourage wasteful water use by reducing cost with the more water used. Flat rates apply year-round, independent of the amount of water used. This is a more neutral rate structure neither actively encouraging or discouraging water use. When combined with peak demand surcharges this structuring format is often effective in encouraging water efficiency. Peak demand surcharges encourage water efficiency at times when it is most difficult to meet the needs of the water users. In Georgia, this is of course during the summer months when outdoor water use is at its peak and rainfall levels are at a minimum. At times, water levels cannot meet demand. Education should be an integral part of implementing surcharges on water use. Increasing block rate structuring penalizes the water user by charging higher rates as water use increases. This is a very pro-active method for inducing water use reductions. Here, a relatively low rate is charged for the quantity of water determined as “necessary” to meet basic needs of the water customer. Water use above this set quantity increases in cost according to set intervals.[8] Again, if this structure is employed it should be coupled with an education effort that gives the water customer options for reducing water use.

INDOOR WATER EFFICIENCY

In establishing an effective water conservation program, efforts must be made in all areas to avoid using excessive amounts of water. Indoor water efficiency can be achieved through a variety of methods, including fixture programs, incentive programs and education. A number of communities have created innovative programs to actively involve residents in the effort to conserve water. Listed below are a number of possible ways to reduce the water demand indoors.

Requirements for new and replacement plumbing fixtures are probably the most common type of local regulation to promote water efficiency. Congress enacted requirements on the national level in the Federal Energy Policy Act of 1992. Under this act, as of January 1, 1994, new construction required the installation of ultra-low flush toilets, with a few commercial exceptions.

With a flush capacity of 1.6 gallons, ultra-low flush toilets use substantially less water than the conventional 5 gallon per flush toilets that were previously standard. The long-range savings for such fixtures is significant[9]. In Georgia, House Bills 605 and 1827 became law in 1992 requiring the use of water efficient showerheads, faucets and toilets in all commercial and residential construction.

This legislation can be complemented at the local level to include retrofit programs, outreach, distribution of indoor water efficiency kits, and incentive program that encourage the replacement or repair of inefficient fixtures. The success of such programs are due in part to the fact that cost differentials between conventional and efficient fixtures are rapidly offset by water and energy savings.

Retrofit Devices for Existing Fixtures. Retrofit devices are installed on existing fixtures to reduce water use. Many are low cost and easy to install. When existing showerheads, faucets, and toilets are replaced, the costs can be recovered within a couple of years in the savings on water bills[10]. Thus, after the initial installation costs, the consumer sees immediate results.

- **Toilet Tank Displacement Devices.**[11] Devices, such as bags, are put into the tank. They can reduce the amount of water per flush by up to a gallon. These devices have a limited life-span of 3-5 years.
- **Variable Flush Time Devices.**[12] Devices operate by altering the force acting on the toilet tank flapper valve, by using, for example a float attached to the valve. The cycle time of the flush is effectively shortened so as to reduce the volume of water.
- **Dual-Flush Devices.**[13] These devices provide for a full volume flushing mode for solid waste, and a lower volume flushing mode for liquid or paper waste.
- **Low-Flow Showerheads.**[14] Showerheads reduce the amount of water by as much as one-half of the water used within the specified time of a shower by restricting the flow through the showerhead. (For example, the rate of water may be reduced from 5-8 gallon per minute to 2.75 gallons per minute).
- **Low-Flow Faucets.15** Such faucets lessen the water flow through faucets by means of a restrictor or aerator. Rate of water use can be reduced by as much as one-half of the regular water flow.

These devices are often available in kits. A typical comprehensive kit, for example, might contain two (2) low-flow showerheads, two (2) toilet tank displacement devices, and two (2) toilet leak-detecting dye tablets. Some utilities will provide such kits free to their customers upon request, or for a small fee. Athens-Clarke County and Chatham County are two areas in Georgia that supply such kits.

Indoor Leak Repair[16]

Leaking toilets and pipes are a major source of water inefficiency. For example, the Department of Housing estimates that approximately 20% of all existing toilets leak. The leaks often consume more water than the use of the toilet. Toilets may be checked for leaks by the use of dye tablets. Tablets are dropped into the toilet tank; if the tank leaks, a bright colored dye will appear in the toilet bowl.

Insulation[17]

Insulation around hot water pipes can help save significant amounts of water. People often let the cold water run out of hot water pipes, wasting about 2 gallons per person per day. Builders in new construction are required to insulate hot water pipes, an effort which saves energy and reduces the amount of water used.

Incentive Programs

These programs can be very helpful in encouraging people to take part in water conservation efforts. Often such programs are run through the utilities. Programs include connection fee discounts or consumer rebates for properties that meet specified conservation criteria. These specified criteria may include installation of low-flow plumbing fixtures.

Education

See the section on Education and Awareness for tips to aid the municipal water user in improving indoor water efficiency.

CASE STUDIES

A number of local governments throughout Georgia and the United States have employed effective indoor water efficiency programs. Below are some brief descriptions of some of these programs:

A. ***Replacement of Existing Fixtures*—Monterrey Peninsula Water District-Monterrey, California**[18]. The Monterrey Peninsula Management District mandates that property owners must replace all conventional fixtures with water efficient fixtures before selling the property. Though this measure has higher private costs because the parties are required to buy and install new fixtures, short term and long term savings result.

B. ***Replacement of Existing Fixtures*—Project Harambee: Atlanta, Georgia**.[19] In the Brown Village Community of Southwest Atlanta, an innovative project was begun aimed at reducing residential water consumption through the installation of low-flow technologies. Ultra low-flow toilets[20] and showerheads[21] were distributed to single family residents in this community who participated in the

homes. Each of the 247 households that participated in the program are expected to save $120.00 per year on their water bill alone, totaling over $30,000 for the community. Over 17,000 gallons of water per day, 6.2 million gallons annually, should be conserved as a result of this program.

C. ***Rebate/Incentive Programs*—Santa Monica, California**.[22] The city of Santa Monica offers $100 rebates to residents who install low-flow showerheads and toilets on their homes or rental properties. In the first 18 months of the program, more than 10,000 toilets were replaced.

OUTDOOR WATER EFFICIENCY

An important part of an effective water efficiency program is understanding when water demand is highest, why, and what can be done to lessen the demand on this precious resource. In Georgia, water demand dramatically increases during the summer months. This increase can be traced, in large part, to outside water use. So how can the need for outside watering be decreased?

