Commenters on Drought Rule Strawman
July 15th Stakeholder Meeting

ACCG, GMA, GAWP
Athens-Clarke County
Cartersville
Cherokee County
Carnesville
Cobb County-Marietta Water Authority
Cobb County Water System
Columbia County
Columbus Water Works
Don North
Gainesville
Georgia Agribusiness Council
Georgia Green Industry Association
Georgia Mining Association
Georgia Paper and Forest Products Association
Georgia Poultry Federation
Georgia Power
Georgia Water Alliance
Georgia Water Coalition
Georgia Water Wise Council
Gwinnett County
Houston County
LaGrange
Metro District
Oglethorpe Power
Ron Rogers
Tim Thoms
Urban Ag Council

ACCG, GMA, GAWP

Cash, Tim

From: Edwards, Todd <TEdwards@ACCG.org>
Sent: Friday, August 15, 2014 12:41 PM
To: Cash, Tim
Cc: Pamela Burnett (pburnett@gawp.org); King, Ross; cfleming@gmanet.com; Lamar Norton; Jack Dozier
Subject: Drought Management Rule - Stakeholder Meeting #2
Attachments: GMA ACCG GAWP Joint Comments 8_14_2014.pdf

Tim:

Please find attached the joint comments of ACCG, GMA and GAWP on EPD's proposed revisions to Georgia's Drought Management Rule.

Thanks for allowing us this opportunity, and for your time and consideration.

Todd

Todd Edwards
Associate Legislative Director
404-522-5022
Tedwards@accg.org

ACCG is celebrating 100 years of advancing Georgia's counties! Learn more about ACCG's centennial celebration and how your county can get involved by clicking here.

August 15, 2014

Mr. James A. Capp
Chief, Watershed Protection Branch, EPD
2 Martin Luther King Jr. Drive, Suite 1152 East
Atlanta, Georgia 30334

RE: Drought Management Rule – Stakeholder Meeting 2

Dear Jac:

The Georgia Municipal Association (GMA), ACCG – Georgia's County Association and Georgia Association of Water Professionals (GAWP) appreciate the opportunity to review and comment on the proposed revisions to Georgia's Drought Management Rule. While we commend the Environmental Protection Division for their efforts in revising this rule, as required by law, we respectfully submit the following recommendations to ensure EPD meets the stated goal of assuring that public water systems maintain the ability to provide drinking water to meet public health needs during droughts.

Record Keeping and Reporting

There is no rational benefit to local governments or to EPD in requiring additional and seemingly duplicative reports of water utilities. Any additional information sought by EPD should be incorporated into the monthly reports already being submitted to EPD.

Drought Response Strategies

The drought surcharging program is unnecessary and of great concern to our members. Local governments currently have the ability to adjust water rates as appropriate to reduce water usage and/or ensure that our utilities remain solvent. The proposed state mandate sets a very dangerous precedent of encroaching upon local sovereignty. Water rate setting is a very complex and strenuous venture and can have an impact on repayment of bonded indebtedness. The adjustment of rates during droughts would be difficult (if not impossible) and controversial to implement. Furthermore, this surcharge will hurt those customers least able to pay, as well as businesses and industries struggling to keep costs low. Local governments have invested tremendous capital in their water utilities over the years to make Georgia's economic development possible. The state dictating or further regulating the rates that local governments charge to build, maintain

and operate this critical infrastructure is a great overstepping of bounds. ACCG, GMA and GAWP cannot over-emphasize the need to remove the proposed drought surcharging mandate.

The proposed drought water use restrictions are far too complicated and few among the public even comprehend the current rules. Adding new restrictions during various drought levels will only add to this confusion. In fact, these restrictions may well be ignored by the public and, thus, be counterproductive in protecting water supplies. Instead, local governments should continue to emphasize current restrictions during droughts by notification to customers, public education, media campaigns and enforcement. A consistent message about outdoor water use restrictions will be more effective in preserving water than fluctuating EPD directives. Any additional restrictions needed by a specific local government can be sought and granted through the variance process.

The Numeric Water Usage Reduction Targets of Drought Response Level 3 are aspirational. EPD stated in the stakeholders meeting that these targets are not permit limits and that local governments failing to meet them will not be deemed in noncompliance with their permits or the rules. Consideration should be given to allow local governments to develop alternate targets based on return flows to a water supply or based on net per-capita consumption. Therefore, at a minimum, we suggest that the following statement be added to the proposed rule revision in paragraph (e): "Failure to achieve a Numeric Water Usage Reduction Target is not a violation of a permit, rule or law." Given that an unenforceable target in a rule is generally not good public policy, the best option is to remove the target reductions from the rule altogether.

Applicability

EPD explained in the stakeholders meeting that agricultural water usage will remain exempt from the drought rule's water restrictions. Instead, EPD noted, this issue will be addressed in the upcoming Flint River Drought Protection Act rules. Agricultural water usage in the Chattahoochee and Flint River Basins contribute to additional releases from Lake Lanier during drought periods in order to maintain instream flows in the lower Chattahoochee and Apalachicola Rivers. Lake Lanier is essential for drinking water supply for millions of Georgians. The agriculture community has a recognized responsibility, along with local governments, to reduce water usage during these drought times to preserve Lake Lanier. Therefore, the upcoming Flint River drought rules for agriculture should have provisions for reduced agricultural usage during drought periods similar to the 15-percent target reductions proposed for local governments. Or, as stated previously, the target water reduction levels for local governments should be deleted, thus removing the inconsistency between the proposed drought management rules for local governments and the forthcoming rules for agriculture. All must do their part to preserve this vital resource to ensure that public health and safety are protected, particularly during drought. Placing water restrictions solely on local government providers (and those industries and other uses that rely on them) is mere window dressing, places disproportionate hardship on these users, and is counterproductive to achieving needed results.

Implementation

The proposed rule does not address the degree of implementation of drought response strategies by local governments. Each local government is distinct in its available staff, priorities, water resources, and drinking water treatment and distribution system capacity. Therefore, we appreciate this flexibility and believe it appropriate. However, the rules should contain a minimum level of implementation by local governments. There should be public education and customer/media notification during droughts. Local governments should have the discretion to implement and enforce their ordinances as they determine best for their water availability situation. The Water Stewardship Act requires the adoption by local governments of ordinances consistent with the Act and language related to adoption of ordinances in the proposed rule is superfluous.

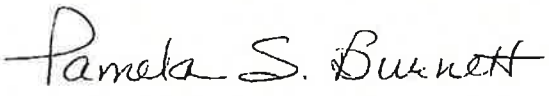
Stakeholders Meetings

The above suggestions reflect the primary concerns shared by GAWP, ACCG and GMA with the proposed rule. We strongly encourage at least two additional stakeholder meetings and two additional rounds of draft rules take place prior to EPD issuing formal public notice on the proposed rule revision. We will respectfully offer more detailed recommendations for enhancement during these periods.

Thank you for your valued time and consideration.

Lamar Norton,
Executive Director
Georgia Municipal Association

Ross King,
Executive Director
ACCG – Georgia's County Association



Pamela Burnett,
Executive Director
Georgia Association of Water Professionals

Athens-Clarke County

Cash, Tim

From: Marilyn.Hall@athensclarkecounty.com
Sent: Friday, July 25, 2014 11:23 AM
To: Cash, Tim
Cc: Gary.Duck@athensclarkecounty.com
Subject: Drought Management Rule - Stakeholder Meeting #2
Attachments: Athens state drought rules comments July 2014.pdf

Tim,

I have attached Athens-Clarke County's comments on the "Drought Rule Strawman (Revised 7/3/2014)". Thanks for the opportunity to comment. We are very concerned over some of the Rules and hope you will seriously consider our submittal.

Thanks.

Conserve: WATER u waiting 4?

Marilyn Hall, AICP
Water Conservation Coordinator
Public Utilities Department
Unified Government of Athens-Clarke County, GA
124 East Hancock Avenue
Athens, GA 30601

Office: (706) 613-3729
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Areas of concern regarding the Proposed Drought Rules
July 25, 2014
Submitted by Marilyn Hall, Athens-Clarke County Public Utilities Department

Drought Surcharge

The Proposed Rules require Drought Surcharge Pricing at Level 2 and Level 3. This would be the first time that state regulators dictate a local government's water rates and this sets a dangerous precedent. The State does not have the resources to perform the kind of analysis needed to set responsible rates and fees for each utility. The financial needs and elasticity of water demand varies significantly from utility to utility. Suggesting that each utility must implement a drought surcharge ignores the fact that many utilities already have a rate structure in place that encourages conservation. The elasticity of demand varies from place to place and is extremely difficult to predict with any accuracy. The Rules require that the drought surcharge be "revenue neutral", an impossible task without knowing the elasticity of water demand.