There are several different ways that water can be conserved. These means are relatively easy to employ, and inexpensive, especially in comparison to the money that would be required to build alternative water supply sources. These programs can be instituted through education, incentives, or ordinances. A short description of some of the different programs that have proven effective is provided here. And finally, a detailed sample ordinance is provided (See Appendix B).

OUTDOOR WATER EFFICIENCY PROGRAMS

One of the easiest options is to promote the use of water efficient landscaping. Water efficient landscaping can be achieved through employing xeriscaping techniques; using interns to help the public utilize such techniques, instituting water restriction plans to deal with emergency drought conditions, designing and implementing incentive programs, and establishing watering times that are most efficient. A comprehensive ordinance can be found in Appendix B. This ordinance is most suitable for a heavily urbanized or rapidly developing area. However, portions of it may be adapted and used to fit the needs of a more rural or slowly developing area that is interested in taking a pro-active stance on water conservation.

Xeriscape[23]

Xeriscaping is defined as "quality landscaping that conserves water and protects the environment." This concept is targeted at reducing outside water use, and thus reducing peak water demands and the resulting water bills. Additionally, water resources may be extended. Xeriscaping incorporates the concepts of planning and design along with soil analysis, plant selection, efficient irrigation, turf selection, mulch use, and ap-

propriate maintenance. Educational materials and Xeriscape guides are currently available through the Georgia Water Wise Council. One means of effectively implementing Xeriscape programs has been to use landscape design or horticulture interns.

A landscape architecture or horticulture student from the University of Georgia can be hired to provide residential consumers with free landscape consultations utilizing xeriscape ideas.[24] Georgia Water Wise Council helps locate and place these interns. The intern helps homeowners and business owners design a landscape that will thrive in the hot Georgia summers and temperate winters. The resulting landscapes require less water during the peak summer months. The strain on the water supply is lessened and the consumer's water bill is lower. Additionally, plants have to be replaced less often, because they are chosen for their suitability for the climate. Such a program could also be effectively utilized for those on well-water, since that water supply is connected through the ground water to the overall water system.

Water Restriction Plans

When summer heat and drought take effect, local governments must often take action to prevent the water supply from being over used. Careful planning with restrictions can help protect the water resources even more. During these critical periods, many areas employ an odd-even watering rotation, such that those with odd addresses may water on the odd numbered days, and those with even addresses water on the even days. Though this can help curb the demand on the water supply, more effective methods exisit.[25] One such method is to restrict the times of day during which people are permitted to water. By implementing such a program, people are less likely to water excessively and more likely to use water only when necessary. An example of some drought condition restrictions are listed below.[26]

Phase I – no watering from 4pm - 10pm.

Phase II – no watering from 4pm - 10pm and on weekends.

Phase III – no watering, except from 10pm - 6am.

Phase IV – no watering. Complete ban.

Incentive Programs. Incentive programs can work in a proactive manner to get citizens involved and excited in water efficiency programs. A variety of programs exist, including programs where the local government will share in a percentage of the cost of landscaping materials if individuals design and use water efficient landscaping. Contests with corporate and industrial entities can encourage participation from the corporate base. A program such as awarding a prize or rebate to the complex with the best landscape design that is water efficient is one such suggestion.

Education. See the section on Education and Awareness for tips to aid the municipal water user in improving outdoor water efficiency.

CASE STUDIES

A number of local governments through out Georgia and the United States have employed effective outdoor water efficiency programs. Below are some brief descriptions of some of these programs:

A. ***Xeriscape/Summer Intern Program*—Cobb County-Marietta, Georgia**[27] -Cobb County has had great success in the past few years instituting its water efficiency program. The program uses education and guidelines, instead of ordinances. One of the most effective programs that has been instituted, is the use of Landscape Water Efficiency Interns. The Cobb County-Marietta Water Authority hires landscape architecture or horticulture student(s) from the University of Georgia during the summer months. Students offer free consultation to residential water consumers about how to redesign their landscaping using the Xeriscape principles. As a result, the plants usually live longer, water bills are less, and the demand on the water supply during the peak summer months decreases. Other local utilities around the state have instituted similar programs with much success.

B. ***Landscape Guidelines*—Ventura County, California**[28] -In Ventura County in 1987, water efficiency guidelines, developed in cooperation with members of the green industry, were added to landscape guidelines. These guidelines are used by County planners in determining whether or not to approve landscape plans around the county. Though the guidelines do not prescribe specific limitations on the use of turf, they discourage excess use, and require that low-water use turf is used where large turf areas are proposed. Included in the guidelines are classifications of plants, which encourage the use of drought resistant plants. The developers in that area have worked willingly with the planning staff to implement such guidelines effectively.

C. ***Watering Time Restrictions*—Tampa, Florida**[29] -In Tampa, a program was designed by the water department which restricts the time of day that landscapes may be irrigated and prohibits water waste. The city water department works in conjunction with the South Florida Water Management District, a state agency, to effectively run this program. The city utilized press coverage and mass mailings in order to educate the public about this program. In addition to educating the public, a key factor in the success of this program has been active enforcement. The city has seven “water cop” employees who confirm citizen complaints about potential violations. These water cops may issue warnings and citations. For a first offense, a warning is issued; a second offense results in a $25 fine; the third violation fine is $50; and the fourth violation charge is $200. The city is considering whether water service should be turned off for those who violate the ordinance more than four times.

D. ***Incentive/Rebate Program*—Hays, Kansas**[30] -In 1991 in response to emergency drought conditions, Hays began a landscape rebate program. The program was designed with the cooperation of various county administrators and agencies in cooperation with members of the green industry, and is administered by the Parks Department. The Parks Department offers qualified property owners a 25% cost-share rebate, up to $500, for landscape materials. In order to become qualified, property owners are limited in using cool season turf for more than 40% of their landscape, because it requires more water. Some of the warmer climate turfs, like bermuda and buffalo grass, are not restricted. In addition, mulch is required around all accent plants. Applicants to the rebate program submit the plans for approval before the project is begun. Subsequent to the completion of the project, compliance with the approved plan is verified by a drive-by inspection by a parks department employee.

EDUCATION AND AWARENESS

Essential to implementing any new comprehensive program, like a water conservation program, is education and awareness. Letting people know about the benefits of, and need for, water conservation can help increase community interest and activism. Also it is beneficial to dispel myths that people may have about the implementation of a water conservation program. Running a water efficient home or business need not mean changes in quality of life. Below are a number of ways to increase public awareness and to educate the community.