Additionally, drought surcharges are not appropriate conservation strategies for many utilities, especially the utilities that already have aggressive conservation rate structures. Athens-Clarke County already places a premium on water use above the winter average. Our rate structure combined with an active conservation program has dramatically reduced our summer peaking factor. A surcharge would probably not change residential water demand here very much and it would harm our commercial and industrial users who already conserve. We should be able implement our own conservation strategies during drought. They would be much more effective for us.

Level 3 is the only time where actual water use reductions are required: a 10% reduction in off-peak months and 15% reduction during peak months. Level 3 also requires drought surcharges consistent with such reductions. Logically it follows that the Proposed Drought Rules rely primarily on surcharges to reduce water demand. Is that the intention of the surcharge? If it is, why require additional outdoor restrictions? Also, each utility has a unique peaking factor. Areas with a very low peaking factor will be affected more by this requirement. For example, in Athens-Clarke County we have successfully reduced our peak so much that if you decrease our water use 10% in off-peak months and 15% during peak months, our peak is nearly eliminated which is an unattainable goal.

Finally, if reduction targets don't start until Level 3, why are surcharges required in Level 2?

Confusing and Inconsistent Reduction Targets

Level 3 is the only Level with required reductions in water use. A base of 10% during off peak use and 15% in peak months is required. However each utility will make adjustments to their reduction target based on their Water Supply and Demand Analysis Worksheet. Reduction target adjustments are based on

- A comparison between the permittee's current withdrawals and percentage of streamflow during the 2007-2008 drought,
- Their ILI and validity score from the Annual Water Loss Audit, and
- How old their housing stock is.

Neighboring utilities could have as much as a **12.5% difference** in their required reduction requirements. Different targets will be difficult to explain to customers and other stakeholders.

Additionally, using a system's ILI and Validity Score to modify reduction targets and ignoring other efficiency factors hurts utilities with good conservation programs. If system efficiency is a factor, other factors of efficiency should be considered as well. For example, residential per capita water use should also be considered. Many utilities have invested in demand management and conservation programs to reduce per capita water use, improving end-user efficiency. These efficiencies should benefit the utility as much as a good score on the Water Loss Audit. The Water Use Efficiency Reporting Forms that GAWP and EPD is developing should be used to ensure uniform reporting and calculations of residential per capita water use.

Monthly submittals of non-drought forms

Information in the Monthly Water Use Reporting Form is already being turned in by utilities and collected by EPD on a monthly basis. Submitting the form every month to EPD is redundant and a waste of time and resources. The "Drought Reporting Form" uses data from the monthly form to calculate the Drought Response Level 3 Reduction Target. Water usage data in the Monthly Reporting Form should be submitted during a drought along with the "Drought Reporting Form". The two are designed to go together and it makes sense to keep them together and only turn them in during drought.

Other Concerns

"Irrigation of recreational turf" is a "Farm Use" and is exempt from all restrictions. There should be no end-users of a municipal water system that are exempt from drought Rules. Irrigation of recreational turf should not be more important than ensuring adequate supplies of drinking water.

The Rules do not spell out the drought triggers in detail. It lists possible indicators and agencies, but not actual triggers. For example, it lists "Soil Moisture" but not how dry it has to be before a drought is declared. Having triggers defined in advance will help water managers prepare for the drought declaration.

Does the odd/even schedule for other water uses still apply? The current non-drought schedule is already very confusing. It would be very helpful for EPD to clarify what the Rules are for other water uses. For example, when can residents fill pools during non-drought periods and during the various levels of drought?

Carnesville

Cash, Tim

From: Harris Little <mga60@yahoo.com>
Sent: Thursday, July 17, 2014 4:12 PM
To: Cash, Tim
Cc: cfleming@gmanet.com
Subject: Drought Management Rule Stakeholder comments

Dear Mr. Cash:
I appreciate the opportunity to comment during this process. My comments are concerning the HUGE disconnect between rainfall/drought conditions and water systems having adequate water supply. During the last drought our water system, City of Carnesville, I'm the Mayor by the way, never ever experienced a reduction in our water supply. We did have a spring that we use for a good bit of our produced water see a fall off in output but it could always be more than compensated for by our interconnections with Franklin County's water system and further with their interconnection with the City of Toccoa. Both Franklin County and the City of Toccoa operate systems at daily production levels far below permitted capacity. So I see no reason that our system or any other system that is in a similar circumstance should be required to restrict water use when they have all the water they can sell.
My main point is this - Drought conditions do NOT necessarily mean reduced water supply for some systems. This one size fits all approach is bad business and bad policy. Some systems have debt service requirements that can be a hardship if the State starts telling them you have to reduce what you sell when the have a more than ample supply.
I see no reason that the State, without knowing anything about an individual systems resources should try to require anything of the system. Why not let each system manage their business as they see fit. After all the people running the system know if they have a supply problem or not.

Please don't try a one size fits all approach.

Thanks, Harris Little, Mayor, City of Carnesville

Cartersville

Cash, Tim

From: Bob Jones <bjones@cityofcartersville.org>
Sent: Tuesday, August 19, 2014 11:44 AM
To: Cash, Tim
Subject: Drought Management Rule - Stakeholder Meeting #2
Attachments: City of Cartersville - Drought Management Rule Comments.pdf

Tim,

Please find the attached comments per the information and discussion at Meeting #2. A hard copy is being mailed to the provided address today as well.

Thanks,

Bob Jones
Cartersville Water Department
770-387-5653

City of Cartersville
WATER DEPARTMENT

August 18, 2014

Mr. James A. Capp
Chief, Watershed Protection Branch - EPD
2 Martin Luther King Jr. Drive
Suite 1152 East
Atlanta, GA 30334

Re: Drought Management Rule Comments

Dear Mr. Capp,

Thank you for the opportunity to comment early in the development of the Drought Management Rule. I hope that the following will be useful to you and your staff in developing an effective rule that will benefit all interested parties. The comments below are based on information presented at the Georgia EPD Drought Management Rule Stakeholder Meeting #2 – July 15, 2014. For ease of reference to the material provided at that meeting, comments are formatted as follows:

SLIDE TITLE – SLIDE SUBTITLE
"Specific bullet point or statement on referenced slide"

Comment text

WELCOME & INTRODUCTION – OVERVIEW AND PURPOSE OF STAKEHOLDER MEETING

"This meeting is responsive to OCGA 12-5-7 and 12-5-8 and other Georgia Code sections charging EPD with the responsibility to ensure that water resources are responsibly conserved"

The charge given to EPD is no doubt needed especially in time of drought. I think everyone can agree on this point. However, I doubt any two people could agree completely on what "responsibly conserved" actually looks like. This is not because one person is rational and the other not, nor because one is reasonable and the other not, but because of the uniqueness of each system and the infinite number of variables one must weigh to arrive at a responsible decision.

Spending time defining what "responsibly conserved" actually means will be very beneficial to all parties. The infinite variables will always create ambiguity ("grey areas") when trying to achieve even a well-defined goal. Knowing as much detail about what EPD considers responsible conservation and leaving room for each system to make their case on what is responsible for their community is critical.

PRIMARY GOALS OF RULE – PRIMARY GOALS:

"Protect water supplies in order to ensure that public water systems have sufficient water to meet public health needs during droughts"

The key term in that statement is "systems". Webster's Dictionary defines the word as follows: System – a set or arrangement of things related so as to form a whole. During our last drought, supply seemed to be the sole focus of all effort. Do anything and everything to keep that lake ring from growing or that stream flow from decreasing. Supply is only one part of the system.

One of the unintended consequences of the "supply focus" approach was the financial crippling of many water systems in the state. At the Governor's request for a 10% reduction in water use, our customers cut water consumption by 20.8% during the period of 2006 to 2013. During this eight year period, revenue has grown by an average 0.28% while implementing an average 4.01% rate increase during each of those years. Net available revenue (Net Available Revenue = Total Revenue – Operating Expense) which is the revenue that pays for capital improvements shrank during the same time period by 75%. Operations produced $4,000,000 of net available revenue in 2006 and $1,000,000 in 2013. This reduction was the result of additional debt service for one capital improvement project to our wastewater plant coupled with flat revenue for eight years. Once customers learn to conserve, the demand does not come back. That is fantastic for supply preservation, but disastrous for maintaining a treatment and distribution system.

The treatment and distribution parts of the system are being starved of needed resources to repair and/or maintain these essential components. Annual rate increases of >8% are just not going to happen in our system. At some point, public health needs can and will be impacted by this factor as much as they would by a lack of water to treat. Is anyone asking where the limit of demand suppression is? Are we getting close? Do we really think that we can just keep cutting 10 – 15% more each time a drought occurs?

DROUGHT INDICATORS & TRIGGERS

"The Director shall monitor climatic indicators and water supply conditions as needed to assess drought occurrence and severity, and its impact upon the ability of permittees to provide adequate supplies of water and avoid or relieve local water shortages."

What is adequate? Can it be quantified? In quantifying or defining what adequate actually is, we can plan and model what our exposure as a system might be under certain conditions. Will adequate be the same from drought to drought or will it change based on conditions on the ground at the time?

DROUGHT DECLARATION

"Based on climatic indicators and water supply conditions, the Director may declare various drought levels for specific areas – 3 Levels (Level I, Level II, Level III)"

The reduction in use from Level II to Level III is pretty dramatic. From Level I to Level II there is a four hour reduction (33%) in allowed watering time. From Level II to Level III the reduction is eight hours (100%). The addition of another level seems to be in order. A Level III with another four hour reduction (50% of Level II) seems about right. Escalation to a higher level or skipping a level if conditions warrant would always be a possibility.

DROUGHT RESPONSE STRATEGIES - OVERVIEW

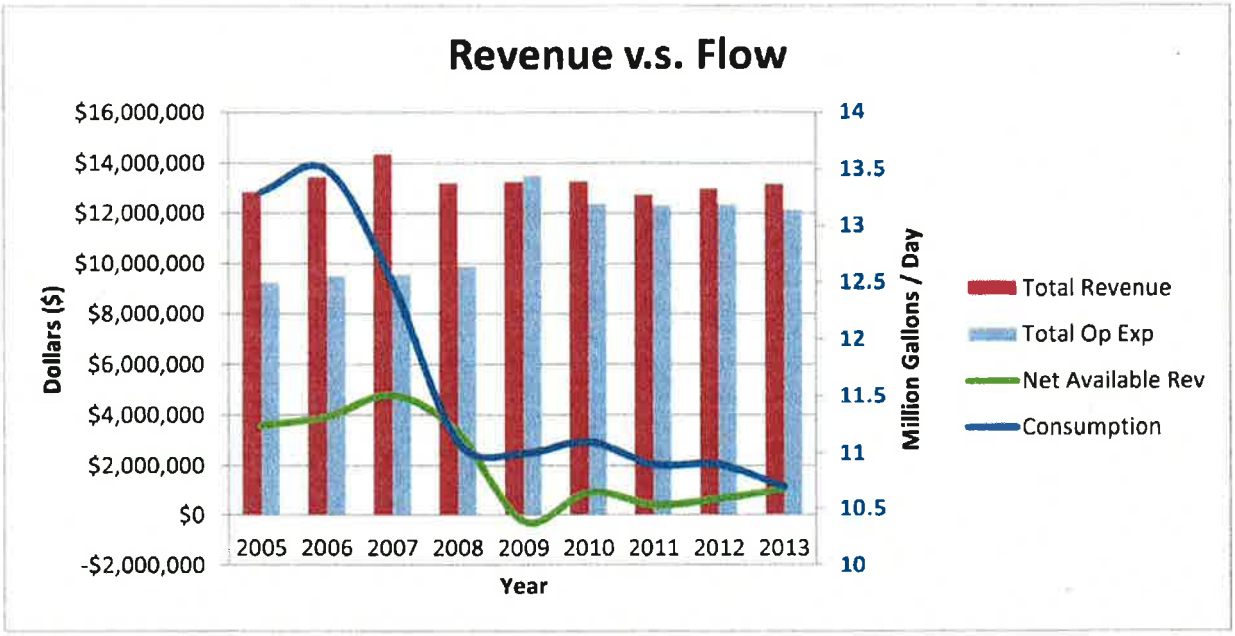
"Level 3 drought triggers numeric reduction targets"

This slide and the discussion around it indicate that the 10/15% reduction values are targets or goals. The supplied "Stakeholder Draft Only – Not An Official Draft" copy of Chapter 391-3-30 Rules for Drought Management states in 391-3-30-.08-(4)-(e) Numeric Water Usage Reduction Targets that the "permittees who are public water systems and whose monthly average water use is one million gallons per day or greater **shall** achieve a 10% reduction in monthly average water use....." This language sounds like more of a mandate rather than a goal. Which one is it?

DROUGHT SURCHARGE PROGRAM

"(iv) Shall be approximately revenue neutral relative to the water usage reduction goal and pre-drought revenues"

This one scares me. Revenue neutral is exactly what we did in the last drought and we are barely hanging on financially. Below is a historical look at financial and demand metrics from the last drought:



Tiered rates were introduced in July 2007. These rates were introduced to comply with the Metropolitan North Georgia Water Planning District mandate and to bolster sagging revenue from earlier drought based reductions. Rates were increased by 100% in tier II and 208% in tier III in September of 2007. A fourth tier was added in April of 2008 for all residential consumption over 15,000 gallons which was set at 500% of tier I. All of this resulted in the graph above – revenue neutral. That revenue neutral policy has resulted in a permanent 20.8% reduction in consumption and revenue growth of just 0.28% over the 2006 to 2013 time period.

Unfortunately, we have found no ability to implement an "expense neutral" program that freezes operating expenses. Per the AWWA M1 Manual page 184:

> ***Additional and/or deferred expenses.*** *A drought response often requires additional expenses beyond the anticipated revenue requirement and may at the same time require the deferral of other anticipated expenses within the utility's revenue requirement. The additional expenses may be a function of the need to obtain additional and costly water supply, additional pumping costs, and so forth. In addition, expenses may be incurred to impose water-use restrictions in the event that the utility elects active enforcement of its rules. The utility will also likely incur additional costs associated with public outreach and communication. The drought management plan may have estimates of the unplanned expenditures for each drought stage. At the same time, capital projects may be postponed or deferred during a drought to help preserve cash flow and reserves.*

The deferral of expenses and postponement of capital projects can be done for a year or two, but when demand does not recover and revenue stagnates, net available revenue shrinks. The reduction of net available revenue for investment in capital improvements such as pipe replacement, plant maintenance and leak detection programs gets deferred indefinitely.

If we had followed the M1 Manual to the letter and set a base rate with a separate drought surcharge tied to the declared drought level as suggested, we would still have had to aggressively increase base rates in the post drought period to remain revenue neutral. Why? Because the assumption that a drought surcharge is a short term "tool" to temporarily suppress demand has not been our actual experience. Were we to have a short drought (one summer), usage patterns would not change. What we are planning for with this rule is a multiyear drought. One in which surcharges, whatever their form, will be in effect for at least a year - quite possibly longer. Surcharges of this duration do change use patterns which have permanent negative effects on revenue.

Additionally, this event has permanently skewed our rates. Water rates were increased not only to offset lost water revenue from reduced consumption, but also lost sewer revenue. It did then and does now seem counterintuitive to have a drought surcharge on sewer, but that is what it will take to truly achieve a revenue neutral result.

PARTING THOUGHTS

- *Smart Metering Technology* – As detailed above, rates were the single most effective tool we found for suppressing demand during the drought. Smart metering would allow a new level of rates and control by opening the ability to deploy "time of use" water rates similar to electric utilities. Additionally, smart metering would allow enhanced enforcement of drought restrictions. Customers would quickly learn that the meter time stamps readings and there would be no argument about when water was used. There would always be the argument over if the use was for an exempt activity, but the main deterrent would be in knowing that the meter is watching.

  Grants or extremely favorable financing (≤ 1%) for these projects would be very helpful. In the current environment of flat revenue and rising costs, taking on a $4,500,000 meter change out program in the face of tens of millions in distribution infrastructure and plant upgrades for nutrient removal is virtually impossible.

- Once we reach the limits of discretionary use, who will be responsible for economic losses as a result of required curtailments? If a factory has to shut down a shift to meet the 10/15% reduction goal/mandate, they are likely to look for compensation. Many of our industries would be looking for $50,000 or more per shift based on a recent claim that shut down a plant when a water main was damaged by a contractor working without a locate. Should there be some form of legal/financial indemnification for local water providers during a declared drought to protect them against such claims?

Thank you again for the opportunity to comment and give perspective from the provider point of view. If you have questions or would like further information on any topic discussed above, please feel free to contact me at any time. Rest assured I do not envy you the task of creating this rule. I believe your early solicitation of comments is an indicator that the process is starting in the right direction.

Respectfully submitted,

Robert S. Jones
Director
Cartersville Water Department

Cherokee County

Cash, Tim

From: David Kubala <dkubala@earthlink.net>
Sent: Tuesday, July 29, 2014 7:58 AM
To: Cash, Tim
Cc: Turner, Jud; James A. Capp; Pennington, Russ; Caldwell, Nap; Champion, Becky
Subject: Drought Management Rule - Stakeholder Meeting #2
Attachments: CCWSA Drought Mgt Rules Comments 7_29_2014.pdf; ATT00001.htm

Tim,

The attached document contains Cherokee County Water & Sewerage Authority comments on the Stakeholder Draft Rules Relating to Drought Management, Chapter 391-3-30. A hard copy is being mailed to James A. Capp. Contact me if you have questions.