Indoors

Educating people about some easy tips that they can use around the house and at work is one of the easiest ways to promote water efficiency. Many such techniques can be simple to implement, with little to no change in the quality of life. Such tips include steps that can be taken at home or at work, in the kitchen, in the bathroom and in the laundry room.

In the bathroom, simple things can be done to save water[31]:

- By putting a heavy glass jar in the toilet tank away from the moving parts the amount of water displaced with each flush can be dramatically reduced.
- Checking periodically for leaky pipes and toilets, and then correcting the problem, can help conserve water.
- Running faucets on low flow volume and turning them off when brushing teeth, shaving, and washing faces, can result in savings of two to three gallons per minute.
- By shortening shower times and only filling up the tub half way, significant amounts of water are conserved.[32]

In the kitchen, a number of other easy tips conserve water[33]:

- Keep a container of water in the refrigerator instead of waiting for cold water to run through the faucet. Three to seven gallons of water flow through faucets per minute.

- Vegetables and fruits can be cleaned in a pan of water using a vegetable brush instead of running the faucet.
- Allow defrosting food to thaw in the refrigerator instead of under running water.
- Run the dishwasher only when full.

The laundry room is another place where individuals can take steps to dramatically decrease the amount of water expended:[34]

- Run the washing machine only when it is full.
- Carefully select the correct clothes load size on washing machines so as to avoid using excess water.

Outdoors

The following are tips for the home or business owner that will increase the efficiency of outdoor water uses.

Encourage watering at the most beneficial times of the day. It is most efficient to water outdoor landscapes in the evening and early morning. Ideal watering times are between 9 p.m. and 9 a.m. During this window of time, plants are able to absorb required quantity of water with less water applied because less water is lost before absorption by evaporation to the sun.[35]

Educate users on the best ways to water.[36] By using a directional, hand-held hose for watering, one can achieve the best results for plants. There are some additional tips that will help consumers save water while providing better care for their landscape.

- **Avoid Shallow Watering**.[37] Frequent shallow watering creates shallow root systems and decreases the drought tolerance of plants. For effective results, water should be applied directly to the roots. Avoid watering the leaves and other foliage when possible, because this aids disease infestation, and more water is lost to evaporation.
- **Drip or Trickle Irrigation**[38] Drip or trickle irrigation provides a very efficient method for watering plants, using 50% less water than traditional sprinklers. Water is applied slowly and directly to the roots of the plants.
- **Timers**.[39] By installing a timer on outside faucets, the period of irrigation can be regulated, thus preventing unnecessary watering.

How to get the word out

Generally, a person or group within the community is identified to oversee outreach activities. This can be an existing group, a county extension official, or a member of the local government. A new group may also be formed. This could include representatives of different sectors of the community such as a homeowner, a small business owner, a teacher, a water authority, a local government official, a state government employee, etc. Unique to the Upper Etowah River Basin is the Etowah Alliance. This group is ideal for such a role because its members represent all five counties in the basin, numerous stakeholder groups are represented and the group is aimed at dealing with issues that span beyond county lines. So a water efficiency campaign may be an appropriate project for the Etowah Alliance.

There are numerous resources that aid in the dissemination of information. Several of these are listed below.

Media Coverage

Many people read their community newspapers and magazines. By providing the press with information and statistics

about any of the programs implemented, the public can learn more about the programs, the ways they work and how the community will benefit. Additionally, public service messages via public radio can offer people quick and easy tips.

Community Groups

Much like media coverage, discussions and informational sessions with local community groups can disseminate information through the community. Local politicians and volunteers can easily conduct seminars in such settings, as well as provide a means for distributing print materials, like pamphlets, on a large scale.

- *Speakers Bureau*—Through the Alliance speakers via volunteers, Alliance members, Extension Agents, and/or 4-H high school students can be trained to speak to the local community groups about water efficiency.

Round-table Discussion Groups

Bringing together representatives from the water authorities and other utilties, science directors of the school systems, and elected officials for discussions of water efficiency programs and efforts provides a great opportunity for the Alliance. Individuals can discuss the efforts that their organizations are making, while others can offer suggestions and support. (Rockdale County has successfully begun such a program).

Schools

Schools provide a unique opportunity to educate people as to water conservation. Programs available today provide teachers resource manuals, so that water conservation lessons through an integrated approach, using language arts, math, and science. Currently, The Water Sourcebook is available through the Georgia Water Wise Council for all grades levels, K-12. The Georgia Water Wise Council often works with local governments to help effectively use these books.

Pamphlets

A number of pamphlets are available through a variety of resources, including the Georgia Water Wise Council, University of Georgia's Cooperative Extension and the Rocky Mountain Institute, that offer consumers tips and advise in water conservation. An excellent way to distribute information in this format is by sending it as an insert in water bills.

Web Sites

For the computer literate, many web sites exist on the Internet which provide information and ideas on how to become water efficient. Also, developing and maintaining a web site specific to the Upper Etowah River Basin can aid in providing information to community members who are eager to learn more about water efficiency. Check out some of the following:

USGS Water Resources
http://water.usgs.gov

USGS Water Resources of Georgia
http://waterga.usgs.gov

Rocky Mountain Institute
http://www.rmi.org

EPA WAVE
http://www.epa.gov/owm/genwave.htm

Georgia Water Wise Council
http://www.griffin.peachnet.edu/waterwise/wwc.htm

Georgia Water Series
http://www.griffin.peachnet.edu/water

APPENDIX A
CONTACTS

Georgia Water Wise Council
1033 Franklin Road
Suite 9-187
Marietta, Georgia 30067-8004
Contact: Fox McCarthy (at the Cobb County-Marietta Water Authority)
(770) 426-8936 ext. 234

Environmental Protection Division (EPD)
Water Resources Branch
Department of Natural Resources
1152 East Tower
205 Butler Street, SE
Atlanta, Georgia 30334
(404) 656-4807
http://www.Georgianet.org/dnr/envrion/

Rocky Mountain Institute
1739 Snowmass Creek Road
Snowmass, Colorado 81654-9199
Contact: Richard Pinkham
(970) 927-3851
rpinkham@rmi.org

Chatham County Water Conservation Office
Contact: Mary A. Elfner
(912) 651-1440

Rockdale County Extension Service
Contact: Jule- Lynne Macie
(770) 785-5952
uga1247@uga.cc.uga.edu

Local County Extension Services:

Cherokee County
130 East Main Street
Canton, Georgia 30114
(770) 479-0418
Contact: Trudy T. Christopher, CEA