Thanks,

David

David Kubala
Environmental Affairs Manager
Cherokee County W&SA
PO Box 5000
Canton, Georgia 30114
Office: (770) 479-1813 ext.248

Cherokee County Water & Sewerage Authority

July 29, 2014

James A. Capp, Chief
Watershed Protection Branch, EPD
2 Martin Luther King Jr. Drive, Suite 1152 East
Atlanta, GA 30334

RE: Drought Management Rule – Stakeholder Meeting #2

Mr. Capp:

We appreciate this opportunity to offer comments on the Stakeholder Draft Rules Relating to Drought Management, Chapter 391-3-30.

The majority of the straw man is encompassed by section 391-3-30-.08, Drought Response Strategies, so it is there that we begin our comments.

At the broadest level there are but two ways to prepare for and survive intermittent drought conditions. You either enlarge/fortify your water resources to improve drought resistance, or you increase water use efficiency to stretch current supplies to improve drought resistance; the truth is that both must be done simultaneously.

Both efforts must be deliberate, continuing and long-term. No short-term drought response measure(s) implemented after drought conditions are being experienced will long prevent dire consequences in the poorly prepared system. Those same short-term drought response measures fail to give credit to those systems that have effectively prepared for intermittent drought conditions.

We recommend that the final Drought Management Rules do not include numeric reductions goals/percentage reductions or a drought surcharge requirement.

There is no supporting data that demonstrates 10%-15% reduction will be sufficient for the preservation of adequate water capacity to survive a persistent level 3 drought. The given percentages may be draconian in the case of water systems that have superior water conservation/efficiency programs in place. The given percentages may be of no effective consequence to other systems whose conservation/efficiency programs are in the infant stage.

Percentage reductions are inherently unfair since the concept makes the assumption that all systems are the same; there is no accounting for the different starting conditions of each water system.

The Numeric Water Use Reduction/Percentage approach creates a perverse incentive to maintain an inefficient and wasteful system so the system can easily

meet the arbitrary percentage reductions in a drought. It is far better to encourage efficient systems throughout the state than to have drought response reduction percentages.

The broader ideas that appear to be behind surcharge pricing and numeric water use reduction can be accomplished by a two-fold approach within the rules.

First, use the performance standards offered under Drought Levels 1, 2 and 3 minus the Drought Surcharge Pricing and Numeric Water Use Reduction Targets language. Once a water system has banned outdoor water uses per Level 3 Drought response, with the exception of those uses protected statutorily, there is little else it can do in the short term to force water use reductions, especially if further reduction depends primarily upon changes in usage patterns within the home, other than appealing to the customers' sense of civic duty. Public service messages and public education efforts at the local level can promote this sense of civic duty. Public education is addressed, among other measures in the next paragraph.

Second, require all systems to report to EPD on their system's implementation of the following basic conservation, efficiency improvement and public education measures when a Drought Level 2 is declared.

1. Establish conservation pricing by all local water providers.
2. Implement education and public awareness plan.
3. Assess and reduce water system leakage.
4. Distribute low-flow retrofit kits to residential users.
5. Conduct residential water audits.
6. Replace older, inefficient plumbing fixtures.

Language such as the following paragraph from the conservation pricing guidance document of the Metropolitan North Georgia Water Planning District has value in setting local rates that are effective in addressing volumetric use declines due to conservation measure(s) implementation as well as volumetric declines due to mandatory short-term drought reductions, primarily from outdoor watering restrictions. <u>This is an alternative, and permanent, method to accomplish the idea behind drought surcharges, which is to account for lost revenue due to water use restrictions during a declared drought.</u>

"The result of successful conservation pricing is that customers become more efficient in the use of water. This generally means customers use a smaller volume of water compared to a similar time frame before conservation pricing. For the utility, this means a reduction in revenue, and it may mean a revenue stream that is less

predictable for coverage of a utility's fixed costs. Fixed operations and maintenance costs are those costs that do not vary with the volume of water produced, such as personnel, billing, meter reading, and repayment of bonds or loans. Fixed costs are, on average, a majority of the O&M costs of the average utility. A base service fee that does not include any volume of water is one approach to reducing the volatility of the revenue stream.
A base service fee, sometimes called a base rate, fixed rate, service availability fee or other name, is used in rate structure design to produce a reliable revenue stream that covers most, or all, of the utility's fixed O&M costs. The base service fee is charged to each customer every billing period, regardless of the volume of water the customer actually used, even if that use was zero. The base service fee is a useful tool well worth considering when adjusting or redesigning your rate structure."

This two-fold drought response will result in real long-term improvements to drought resiliency for all water systems in Georgia, leaving only the planning for and development of additional water resources at the local level to fortify the water supply against intermittent drought conditions.

Additionally, to address actions in the event of a drought that is more severe than Level 3 calling for rationing or other emergency measures to assure basic water needs, we suggest that EPD reiterate within the new drought rules the following water use priorities that are part of both 391-3-2-.04 and 391-3-6-.07:

1. Emergency facilities for essential life support measures;
2. Domestic and personal uses, including drinking, cooking washing, sanitary and health related;
3. Farm uses;
4. Industrial uses;
5. Other uses such as lawn sprinkling, non-commercial car washing, garden watering, etc.;
6. Outdoor recreational uses.

Comments and observations about the current straw man draft follow below:

1. In section 391-3-30-.05 we recommend the end of the second sentence stating, "... and their impact on the ability of permittees to provide adequate supplies of water within the affected drought areas and avoid or relieve local water shortages", be deleted as unnecessary since it assumes EPD has a high degree of familiarity with the pre-drought mitigation strategies employed and their degree of implementation in every system within the area of the declared drought. We do not believe this to be the case.
2. Section 391-3-30-.05 lacks specificity on how the level and measurement of the drought indicators and triggers of section 391-3-30-.04 will be interpreted by the Director in the decision to declare non-drought or drought conditions. We support the Director having a level of discretion in this matter, but the current language leaves the decision criteria nebulous and

offers little way for the Director's decision to be critiqued or challenged. This could open the door for abuse by future directors of EPD.

3. Among other things O.C.G.A. § 12-5-8 calls for a Drought Response Committee and for state and local pre-drought mitigation strategies. Section 391-3-30-.06 seems inconsistent because most would understand drought response to constitute what happens after a drought has been declared. Pre-drought strategies are those long-term preparatory actions that happen during non-drought conditions. We recommend that a Drought Preparedness Committee to address pre-drought measures additionally be called out in the rules, if possible, to assure the proper focus of the two distinct activities. The participants of the two committees may differ to account for necessary expertise.
4. The additional reporting of Section 391-3-30-.07 is unnecessary since EPD already receives monthly operating reports for each system that include the data asked for under this section. Additionally, if the alternate approach explained above is used, this section is rendered unnecessary. To the extent EPD is determined to require repetitious reporting, it should require it of all water systems, not just those using 1 MGD and above.
5. Part (5) under section 391-3-30-.08 Drought Response Strategies exempts industrial and commercial permittees from the provisions of the new drought rules, they simply have to,follow the drought contingency plans that are part of their water withdrawal permits issued pursuant to the Georgia Water Quality Control Act and Groundwater Use Act. Drought contingency plans are also required of public water systems per the same acts. Please explain why EPD proposes to treat public water system permittees' drought contingency plans and industrial/commercial permittees' drought contingency plans differently in the proposed drought management rules.
6. Section 391-3-30-.09 will need extensive re-writing or may be essentially unnecessary if EPD uses the proposed changes detailed above.
7. Please clarify what language in 391-3-6-.07 and 391-3-2-.04 are proposed to be changed/added/deleted. The descriptions on pages 9-10 of the straw man lack clarity.

Thank you again for the opportunity to offer comments on the Stakeholder Draft Rules Relating to Drought Management, Chapter 391-3-30.

Sincerely,

David Kubala, Environmental Affairs Manager

Cc: CCWSA Board of Directors
Thomas A. Heard, CCWSA General Manager

Cobb County-Marietta Water Authority

Cash, Tim

From: Glenn Page <gpage@ccmwa.org>
Sent: Tuesday, August 19, 2014 9:11 AM
To: Cash, Tim; Champion, Becky; Caldwell, Nap; Cowie, Gail
Cc: Katherine Zitsch (kzitsch@atlantaregional.com); Kathy Nguyen; Steve McCullers; David M. Kubala (dkubala@earthlink.net); Thomas Heard
Subject: Drought Management Rule Strawman
Attachments: 20140819 Comments on Drought Management Rule Strawman.pdf

Please find attached comments from Cobb County-Marietta Water Authority on the Drought Management Rule Strawman. Thank you for the opportunity to review and comment on this important initiative.

The original is in the mail to Mr. Capp. Thank you.

Glenn

Glenn M. Page, P.E.
General Manager
Cobb County-Marietta Water Authority
1170 Atlanta Industrial Drive
Marietta, Georgia 30066
770-514-5300 (o)
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COBB COUNTY-MARIETTA WATER AUTHORITY
REGIONAL WATER RESOURCE MANAGEMENT

August 19, 2014

Mr. James A. Capp
Chief, Water Protection Branch
Georgia Environmental Protection Division
2 Martin Luther King, Jr. Drive, Suite 1152 East Tower
Atlanta, Georgia 30334

RE: Comments on Drought Management Rules Strawman

Dear Mr. Capp:

Cobb County-Marietta Water Authority (CCMWA) is appreciative of the opportunity to review and comment on the proposed Drought Management Rules as drafted.

We have reviewed the comments provided by Cobb County Water System in a letter to you dated August 7, 2014, and fully incorporate those into our comments. In addition, we are working with the Metropolitan North Georgia Water Planning District to provide comments coordinated with other water utilities that are District members.

As you are aware, CCMWA is a wholesale-only water provider, which regularly positions us uniquely in the application of state rules and regulations. We have a contractual relationship with all of our customers, typically for a period of 50 years. These contracts provide no jurisdiction for CCMWA to regulate water use of the end-users of our customers, so any drought management rules would need to be applied by EPD through the operating permits held by our wholesale customers. Further, CCMWA has no physical means to limit supply to one customer without creating an enormous and unnecessary public health and safety risk. Relative to proposed requirements for drought surcharges and specific to CCMWA, a change in rate structures would affect a contractual relationship, and would have to be negotiated and ratified by multiple local political entities. Consideration needs to be given to the application of the proposed rules to a water wholesaler.

CCMWA has only one end-user customer, Lockheed Martin Corporation (Lockheed), one of Cobb County's largest employers. Lockheed's water use is highly variable and is based on its workload under contracts with the Department of Defense and other international governmental customers. The Lockheed Plant resides on property of the U.S. Air Force, and there are Air Force facilities on site that depend on water provided through the Lockheed system. Lockheed's water use is not outdoors, and forced reductions could result in loss of jobs, a severe impact to the local economy, and potential impacts to national defense. Since CCMWA is dependent on water managed by the U.S. Army Corps of Engineers, there does not appear to be a

means of accommodating by variance this large singular industrial customer which has a demand that varies independent of drought conditions.

In addition to Cobb County's comments about the definition of recreational turf in 391-3-30-.02, CCMWA adds the comment that for EPD to define recreational turf in one part of the State differently than in another part of the State seems highly arbitrary (farm vs. non-farm use). We believe that the State should avoid this distinction.

CCMWA wishes to reiterate Cobb County's comments related to water use reductions required under Drought Response Levels 2 and 3. In 2013, CCMWA's annual demand was less than every year since 1994, although the population of our service area had grown by approximately 300,000 people during that time. This was a result of several factors, including: higher than normal rainfall; an economy that has not fully rebounded to pre-recession levels; and mandatory conservation measures such as plumbing codes that require high-efficiency fixtures (for new construction and replacement fixtures) and tiered water rates designed to reduce discretionary outdoor use.

We do not have enough water use data since demands changed significantly following the 2007-2008 drought to determine what the comparative effects are of the above-listed drivers (or any others) of lower demands. As a result, we have not been able to predict with any accuracy over the past six years what our demands will be. How could we then predict what kind of surcharge we need to drive an unpredictable demand a certain percentage lower? For this reason, we believe the proposed surcharge requirement, in addition to other reasons, would be an exercise in futility until demands stabilize long enough for the water providers to determine what our "new normal" baselines are. We would be glad to provide our demand data to demonstrate this point.

The prohibition in 391-3-30-.09(6) against variance requests from "permittees whose water supply is obtained in whole or in part from storage in or releases from any project owned and operated by the United States Army Corps of Engineers" needs further consideration. CCMWA sells Cherokee County Water and Sewerage Authority (CCWSA) a very small amount of water (less than 1% of their total water sold) to meet needs in an area of Cherokee County more efficiently provided by water from CCMWA. CCMWA's sources are dependent on Corps projects; CCWSA's source is not. This prohibition would unreasonably prevent CCWSA from utilizing the drought protection they paid for in constructing the Hollis Lathem Reservoir, likely resulting in a decision to disconnect from CCMWA and serve a portion of its customers less efficiently. Further, other CCMWA customers could be prevented from benefiting from the drought protection provided by the Hickory Log Creek Reservoir built on their behalf in the Coosa Basin if the Director declares a drought in the Chattahoochee Basin. This prohibition is particularly unreasonable in light of the fact that, even in a drought year, consumptive use by metropolitan Atlanta utilities makes less than a 3% difference in Florida state line flows in the Apalachicola River. A 15% reduction in water use by utilities targeted by this prohibition is insignificant to downstream purposes.

Finally, we believe that a drought management rule should require prudent actions to preserve a region's long-term water supply ***or*** measurable decreases in water demands leading to a demonstrated extension of available supplies. A rule that prescribes both required actions ***and*** mandatory outcomes takes away a utility's ability to manage its system prudently to meet its public health and safety—and economic—obligations, while responsibly preserving the resources for all affected users.

Thank you again for the opportunity to comment on the Strawman. We look forward to working with EPD to finalize and implement a drought management rule that is both reasonable and effective.

Respectfully,

Glenn M. Page, P.E.

cc: Nap Caldwell
Tim Cash
Becky Champion
Thomas Heard
Katherine Zitsch
Tim Cash

Cobb County Water System

COBB COUNTY WATER SYSTEM

Customer Services Facility
660 South Cobb Drive
Marietta, Georgia 30060-3105
770-423-1000
www.cobbwater.org

Stephen D. McCullers, P.E.
Director

Divisions
Business Services
Customer Services
Engineering & Records
Stormwater Management
System Maintenance
Water Protection

August 7, 2014

Mr. James Capp, Chief, Water Protection Branch
Georgia Environmental Protection Division
2 Martin Luther King Jr. Drive, Suite 1152 East
Atlanta, GA 30334

Re: Comments on Drought Strawman

Dear Mr. Capp:

Cobb County Water System is grateful to have an opportunity to review the Drought Strawman in advance of the rule making process. We appreciate Georgia Environmental Protection Division addressing such a key issue for our state.

Having been through several severe droughts, we understand the importance of a comprehensive approach in order to ensure that sufficient supply is available to meet public health and safety needs during a severe shortage. We have provided comprehensive comments about the strawman based upon our experience managing these events. We are happy to provide any clarification or discuss these comments in greater detail.

If you have any questions please feel free to contact us at 770-419-6338 or 770-419-6244.

Sincerely,

COBB COUNTY WATER SYSTEM

Stephen D. McCullers, P.E.
Director

Kathy Nguyen
Senior Project Manager

CC: Judy Jones
Tim Cash
Becky Champion
Nap Caldwell

Cobb County Water System Comments on Drought Strawman
August 7, 2014

391-3-30-.02 Definitions.

(4) "Farm uses" shall mean irrigation of any land used for general farming, forage, aquaculture, pasture, turf production, orchards, or tree and ornamental nurseries; provisions of water supply for farm animals, poultry farming, or any other activity conducted in the source of farming operation. Farm uses shall also include the processing or perishable agricultural products and the irrigation of recreational turf, except in the Chattahoochee River watershed upstream from the Peachtree Creek confluence, where irrigation of recreational turf shall not be considered a farm use.

Cobb County Water System (CCWS) opposes the inclusion of recreational turf as farm use. We understand this definition is partially lifted from state law passed in 1988 (HB1543), which also exempted withdrawals that average less than 100,000 gallons per day from permit requirements. The entire original definition actually also prohibits recreational turf from being considered farm use when the source of irrigation is groundwater from: Chatham, Effingham, Bryan and Glynn Counties. CCWS has three points about this proposed definition.

1) Recreational turf should not be called out as a farm use, rather it is more appropriate for it to be treated as golf courses are treated, and have in place Best Management Practices and some restrictions that tighten in severe drought. Recreational turf does not qualify under any of the overriding definitions of farm use. It has no role in farming. It is far more similar to golf courses, which are also recreational turf.

2) It would be very difficult for CCWS to explain and manage watering restrictions on recreational turf in Cobb County with the two proposed classifications. Approximately 25% of Cobb County is in the Chattahoochee River basin upstream of the Peachtree Creek confluence, 35% is downstream of the Peachtree Creek Confluence, and the remaining 40% is in the Coosa basin. The differing classifications of recreational turf would also impact the cities of Marietta and Smyrna in Cobb County.

3) The definition that is referenced is not quoted in its entirety to include the other prohibitions on classifying recreational turf as farm use from sources other than the Chattahoochee upstream of Peachtree Creek, which would indicate the definition can be altered for the purpose of this rule.

(5) "Permittee" is defines as:

(d) permittee does not include any person that holds a water withdrawal permit for farm uses.