Dawson County
P.O. Box 128
Dawsonville, Georgia 30534
(706) 265-2442
Contact: W. Clark Beusse, CEA

Forsyth County
101 East Maple Street
Cumming, Georgia 30040
(770) 887-2418 or (770) 889-9345
Contact: Carol W. Propes, CEA

Lumpkin County
26 Johnson Street
Suite A
Dahlonega, Georgia 30533
(706) 864-2275
Contact: Gregory A. Sheppard, CEA

Pickens County
109 Depot Street
Jasper, Georgia 30143
(706) 692-2531 or (706) 692-3556
Contact: Richard C. Jasperse, CEA

Water Conservation Equipment Providers:

Amiad Water Systems Technologies
Phone: (805) 988-3323
Fax: (805) 988-3313
HTTP: http://www.amiadusa.com

Diamond Plastics Corporation
Phone: (308) 384-4400
Fax (308) 384-9345

Energy Technology Laboratories
Phone: (209) 529-3546
Fax: (209) 529-3554
Email: cs@savewater.com
HTTP: http:// www.savewater.com

F.S. Brainard & Company
Phone: (888) 388-3569
Fax: (609) 387-4304
HTTP: http://www.meter-master.com

Niagara Conservation Corp.
Phone: (800) 831-8383
Fax: (973) 829-1400

Radcom Technologies, Inc.
Phone: (617) 324-1300
Fax: (617) 324-8468
Email: radcom@ix.netcom.com

Water Management, Inc.
Phone: (703) 370-9070
Fax: (703) 370-9179
Email: watermgt@watermgt.com

APPENDIX B
SAMPLE ORDINANCE
OUTDOOR WATER EFFICIENCY
(A SAMPLE LANDSCAPE ORDINANCE)[40]

TITLE

1. AN ORDINANCE OF THE COUNTY OF _____ REQUIRING WATER-EFFICIENT LANDSCAPING (XERISCAPE) PRACTICES AND IRRIGATION SYSTEMS WHERE APPROPRIATE; BY PROVIDING FOR CONSISTENCY WITH STATE LAW AND THE COUNTY OF _____ COMPREHENSIVE PLAN; PROVIDING FOR PURPOSE AND INTENT; PROVIDING FOR DEFINITIONS; PROVIDING FOR CONFLICTS; PROVIDING FOR SEVERABILITY; PROVIDING FOR CODIFICATION; PROVIDING FOR ENFORCEMENT AND PROVIDING AN EFFECTIVE DATE.

SHORT TITLE

This ordinance shall be known and may be referred to as the County of _____ Water-Efficiency Landscaping Regulations.

AUTHORITY

This ordinance is adopted by the County of_____ under its home rule powers, its police powers to protect the public health, safety and welfare, and under powers pursuant to the authority granted by the state of Georgia.

ADMINISTRATIVE STANDARDS

Whenever, in the course of administration and enforcement of this ordinance, it is necessary and desirable to make any administrative decision, then, unless other standards are in this Ordinance, the decision shall be made so that the result will not be contrary to the spirit and purpose of this ordinance or injurious to the surrounding neighborhood or the community.

PURPOSE AND INTENT

The purpose of these regulations is to establish minimum standards for the development, installation, and maintenance of landscaped areas without inhibiting creative landscape design. This ordinance requires specific water conservation measures including the preservation of natural vegetation where applicable. Implementation will aid in improving environmental quality and the aesthetic appearance of public, commercial, industrial, and residential areas. It is the intent of this ordinance, therefore, that the establishment of these minimum requirements and the encouragement of resourceful planning be incorporated to promote the public health, safety, and general welfare in the areas of water conservation and preservation.

Creative site development concepts shall be used in order to promote water conservation. Water requirements may be reduced by providing for:

- The preservation of existing plant communities;
- The re-establishment of native plant communities;
- The use of water efficiency landscaping;
- Other environmentally sensitive site development concepts.

The land clearing/vegetation protection and preservation objectives are:

- To reduce the use of irrigation water in open space areas by promoting the preservation of existing plant communities;
- To prevent the removal of existing vegetation in advance of the approval of land development plans; and
- To prevent the removal of existing vegetation when no comparable vegetation plan has been prepared for the site.

To achieve the objectives of these regulations, this ordinance incorporates the seven basic principles of water-efficient landscaping. These principles, listed below with detailed explanation, are included within the general provisions section for the purpose of giving guidance and direction for the administration and enforcement of the regulations contained herein:

- Planning and Design
- Soil Analysis
- Appropriate Plant Selection
- Practical Turf Areas
- Efficient Irrigation
- Uses of Mulches
- Appropriate Maintenance

APPLICABILITY

The provisions of this ordinance shall apply to the development, redevelopment, rehabilitation, and maintenance of all property within present or future incorporated areas of the County of _____.

No permit shall be issued for the building, paving, or tree removal unless the water-efficiency actions included within the landscape plan comply with the provisions hereof; and no Certificate of Occupancy shall be issued until the requirements herein are met.

If the provisions of this ordinance conflict with other ordinances or regulations, the more stringent limitation or requirement shall govern or prevail to the extent of the conflict.

Specific application of the provision shall include, but not be limited to:

- All new redevelopment, or rehabilitated landscaping for public agency projects and private development projects including but not limited to industrial, commercial, and recreation projects;
- Developer-installed landscaping in single-family and multi-family projects;
- Any development approved prior to the effective date of this ordinance if the governing site development plan is amended;

Exempted from the provisions of this ordinance could include one or more of the following as applicable:

- Bonafide agricultural activities;
- Individual homeowner-provided landscaping for a single-family home or duplex;
- Any development which is governed by a valid site development plan or a valid building permit accepted prior to the effective date of this ordinance;
- Electrical transmission and distribution lines.

Conditional exemption may be granted by the permitting department of the County of _____ for individual projects if the applicant can demonstrate acceptable reasons for the requested exemption.

DEFINITIONS

For the purpose of this ordinance, the following words and phrases shall have the meanings respectively ascribed to them by this section.

All words used in the present tense include the future; all words in the singular number include the plural and the plural the singular; the word "building" includes the word "structure"; the word "shall" is mandatory and the word "person" includes a firm, corporation, county, municipal corporation, or natural person. The term "council" or "commission" shall mean Council or Commission of the County of _____, and the word "county" shall mean the County of _____ of the State of Georgia. The word "used" shall be deemed to include the words "arranged", "designed", or "intended to be used", and the word "occupied" shall be deemed to include the words "arranged", "designed", or "intended to be occupied". Any word or term not interpreted or defined by this section shall be used with a common dictionary meaning of common or standard utilization.

1. **Automatic Controller**. A mechanical or electronic timer, capable of operating valve stations to set the days and length of time of a water application.
2. **Emitter**. Devices which are used to control the applications of irrigation water. This term is primarily used to the low flow rate devices used in microirrigation systems.
3. **Ground Cover**. Plants, other than turfgrass, normally reaching an average maximum height of not more than twenty four (24) inches at maturity.
4. **Infiltration Rate**. The rate of water entry into the soil expressed as a depth of water per unit of time (inches per hour).
5. **Irrigation System**. A permanent, artificial watering systems designed to transport and distribute water to plants.
6. **Landscaped Area**. The entire parcel less the building footprint, driveways, non-irrigated portions of parking lots, hardscapes such as decks and patios, and other non-porous areas. Water features are included in the calculation of the landscaped area.
7. **Landscaping**. Any combination of living plants (such as grass, ground cover, shrubs, vines, hedges, or trees) and non-living landscape material (such as rocks, pebbles, sand, mulch, walls, fences, or decorative paving materials).
8. **Microirrigation** (low volume). The frequent application of small quantities of water directly on or below the soil surfaces, usually as discrete drops, tiny streams, or miniature sprays through emitters placed along the water delivery pipes (laterals). Microirrigation encompasses a number of methods or concepts including drip, subsurface, bubbler, and spray irrigation, previously referred to as trickle irrigation, low volume, or low flow irrigation.
9. **Mulch**. Non-living, organic or synthetic materials customarily used in landscape design to retard erosion and retain moisture.
10. **Native Vegetation**. See Vegetation, Native.

11. **Naturally Occurring Existing Plant Communities**. See Vegetation, Native.
12. **Pervious Paving Material**s. A porous asphaltic or concrete surface and a high-void aggregate base which allows for rapid infiltration and temporary storage of rain on, or runoff delivered to, paved surfaces.
13. **Plant Communities**. A natural association of plants that are dominated by one or more prominent species, or a characteristic physical attribute.
14. **Rain Sensor Device**. A low voltage electrical or mechanical component placed in the circuitry of an automatic lawn irrigation system which is designed to turn off a sprinkler controller when precipitation has reached a pre-set quantity.
15. **Runoff**. Water which is not absorbed by the soil or landscape to which it is applied and flows from the area.
16. **Site Specific Plant**. A selection of plant material that is particularly well suited to withstand the physical growing conditions that are normal for a specific location.
17. **Soil Texture**. The classification of soil based on the percentage of sand, silt, and clay in the soil.
18. **Turf and/or Turfgrass**. Continuous plant coverage consisting of grass species suited to growth in County).
19. **Valve**. A device used to control the flow of water in the irrigation system.
20. **Vegetation, Native**. Any plant species with a geographical distribution indigenous to all, or part, of the State of Georgia.
21. **Water Use Zone**. Any grouping of sprays, sprinklers, or microirrigation emitters so that they can be operated simultaneously by the control of one valve according to the water requirements of the plants used.

GENERAL PROVISIONS AND DESIGN STANDARDS

When the construction upon or the redevelopment of a new site or the redevelopment, reconstruction, upgrading, expansion or change in use of a previously developed site is such that site plan review is required, the provisions of this ordinance shall be applied to such site. Any such construction or development activity requiring said site plan or landscape plan which requires local approval shall be designed to be consistent with the water-efficient landscaping standards established herein and submitted in compliance with the requirements of state law.

A. **Planning and Design**
Site plans shall identify all vegetated areas to be preserved. Installed trees and plant materials shall be grouped together into zones according to water use needs. The water use zones shall correlate to the water use zone designations of plants listed in the Approved Plant List provided by the Water Wise Council. Plants with similar water and cultural (soil, climate, sun, and light) requirements should be grouped together and irrigated based on their water requirements. The water use zones shall be shown on the Landscape Plan. All newly installed plants require regular, moderately applied watering for the first year to become established. Installed trees and vegetation shall be spaced and

located to accommodate their mature size on the site. The Water Use Zones are as follows:

High Water Use Zone - An area of the site limited to a maximum of fifty (50) percent of the total landscaped area. Plants and turf types, within this area, are associated with moist soils and require supplemental water in addition to natural rainfall to survive. This zone includes shallow rooted turfgrass varieties.

Moderate Water Use Zone - Plants which survive on natural rainfall with supplemental water during seasonal dry periods. Thus zone includes deep rooted turfgrass varieties.

Low Water Use Zones - Plants which survive on natural rainfall without supplemental water. Because of the relatively high water requirements of turfgrass, no presently available varieties are included in this category.

B. **Soil Analysis**

Soils will vary from site to site even within a given site. A soil analysis based on random sampling is required and will provide information that will enable proper selection of plants and, if needed, soil amendments. When appropriate, soil amendments can enhance the health and growing capabilities of the landscape by improving water drainage, moisture penetration, and a soil's water and nutrient holding capacity.

A soil analysis satisfying the following conditions shall be submitted as a part of the Landscape Plan.

• Determination of soil texture, indicating the percentage of organic matter.

• An Approximate soil infiltration rate (either measured or derived from soil texture/infiltration rate tables). A range of infiltration rates should be noted where appropriate.

• Measurement of pH, and total soluble salts.

The soil tests may be done prior to submittal for permits. It is the responsibility of the applicant to have the soil test analyzed. The applicant shall deliver a copy of the "official" soil teat information tot he reviewing department or agency as part of the permit submittal. The applicant shall note on the specifications for soil amendments. When feasible, community generated solid waste compost material may be utilized.

C. **Appropriate Plant Selection**

Plant selection should be based on the plant's adaptability to the landscape area, desired effect, color, texture, and ultimate plant size. Plants should be arranged to achieve the aesthetic effect desired and, most importantly, grouped in accordance with their respective water needs. Maximum water conservation can be achieved by selecting the appropriate plants that require a minimal amount of supplemental watering.

Plant material shall be selected that is best suited to withstand the soil and physical growing conditions which are found in the microclimate of each particular location on a site. Plant species that are freeze and drought tolerant are preferred. Plants having similar water use shall be grouped together in distinct water use zones. Protection and preservation of native species and natural areas is encouraged.

D. **Practical Turf Areas**

The type and location of turf areas shall be selected in the same manner as with all the other plantings. Turf shall not be treated as a fill-in material but rather as a major planned element of the landscape. Since many turf varieties require supplemental watering at frequencies different than the other types of landscape plants, turf shall be placed so that it can be irrigated separately. While turf areas provide many practical benefits in a landscape, how and where it is used can result in a significant reduction in water use.