CCWS opposes the elimination of agriculture from the drought rules. It is understood that the Flint River Drought Protection Act will address some agricultural use, but there is agricultural use in North Georgia and the Coastal Plains that is not being addressed. If the primary goal of the rule is to protect water systems to ensure supply, that cannot be done by exempting users of the shared resource. Stewardship of a shared resource is a shared responsibility and only a multi-user approach can provide a comprehensive and sustainable plan to address shortages.

391-3-30-.03 Pre-drought Mitigation Strategies.

(1) During non-drought periods, irrigation outdoors for purposes of planting, growing, managing, or maintaining ground cover, trees, shrubs, or other plants shall be in accordance with O.C.G.A. §12-5-7(a.1)(1) and (2).

The stewardship bill signed into law in 2010 failed to address other outdoor usage e.g. pressure washing, car washing, pool filling, washing hard surfaces, fountains, etc. By not including these uses they remained on the previously adopted odd/even schedule rather than the 7 day a week schedule with hourly restrictions for irrigation. This creates two sets of rules for outdoor usage. CCWS recommends that this rule address the uses overlooked in the stewardship act and have one non-drought schedule for all outdoor discretionary usage.

(2) The state has already made, and continues to make, extensive investments in water efficiency since conservation measures play such an important role in water stewardship. Therefore, with the exception of the outdoor irrigation requirements in O.C.G.A. §12-5-7(a.1)(1) and (2) and the Drought Contingency Plans and Water Conservation Plans required under Rules 391-3-2-.4(11), 391-3-6-.07(4)(b)8, and 391-3-6-.07(4)(b)9, which are referenced within this rule, this rule does not repeat or modify any existing predrought mitigation strategy or create any new pre-drought mitigation strategies.

CCWS agrees that much progress has been made on conservation, particularly in the coastal red zone and metropolitan Atlanta area. We also understand that a concurrent conservation rule making effort is underway, and we recommend these two processes not occur in isolation, but rather work in concert. The draft water use and efficiency reporting guidance could be referenced here and the baseline formula could be used to set a realistic baseline. This baseline could be used by utilities that are further down the efficiency path when setting base reductions, thereby lessening the anticipated impact of demand hardening. It is a fixed baseline that is reflective of wet and dry years and considers the strides made by parts of the state on conservation.

On a broader point the drought rule creation might benefit from the completion of the conservation rule. Water conservation and efficiency rules are about creating an efficient culture and the sustainable management of a resource. Drought rules address a short period of crisis. It may be easier to base next steps that would be needed to manage an emergency shortage after having established a clear set of basic efficiency practices. Additionally, the proposed tracking information might provide needed data for setting those emergency thresholds and action items.

391-3-30-.04 Drought Indicators and Triggers.

(1) The Director shall monitor climatic indicators and water supply conditions as needed to assess drought occurrence and severity, and its impact upon the ability of permittees to provide adequate supplies of water and avoid or relieve local water shortages. Such indicators and conditions may include but may not be limited to the following:

(a) Precipitation;

(b) Streamflow;

(c) Groundwater;

(d) Reservoir Levels;

(e) Soil Moisture; and

(f) Short term Climate Predictions.

(2) Prior to making a drought response declaration pursuant to Section 391-3-30-.05, the Director may consult with state and federal entities charged with collecting, interpreting and disseminating data used as a basis for developing drought indices. Such agencies may include but not be limited to the following:

(a) State Climatologist;

(b) National Oceanic and Atmospheric Administration;

(c) United States Geologic Survey; and

(d) United States Army Corps of Engineers

We understand the need for some flexibility in declaring drought, based upon conditions on the ground, but feel thresholds and triggers should be identified to anchor evaluation and analysis efforts. CCWS opposes the total lack of establishing clear, defined, and science based drought triggers and thresholds. This is inconsistent with all guidance on drought planning. This leaves stakeholders, both those charged with implementing the plan and those affected by the plan, with no ability to prepare for an anticipated declaration or to appeal a decision made by the Director. There will be no criteria upon which to base either the declaration or the appeal. This can result in delayed implementation that can unnecessarily escalate the severity of the shortage by failing to intercede in a timely manner to reduce the impact of the drought. According to The American Water Works Association Drought Preparedness and Response M60 Manual of Water Supply Practices "There will be enormous pressure to not declare a water shortage. It is important that triggers be clearly defined and documented as part of the adopted water shortage contingency plan. Imposing restrictions, significant water rate increases, or rationing often results in upset customers that foresee damage to their businesses, homes, and lifestyles. Political leaders need clearly defined triggers to make decisions when there is a water supply problem."

(5) Upon declaring a drought response level, the Director shall provide notice of such declaration to all permittees within the affected drought area(s).

The rule does not specify how permittees will be notified. This process should be clearly established prior to a drought. For example in the last declared drought (2007) permittees were notified when they received a press release. Permittees should receive a formal correspondence from GAEPD with a clear explanation of the adopted actions or reduction targets that correlate to the declared drought level.

391-3-30-.06 Drought Response Committee.

(1) A Drought Response Committee may be convened by the Director at any time for purposes of consulting on the development and/or implementation of pre-drought mitigation strategies or drought response strategies and may consist of such members and for such period of time as the Director deems appropriate.

CCWS objects to the wide discretion provided to the EPD Director in this version of the rule. Several comments were submitted to EPD in May 2014 about the need for response committees with broad stakeholder representation and comprising representatives of those stakeholders that are from the affected region. We recommend incorporating some direction about the composition of the drought committee into the rule.

391-3-30-.07 Record Keeping and Reporting.

CCWS supports enhanced reporting, but we feel the suggested reporting here is both redundant (no real difference from monthly consumption reports currently submitted) and unlikely to provide any information that would add to management of the resource. We suggest that EPD look at current reporting requirements, make any needed changes to those reports, and incorporate the draft water use and efficiency reporting guidance currently being tested by EPD and several utilities. This approach is likely to provide data that can be more readily utilized in determining how water systems are being managed and better estimate the current impact on the resource.

391-3-30-.08 Drought Response Strategies.

CCWS encourages EPD to review the current proposed drought levels. In the draft available for comment, there is no significant separation between non-drought, Level I, and Level II (only shortening the 7 day a week irrigation schedule from 18 available hours to irrigate to 8 hours in Level II). Such a fractional separation between levels will often cause over utilization of the most severe drought level, which incorporates far more draconian reductions and usage curtailments.

(2) Drought Response Level 1

(a) General Outdoor Watering. Outdoor irrigation for purposes of planting, growing, managing, or maintaining ground cover, trees, shrubs, or other plants, as described in O.C.G.A. §12-5-7(a.1)(1), may be conducted between the hours of 8:00 P.M. and 8:00 A.M.

(b) Specific Categories of Outdoor Water Use. The outdoor water uses listed in O.C.G.A. §12-5-7(a.1)(2) are not affected.

(c) Other Outdoor Water Use. The following outdoor water uses shall not be allowed by permittees, except as provided:

(i) Watering in of pesticides, herbicides and fertilizers, except between the hours of 4:00 p.m. and 10:00 a.m.;

(ii) Use of fire hydrants, except for the purposes of firefighting, public health, safety, or flushing.

d) Drought Surcharge Pricing is not triggered at this Drought Response Level.

(e) Numeric Water Usage Reduction Targets are not triggered at this Drought Response Level.

CCWS recommends also addressing other outdoor usage in the drought levels such as pools, pressure washing, washing hard surfaces, and car washing. Item (c)(i) adds confusion since other irrigation is permitted between 8PM-8AM, It's not clear why watering in of pesticides would have other hours; if professionals are putting down the chemicals they have a professional exemption and can water it in anytime. As with exemptions for professionals in the landscape industry we ask that professional exemptions be extended to other water dependent businesses such as pool companies, pressure washers, mobile detailers, and carwash facilities. Additionally, it has been our experience from managing past droughts that it is beneficial to specifically address charity carwashes; this was a challenging issue in past droughts.

(3) Drought Response Level 2. During Drought Response Level 2, permittees shall implement all Drought Response Level 1 measures plus the following additional Drought Response Level 2 measures:

CCWS recommends that Level II be completely revamped. We will comment on exemptions in a separate section. Level II should be an interim step as the conditions worsen; therefore, more stringent mandatory reductions in discretionary water use need to be considered. According to AWWA M60, Drought Preparedness and Response, "Twice weekly irrigation of lawns is generally adequate. Having all irrigation occur on weekdays, for instance, will make enforcement easier. If irrigation is limited to odd-even days of the week or every other day the water supplier may actually experience an increase in landscape water use." CCWS suggests using odd-even schedule to assign two watering days in this stage as well as tightening the hours to between 10PM-6AM.