Turfgrass areas shall be consolidated and limited to those areas on the site that receive pedestrian traffic, provide for recreation use, or provide soil erosion control such as on slopes or in swales; and where turfgrass is used as a design unifier, or other similar practical use. Turf areas shall be identified on the landscape plan.

E. Efficient Irrigation

If a landscape requires regular watering or if an irrigation system is desired, the system should be well planned and managed. Water can be conserved through the use of a properly designed and managed irrigation systems.

The irrigation system shall be designed to correlate to the organization of plants into zones as described in (A) above. The water use zones shall be shown on the Irrigation Plan. Irrigation shall be required as follows:

High Water Use Zone - All portions of high water use zones shall be provided with central automatic irrigation systems.

Moderate Water Use Zone - All portions of moderate water use zones shall be provided with a readily available water supply within 25 feet.

Low Water Use Zone - All portions of low water use zones shall be provided with a readily available water supply within 50 feet.

Retained trees, shrubs and native plant communities shall not be required to be irrigated, unless directed to do so by the reviewing department for the successful establishment of the landscape area. Turfgrass areas shall be irrigated on separate irrigation zones from tree, shrub, and groundcover beds. Reclaimed or non-potable water may be used for irrigation if an acceptable source isdetermined to be available by the County Engineer.

Moistures sensor and/or rain shut-off switch equipment shall be required on automatic irrigation

systems to avoid irrigation during periods of sufficient periods of sufficient rainfall. Said equipment shall consist of an automatic mechanical or electronic sensing device or switch which will override the irrigation cycle of the sprinkler system when adequate rainfall has occurred.

The use of low volume emitters or target irrigation is required for trees, shrubs and groundcovers so as to minimize irrigation overthrow onto impervious surfaces.

F. **Use of Mulches**

Mulches applied and maintained at appropriate depths in planting beds will assist soils in retaining moisture, reducing weed growth, and preventing erosion. Mulch can also be used in places where conditions aren't adequate for or conducive to growing quality turf or ground covers. Mulches are typically wood bark chips, wood grindings, pine straws, nut gravel, and shredded landscape clippings.

A layer of organic mulch to a minimum depth of 3" shall be specified on the landscape plans in plant beds and around individual trees in turfgrass areas. Mulch shall not be required in annual beds.

G. **Appropriate Maintenance**

Proper landscape and irrigation maintenance will preserve and enhance a quality landscape. When the first six principles have been followed, maintenance is easier and less expensive than in traditional landscape. In addition, because water-efficient landscaping can be healthier than traditional landscaping and uses a minimal amount water, fewer fertilizer, pesticide, and other chemical applications are needed to maintain the plant material.

A regular maintenance schedule shall be submitted as part of the Landscape Plan.

Landscapes shall be maintained to ensure water-efficiency. A regular maintenance schedule shall include but not be limited to checking, adjusting, and repairing irrigation equipment; resetting the automatic controller according to the season; aerating and dethatching turf areas; replenishing mulch; fertilizing; pruning, and weeding in all landscaped areas.

Whenever possible, repair of irrigation equipment shall be done with the originally specified materials or their equivalents.

EDUCATION

To assist in public information, the education of its citizens, and the effective implementation of this ordinance, the County will coordinate its efforts with those efforts of the Department of Natural Resources, the Water-Wise Council, and the _____ County agencies. In conjunction with the agencies, the County will jointly sponsor regular workshops and/or short courses on the design principles and standards of water-efficient landscaping.

INCENTIVES

- Any licensed landscape professional or licensed irrigation or landscape contractor who attends a water-efficient landscaping workshop or short course which is sponsored or given by the County shall receive a _____% reduction of their occupational license fee upon their next

renewal date. Continued fee reductions of the same percentage will be credited based upon attendance at future continuing educational workshops or short course.

- Any development/landscape plan which incorporates the minimum water-efficient design principles and standards established by this ordinance will be granted special staff consideration and will be expedited through the landscape review portion of the site-plan review process.

- In addition to a streamlined processing, any development/landscape plan which exceeds the minimum water-efficient design principles and standards established by this ordinance will receive ____% reduction in the County permit application fee.

- Any individual home owner or resident who is not requires to submit a development/landscape plan, yet voluntarily applies the minimum water-efficient design principles and standards established by this ordinance will be eligible for a _____% reduction applied as a credit against their monthly water consumption charges, provided that the landscaped areas continue to comply with the minimum maintenance requirements and the total monthly consumption does not exceed _____ gallons.

ENFORCEMENT AND MONITORING

Implementation and enforcement of these regulations shall consist of:

A. **Certification**

A landscape architect licensed or certified by the State of Georgia shall conduct a final field observation and shall provide a certificate of substantial completion or demonstrate compliance of the ordinance to the County. The certificate shall specifically include reference to the landscaping, automatic irrigation system, the irrigation audit, and any other requirements of the County.

B. **Inspections**

The designated County inspectors shall be authorized and empowered to make inspections at reasonable hours of all land uses or activities regulated by this ordinance, in order to determine if applicable provisions of this ordinance and regulations relating to water-efficient landscaping are being followed.

Inspections may be without notice, and refusal to allow such an inspection shall be deemed a violation of this ordinance. Such failure to permit an inspection shall be sufficient grounds and probable cause for a court of competent jurisdiction to issue an administrative warrant for the purpose of inspecting, surveying or examining said premises.

In the event a building, structure, or land appears to be vacant or abandoned, and the property owner cannot be readily contacted in order to obtain consent for an inspection, the inspector may enter into or upon any open or unsecured portion of the premises in order to conduct an inspection thereof.

The inspector shall be provided with official identification and exhibit such identification when making any inspection.

It shall be the duty of all law enforcement officers in making

inspections when assistance is requested by the inspector.

C. **Notice of Violation, Notice of Hearing and Hearing Procedure**
Whenever the inspector determines that there is a violation of this ordinance, the officer or inspector shall follow the procedures established for bringing the case before the established enforcement body or shall seek injunctive relief as provided below. A notice to cease a land use activity or permit issued under this ordnance, shall not relieve the owner or operator of the obligation to comply with any other applicable state, regional, or local code, regulation, rule, ordinance, or requirement. Nor shall said notice or permit relieve any owner or operator of any liability for violation of such codes, regulation, rules, ordinances, or requirements.