We also recommend that other activities be limited as well such as: pressure washing, washing hard surfaces, pool fillings, etc. This entire level needs to be reevaluated. It should provide a suite of mandated restrictions or activities, and should be significantly more restrictive than Level I, but far less draconian than Level III. These suggestions are not exhaustive, but rather considerations for redrafting this level.

(b) Specific Categories of Outdoor Water Use. The outdoor water uses listed in O.C.G.A. §12-5-7(a.1)(2) shall be allowed by all permittees, subject to the following additional requirements:

CCWS agrees with EPD's interpretation that O.C.G.A. §12-5-7(a.1)(2) does not protect the exemptions by statute during times of drought. Paragraph (a.1) (2) refers only to paragraph (a.1)(1) not limiting the use. It does not specifically say they cannot be altered during times of shortage.

We do agree that some of these exemptions need to be addressed; however, we do not feel the draft addresses them in such a way to encourage efficient practices in times of drought and limit high usage that would make resource preservation challenging. Some of these uses should be restricted to time of day in early drought levels and should have limits on days of the week in the most severe level. More specific suggestions are referenced below.

O.C.G.A. §12-5-7

(a.1) (1) Persons may irrigate outdoors daily for purposes of planting, growing, managing, or maintaining ground cover, trees, shrubs, or other plants only between the hours of 4:00 P.M. and 10:00 A.M.

(2) Paragraph (1) of this subsection shall not create any limitation upon the following outdoor water uses:

...

(D) Use of reclaimed waste water by a designated user from a system permitted by the Environmental Protection Division of the department to provide reclaimed waste water;

...

(G) Drip irrigation or irrigation using soaker hoses;

...

(I) Use of water withdrawn from private water wells or surface water by an owner or operator of property if such well or surface water is on said property;

...

(K) Irrigation of athletic fields, golf courses, or public turf grass recreational areas;

Exemption (D) the reuse water exemption underlies a shortcoming with the draft rule. There is no consideration given to whether the water use being reduced is consumptive or returned to the source. To allow a blanket exemption on reuse water, fails to recognize the interconnectedness of water in both the natural and manmade cycle. If reuse water is being used for irrigation, that water is not being returned to the source and the percentage of consumptive water use for the system increases and available water for the drought affected source decreases. Reuse water is a viable option, but should have restrictions in higher drought levels. This usage should also be limited by time restrictions and days of the week in level 3.

Exemption (G) Drip irrigation– This exemption is actually altered in the highest drought levels to be time of day. CCWS disagrees with limiting this exemption because limiting this is actually a disincentive of a more efficient irrigation option.

Exemption (I) Use of water from well or surface water – CCWS renews the concern that the allowance of withdrawals of 100,000 gal/day makes managing the resource very difficult. It has a cumulative effect. This is particularly true in the Dougherty plain and coastal aquifer, the drought of 2010/2011 saw significant drops in the water table in these areas causing systems in this region challenges in meeting supply. This was exacerbated by the proliferation of private wells that were dropped further and further as water availability decreased. This exemption also makes it difficult for utilities to enforce watering restrictions, because they often do not have the resources to investigate every property that puts up a sign that well water is used for irrigation,

Exemption (K) Irrigation of athletic fields and recreational turf - This exemption has to be tightened as drought severity increases. It should have hour of the day limitations during early stages and should go to limited days (two days a week) during the highest level of drought. In Cobb County we have 44 park facilities on 1,350 acres. Their irrigation use for July 2014 was 5,322,000 gallons. The school system has 115 schools, 15 of which are high schools with multiple practice and play fields. The irrigation use for just the high schools in July 2014 was 1,387,000 gallons. Recreational turf is a significant amount of water in a time of severe drought. This classification should be more closely aligned with golf courses. If recreational turf and athletic fields are going to be set aside for special exemptions, they should have to implement a suite of Best Management Practices to minimize their water use and reduce waste and overwatering. This is consistent with the Georgia Golf Course Superintendents' actions.

Exemption (L) and (M) - CCWS recommends addressing exemptions of this classification including watering in of pesticides, previously mentioned, with a general professional exemption. This would exempt any similar activities as long it was being performed by a professional. If an individual property or business wanted to perform these activities it would fall within the same restrictions as any other activity including hourly or day of the week restrictions. This would be consistent with other discretionary uses and the desire to preserve business, but would not provide a special exemption for citizens based upon their chosen discretionary usage.

(d) Drought Surcharge Pricing. Within 1 year of the effective date of this Rule, permittees who are public water systems shall develop and implement a drought surcharge program as a price incentive for customers to reduce water demand. The surcharge program shall meet the following criteria:

(i) Drought surcharge rate(s) shall be distinct from established water rates;

(ii) Drought surcharge rate(s) shall apply only to the volumetric water rates;

(iii) Drought surcharge rate(s) shall be consistent with achieving a 5% water use reduction compared to the baseline for months October through March and a 10% water use reduction compared to the baseline for months April through September; and

(iv) Drought surcharge rate(s) shall be approximately revenue neutral relative to non-drought periods.

CCWS is opposed to the inclusion of a mandated drought surcharge. We recognize the potential benefit of a surcharge, particularly for providing enhanced revenue stability in the face of significant, temporary usage reductions. We feel it is a valid tool in the drought management toolbox, but should not be mandated.

1) Rate setting is very specific to each individual utility, and CCWS does not believe decisions involving the way our citizens are charged for a vital service should occur at the state level. This is an issue that should remain at the local government/utility level.

2) CCWS has real concerns about the political realities of implementing a surcharge on rate payers. This requirement seems particularly punitive to customers in metro Atlanta who are already subject to tiered water rates that discourage discretionary water use. Adding a surcharge is going to place an additional burden on these rate payers. Also to try and levy a surcharge equitably, it would have to be calculated individually on winter use. If it is just levied upon the tiered pricing, some customers with high non-discretionary use will be paying a higher price for water.

3) If it were to move forward, the one year timeline is unreasonable, not all billing systems have this capability. The cost and process of upgrading a billing system is significant. CCWS has a biennial budget process, which is a two year financial planning horizon just to get the project funded. Billing systems have a multi-million dollar capital cost and multi-year design and implementation timeline.

4) As presented in the draft, the drought surcharge is supposed to send an incentive that would encourage the percentage usage reductions being called for in each level, and remain relatively revenue neutral. Water is largely classified as inelastic. Typical elasticity ranges for water from various studies show it is calculated between .15 on the low end and .5 on the high end, with average estimated elasticity of .20. This means for every 10% increase in water rates you can expect a 2% reduction in demand; therefore, it can be estimated that a surcharge of 50% may be needed to achieve a 10% reduction. In Chapter 5 of O'Sullivan and Sheffrin's Economics: Principles and Tools, 2001, it states "along an inelastic range, an increase in price leads to an increase in total revenue." Because of this, it would be very difficult for the surcharge to achieve both stated purposes in the draft rule. According to AWWA M1 Principles of Water Rates, Fees, and Charges Sixth Edition, a drought surcharge implemented to generate a usage reduction will generate increased revenue. " Excess funds are generated from surcharges imposed solely to encourage conservation, above those needed to meet potentially increased costs, and should be set aside in a reserve fund to be used for future drought-related mitigation purposes such as development of additional sources for supply." This further supports the difficulty in utilizing a surcharge to decrease water use and remain revenue neutral, as well as the political challenges of applying a surcharge to water bills in the percentage needed to achieve a mandated reduction. Drought surcharges may be a very viable tool for a utility to ensure revenue stability when facing water use reductions brought on by water shortage contingency measures, but that decision should be left to the local utility.

(4) Drought Response Level 3. During Drought Response Level 3, permittees shall implement all Drought Response Level 1 and 2 measures plus the following additional Drought Response Level 3 measures:

(v) Permittees required to conduct a Water Loss Audit shall adjust the water use reduction targets of this Section based on the Water Loss Audit Data Validity Score and Target Infrastructure Leak Index as shown in Table I and Table II."

> The water audits should not be used in the drought rule as a metric for reducing threshold targets. This could encourage utilities to manipulate numbers to achieve targets to get the highest threshold reduction. The water loss auditing and any associated benchmarks need to be addressed in conservation and efficiency rule making. They are a long-term system efficiency effort, and including them in a short-term drought response plan is inappropriate

Applicability of Rule

The preponderance of comments collected by EPD in May 2014, in advance of the draft strawman, called for EPD to look at the out of date law that exempts all use of 100,000 gallons/day from permitting or reporting and possibly supporting legislation to address this issue. Many commenters stated concern about the cumulative impacts of this usage in a time of resource stress and their (*EPD or utility*) inability to address it due to the current law. In the draft strawman EPD does not address this issue and also removes all water providers who supply less than 1 MGD from the list of those who must implement the proposed drought rule. In Georgia there are 24,022 public water systems only 419 exceed 1MGD. This is 1.7% of water systems, though admittedly they represent a significantly larger portion of the population, it still leaves a significant number of users unaffected by drought rules. The draft strawman also addresses industrial permittees by indicating they should follow their drought plans, submitted as a part of their permit. Local utilities also have permit required drought plans, but if they provide more than 1MGD they are subject to the drought rule, and not their submitted plan. CCWS understands the need for consistent and coordinated drought response. In order to achieve that, other users of the resource should be required to adhere to the same rules.