D. **Injunctive Relief**
If any person engages in activities regulated by this ordinance without having obtained an approved permit as provided within this ordinance or continues in violation of the provisions of this ordinance or the regulation promulgated pursuant thereto, then the County may file an action for injunctive relief in a court of competent jurisdiction.

FEES

Permit Fees
Prior to the issuance of a permit, the applicant shall pay a fee as set forth by the Resolution No. _____ of the County of _____ passed on _____, 19__. Such fee shall be used to defray the cost of monitoring the compliance of this ordinance.

VARIANCES
Variances may be granted by Board of Adjustment in accordance with the state provisions and can attach conditions to variances granted.

VIOLATIONS AND PENALTIES
For any violation which does not constitute a threat to life or property, the County shall have the authority to issue a citation. The citation shall be in the form of a written official notice issued in person or by certified mail to the owner of the property, or to his agent, or to the person doing the work. The receipt of a citation shall require that corrective action be taken within thirty (30) calendar days, unless otherwise extended at the discretion of the County. If the required corrective action is not taken within the time allowed, the County may use any available civil or criminal remedies to secure compliance, including revoking a permit.

The County shall have recourse to such civil and criminal remedies in law and equity as may be necessary to ensure compliance with the provisions of this section of this ordinance, including injunctive relief to rejoin and restrain any person from violating the provisions of this section of this ordinance and to recover such damages as may be incurred by the implementation of specific corrective actions.

A conviction for violation of the provisions of this section shall be punishable by a fine or imprisonment as provided in the criminal statutes of the Georgia Code.

Any aggrieved party may appeal a decision by the County to the Superior Court.

CONFLICTS AND RELATIONSHIP TO OTHER LAWS

Whenever regulations or restrictions imposed by this ordinance conflict with other ordinances or regulations, or are either more or less restrictive than regulations or restrictions imposed by any governmental authority through legislation, rule or regulation, the regulations, rules or restrictions which are more restrictive or which impose the highest standards or requirements shall govern. Regardless of any other structure erected or maintained in violation of any state or federal pollution control or environmental protection law or regulation.

SEVERABILITY

This ordinance and the various parts, sections, subsections and clauses thereof, are hereby declared to be severable. If any part, sentence, paragraph, subsection, section or clause is adjudged unconstitutional or invalid, it is hereby provided that the remainder of the ordinance shall not be affected thereby. If any part, sentence, paragraph, subsection, section or clause be adjudged unconstitutional or invalid as applied to a particular property, building, or other structure, it is hereby provided that the application of such portion of the ordinance to other property, building, or structures shall not be affected thereby.

INCLUSION IN CODE, CODIFICATION, SCRIVENERS ERRORS

The provisions of this ordinance shall become and be made a part of the existing landscape regulations of the County of _____. Sections of the ordinance may be renumbered or relettered and the word "ordinance" may be changed to "section", "chapter", "article", or such other appropriate word or phrase in order to accomplish such intentions. Sections of this ordinance may require the correction of typographical errors which do not affect the intent. Such corrections may be authorized without the need of a Public Hearing, by filing a corrected or recodified copy of same with the clerk of the County of _____.

REPEAL

The existing regulations of the County of _____, being (chapter) _____ of the County Code as amended, are hereby repealed. The adoption of this ordinance; however, shall not affect nor prevent any pending or future prosecution of, or action to abate, any existing violation of said (chapter)_____, as amended, if the violation is also a violation of this ordinance.

APPENDIX C
SAMPLE ORDINANCES
INDOOR WATER EFFICIENCY

A. **Plumbing Fixture Efficiency Requirements Ordinance:**[41]

Section I: The …(existing section of the plumbing or building code regulating fixtures)…is hereby amended as follows.

Section III: APPLICABILITY

A. New and replacement fixtures:
The fixture performance requirements established in Section III shall apply to:
   1. Fixtures installed in new construction, and
   2. Replacement fixtures installed in any structure.

B. Mandatory Replacement of Existing Fixtures:
Existing fixtures that do not meet the requirements established in Section III of this ordinance must be replaced with fixtures meeting the requirements established in Section III of this ordinance, prior to:
   1. A change in ownership of real property, except when:
      a) the seller and the buyer certify that the property will be remodeled within 120 days of close of escrow, and
      b) that all fixtures not meeting the requirements established in section III of this ordinance upon completion of construction, and
      c) the new owner will allow inspection by an authorized agent of the appropriate enforcement authority; and prior to
   2. A change in use that requires the approval by the appropriate authority.

C. Sale of Fixtures:
All fixtures sold after 735 days of the effective date of this ordinance within the jurisdiction of the appropriate authority shall meet the standards established in Section III of this ordinance.

Section III: REQUIREMENTS
All plumbing fixtures covered under Section II of this ordinance shall be designed, manufactured, and installed, or, in the case of faucets but not in other cases, equipped with a flow restricting device and/or aerator, to meet the following requirements for water use at a static pressure of twenty (20) to eighty (80) pounds per square inch:

- Tank-type water closets shall not use more than 1.6 gallons per flush;
- Showerhead flow rates shall not exceed 2.5 gallons per minute;
- Faucet flow rates shall not exceed 2.5 gallons per minute when both hot and cold faucets are in full open position;
- Lavatory faucets in faucets in public facilities shall be equipped with automatic shut-off valves or shall have a flow rate of 0.25 gallons per minute or less, when both hot and cold faucets are in full open position;

- Urinals in public facilities shall not use more than 1 gallon per flush;
- Toilets and urinals in public facilities shall not be equipped with timing devices to flush periodically irrespective of demand;
- Flushometer type water closets shall adequately flush and clean fixtures and shall discharge no more than three (3) gallons per flush.

Section IV: EXCEPTIONS
The requirements established in Section III shall not apply:

- To fixtures used for sanitary or safety purposes in health care facilities;
- To fixtures used for safety purposes in facilities where hazardous wastes are present wastes are present and where health and safety might be adversely affected by limited flow rates;
- At the discretion of the appropriate authority, exemption from the requirements established in Section III may be granted in where the requirements would impose an unusual hardship, create a health hazard, interfere with use by the physically challenged, or would require replumbing, or in the instance of any other justifiable cause beyond the control of the builder. Exemption shall be granted in writing, after ____ days after the request in writing was received by the appropriate authority, and the cause for exemption or refusal shall be noted.

Section V: EFFECTIVE DATE
This ordinance shall become effective on _____(date).

B. RETROFIT DEVICE ORDINANCE[42]

Section I: APPLICABILITY

A. The requirements established in the ordinance shall apply to the following facilities, except as provided below in subsection (B):
   1. Apartment complexes with five or more rental units,
   2. Commercial buildings,
   3. Hotels and motels,
   4. Health and fitness centers,
   5. Schools, dormitories, and day care centers,
   6. Other institutional facilities,
   7. Shopping centers and malls, and
   8. All properties where there will be a change in ownership, except when:
      a) the seller and the buyer certify that the property will be remodeled within 120 days of close of escrow,
      b) that all the fixtures which do not meet the standards established in Section II of this ordinance will be replaced with fixtures meeting such standards of this ordinance upon the completion of the construction, and
      c) the new owner will allow inspection by an authorized agent of _____(appropriate enforcement authority).

B. Facilities may be exempted from some or all of the requirements below at the discretion of the _____(appropriate authority), provided that one or more of the following conditions applies:
    1. A particular fixture cannot be retrofitted to achieve further water use reductions or cannot be retrofitted without replumbing;
    2. Retrofitting a particular fixture would create a health or safety hazard;
    3. Retrofitting a class of fixtures cannot be done so as to ensure a two-year simple payback period, as determined by _____(appropriate authority).

Exemptions shall be granted in writing.

Section II: REQUIREMENTS:
All fixtures that do not meet the standards below shall be modified with retrofit devices or replaced to meet the following flow requirements at a static pressure of twenty (20) to eighty (80) pounds per square inch within 240 days of the effective date of this ordinance:

1. Tank-type toilets shall not exceed 3.5 gallons per flush;
2. Flushometer type toilets shall not exceed 3 gallons per flush;
3. Tank-type urinals shall not exceed 3 gallons per flush;
4. Flushometer type urinals shall not exceed 1 gallon per flush;
5. Showerhead flow rates shall not exceed 3 gallons per minute; and
6. Lavatory and Kitchen faucet flow rate shall not exceed 2.75 gallons per minute.

Section III: EFFECTIVE DATE
This ordinance shall become effective on _____(date).

FOOTNOTES

[1] The Water Program, Water Efficiency: AResource for Utility Managers, Community Planners and Other Decision Makers. Rocky Mountain Institute, 1991.

[2] Vickers, Amy. "Water-Use Efficiency Standards for Plumbing Fixtures: Benefits of National Legislation," AWWA Journal. May 1990.

[3] Art. III, § 2, cl. 2.

[4] Texas v. New Mexico, 462 U.S. 554 (1983).

[5] Carl Ehardt, "The Battle Over the Hooch; The Federal-Interstate Water Compact and the Resolution of Rights in the Chatahoochee River." Stanford Environmental Law Journal 200, 212 (1992).

[6] Connecticut v. Massachusetes, 282 U.S. 660 (1931); Nebraska v. Wyoming, 325 U.S. 589 (1945).

[7] Colorado v. New Mexico, 103 S. Ct. 539 (1982).

[8] Chaplin, Scott and Jim Dyer. "Water Efficiency as a Cost-Effective Supply Option." Rocky Mountain Institute.

[9] The American Water Works Association, Pacific Northwest Section , Water Conservation Committee, Water Conservation Guidebook for Small and Medium-sized Utilities (1993) at 4-3.

[10] the cost of new faucets and showerheads can be offset by water bill savings within 3 years, and the costs of new toilets can be offset within 6 years.

[11] The American Water Works Association, Pacific Northwest Section , Water Conservation Committee, <<Water Conservation Guidebook for Small and Medium-sized Utilities>> (1993) at 4-5.

[12] Id.

[13] Id.

[14] Id.

[15] The American Water Works Association, Pacific Northwest Section , Water Conservation Committee, Water Conservation Guidebook for Small and Medium-sized Utilities 1993, p. 4-5.

[16] The American Water Works Association, Pacific Northwest Section, Water Conservation Committee, Water Conservation Guidebook for Small and Medium-sized Utilities 1993. p. 4-6.

[17] The Bruce Company. Local Ordinances for Water Efficiency, Final Draft. March 31, 1993. p. 8

[18] The Bruce Company. Local Ordinances for Water Efficiency, Final Draft. March 31, 1993. p. 7

[19] Marshelia DeVan, et. al. "Community Development Water Conservation Program: Project Harambee". Proceedings of the 1995 Georgia Water Resources Conference. 1995. p. 281

[20] Id. The toilets used in this program were the 1.6 gallon per flush model manufactured in Atlanta by Toto Kiki, Inc.

[21] Id. The showerheads used in this porgram were the 2.5 gallon per minute showerheads manufactured by Niagra.

[22] The American Water Works Association, Pacific Northwest Section, Water Conservation Committee, Water Conservation Guidebook for Small and Medium-Sized Utilities. 1993. p. 3-9

[23] Brown and Caldwell. Cobb County-Marietta Water Authority Final Draft Report: Long-Range Water Supply Master Plan Update. October 18, 1996.

[24] Id.
[25] Fox McCarthy of the Cobb County-Marietta Water Authority.
[26] Id.
[27] Fox McCarthy of the Cobb County-Marietta Water Authority, and Brown and Cauldwell. Cobb County Marietta Water Authority Final Draft Report: Long-Range Water Supply Master Plan Update, October, 18, 1996.
[28] The Bruce Company. Local Ordinances for Water Efficiency, Final Draft. March 31, 1993. p. 21.
[29] Id. p. 26.
[30] Id.
[31] Cooperative Extension Service, The University of Georgia College of Agriculture. Conserving Water at Home. July, 1994.
[32] The American Water Works Association, Pacific Northwest Section, Water Conservation Committee, Water Conservation Guidebook for Small and Medium-Sized Utilities. 1993. p. 4-6.
[33] Cooperative Extension Service, The University of Georgia College of Agriculture. Conserving Water at Home. July, 1994.
[34] Id.
[35] "Outdoor Watering Tips" Available HTTP: http://www.altreg.com/H2Otips.htm. Last visited Sept. 19, 1998
[36] Gary L. Wade. "Coping with Watering Restrictions in the Landscape," The University of Georgia. 1996.
[37] Id.
[38] Id.
[39] Id.
[40] This Sample Ordinance was derived from the language of the Florida Sample Ordinance. This provides an example of the detail that such an ordinance may provide for if necessary.
[41] The Bruce Company. Local Ordinances for Water Efficiency, Final Draft. Appendix A, 1993.
[42] The Bruce Company. Local Ordinances for Water Efficiency, Final