Baseline

CCWS objects to the proposed floating baseline for establishing drought mandated reductions. Again, CCWS recommends that EPD work in concert with its conservation rule making and consider establishing a baseline utilizing the Water Use and Efficiency Reporting Baseline methodology. This is currently being tested by utilities, and the flexibility allows creation of a fixed baseline, which takes into consideration the advanced efficiency and conservation investments by some utilities as well as encompassing a period of wet and dry climate extremes.

CCWS believes a fixed and understood baseline derived from the referenced reporting coupled with mandated actions and restrictions, which escalate as the drought severity level escalates, is the best approach to protect public water supplies.

The preponderance of comments received in May 2014 regarding drafting a rule pointed out that utilizing a baseline that reflects current conditions is not an accurate representation, because usage has not rebounded from the drought and other climactic factors as well as the economic slowdown.

For example Cobb County Water System has seen a dramatic reduction in our AADD since 2005 and has seen it further influenced by significant climate influences.

2005 AADD – 62.47 MGD
2006 AADD – 66.39 MGD – Drought conditions
2007 AADD – 65.56 MGD – Drought Conditions followed drought level 4 declaration and additional rationing
2008 AADD – 53.68 – Drought restrictions in place
2009 AADD – 53.72 Restrictions lifted in June catastrophic flooding
2010 AADD – 57.01 – Drought conditions / economic slow down
2011 AADD – 56.47 – Drought conditions / economic slow down
2012 AADD – 56.56 - Drought Conditions economic slowdown
2013 AADD – 45.67 – Excessively wet year totally impacted by climate (This is a 20% reduction just based upon a climate influence. If this were the random year a baseline was calculated CCWS would have to eliminate all outdoor water use and still would likely not achieve it.)

The drop in AADD in 2013 is greater than the 18% drop achieved with the mandatory reduction and total ban on outdoor watering, illustrating that the impact of climate conditions on consumption patterns and the need to both account for them and normalize for them when creating reduction targets.

Cobb's system per capita calculations also reflects a similar usage fluctuation, with a more significant usage reduction caused by an excessively wet year than the drought restrictions.

2005 – 122 GPCD
2006 – 126 GPCD
2007 – 122 GPCD
2008 – 103 GPCD
2009 – 104 GPCD
2010 – 113 GPCD
2011 – 112 GPCD
2012 – 108 GPCD
2013 – 98 GPCD

When comparing usage targets with other regions of the country, it is important to account for the percentage of use that is utilized for discretionary usage (essentially outdoor use). For the purpose of the proposed drought rule, that would be the difference between the assigned reporting periods (Jan, Feb, Mar, Oct, Nov, Dec) and (Apr-Sept). CCWS reviewed consumption by billing category from 2005 to present and calculated averages for each user class for each designated reporting period. The total difference or peaking factor for CCWS for this period fluctuated between 1.03-1.41 with an average 1.21 peaking factor for the reporting period. This means in the last eight years Cobb's summer average, as defined by the proposed rule, has comprised between 3%-41% of the system's use. According to the Alliance for Water Efficiency in areas of the southwest outdoor water use comprises over 60% of the region's annual use and can be double during irrigation season. This comparison is essential to understand when setting threshold reductions. A 20% reduction in a community with a peaking factor of 2 is a more achievable goal than a 20% reduction with a peaking factor 1.2. The system with the higher peak will be able to make less severe curtailments to discretionary water use to achieve their target. The system with the smaller peak will not only have to make severe curtailments of discretionary water use, but also potentially have to ration water typically classified as essential, including

some production curtailments in areas that are largely industrial. This was the case in Dalton, GA when the state mandated a 10% reduction from the previous winter average.

The establishment of the floating baseline and threshold reductions; may in fact inadvertently encourage inefficiency in water systems. According to Considerations for Drought Planning in a Changing World January 2014, authored by the Alliance for Water Efficiency and the San Antonio Water System, "There has been concern about the potential for diminishing effectiveness of short-term curtailment strategies due to the implementation of permanent restrictions and the success of long-term water efficiency efforts." This is demand hardening. Demand hardening is the diminished ability or desire of affected customers to reduce water use because of the adherence to long-term efficiency and conservation initiatives. Mandated reduction targets are more challenging to achieve where sustained conservation and efficiency have been obtained; however, the resources in areas with sustained conservation are more resilient to drought, so they are less likely to require as stringent a reduction as an area that has not implemented long-term efficiency efforts. This can be seen in Georgia when comparing 2007/2008 to 2010/2011. The climate indicators for these drought periods were very similar, but the systems in Georgia had seen the effect of conservation initiatives and drought contingency supply augmentation and the water resources were sustained during the period, without severe curtailments. If mandatory reductions are called for based upon the usage of the period preceding drought, there is little emphasis to encourage long-term efficient use of the resource. In fact, it could be argued that those systems who have invested in efficiency are punished by a floating baseline. A fixed baseline that accounts for those systems who have invested in conservation and efficiency coupled with a suite of selected curtailments is a preferable approach that allows the state to continue with its conservation efforts, which have been listed in the State Water Plan as a priority practice.

Threshold Reduction Process

CCWS finds this process of calculating reduced thresholds for Level III's mandated reduction target to be complicated and cumbersome. It appears to be a second methodology for a variance. It is also not available to any utility utilizing a federal project or a source dependent upon releases from a federal project. CCWS would be unable to participate in this target reduction program, despite our wholesaler's investment in Hickory Log Creek Reservoir, a project that provided an additional water supply. CCWS advises looking at this methodology and the variance process and streamlining this into one process. The need for this complicated process might be eliminated if a fixed baseline was used that took into consideration efficiency investments and climate factors as previously recommended in these comments.

Columbia County

COLUMBIA COUNTY
GEORGIA
Water Utility

August 14, 2014

Mr. James A. Capp
Chief, Watershed Protection Branch
Georgia Department of Natural Resources
Environmental Protection Division
2 Martin Luther King Drive
Suite 1152 East
Atlanta, Georgia 30334

RE: Proposed Amendments to the Rules of the Department of Natural Resources (DNR) Environmental Protection Division (EPD) Relating to Drought Management, Chapter 391-3-30

Mr. Capp:

The Columbia County Water Utility appreciates the opportunity to comment on the proposed amendments to Georgia's Rules for Drought Management, 391-3-30. We support the EPD's efforts to take a proactive stance in regards to pre-drought mitigation and drought response strategies. Although we support most of the concepts in these proposed amendments, there are a couple we believe should be reconsidered. We agree that water systems should strive to reduce consumption during periods of drought, but we disagree with the idea of being told how to achieve the reductions. In the May stakeholder meeting concerning the drought rules, when discussing lessons learned during the 2006-2009 drought, the EPD stated: "Water systems need discretion in how they achieve water use reductions." We believe that still holds true and would encourage the EPD to allow us that discretion. The following paragraphs contain our responses to specific sections of the rule and some suggestions.

391-1-3-.06 delineates formation of a Drought Response Committee. Columbia County supports the concept of a Drought Response Committee.

In 391-3-30-.08 (2) (ii) and other places, use of fire hydrants is prohibited except for the purposes of firefighting, public health, safety, or flushing. Somewhere in this rule it should be stated that safety reasons and public health reasons are to be determined by the jurisdiction with responsibility for the hydrants.

391-3-30-.08 (3) (d) mandates Drought Surcharge Pricing. Rather than mandating a specific drought response measure, Columbia County recommends considering a couple of alternative strategies to accomplish the desired water use reductions: a drought response toolbox approach or a temporary permit reduction.

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www.columbiacountyga.gov

In the drought response toolbox approach, instead of mandating drought surcharges, have a toolbox of drought response Best Management Practices and require each permittee to select one and track the reduction. If the initial selected response does not yield satisfactory results in a set amount of time, require selection of an alternate or addition of a second response. Example of drought response best management practices might include:

- Increasing block rate structure (AWWA M60 pg 26)
- Drought surcharge rate structure (AWWA M60 pg 26)
- Enactment of water conservation ordinances
    - Requirement for bypassing automatic sprinkler times in the event of rain
    - Waste of Water prohibition ordinance (AWWA M60 pg 23)
    - Implementation of a public education program
- Enforcement program for drought response violations that includes financial penalties
- Installation of flow restriction devices for non-cooperative customers (AWWA M60 pg 34)
- Rebate program for installation of low flow fixtures and/or appliances
- Credits of installation of gray water systems
- Commercial and/or industrial water audit requirements with incentives for use reduction

Another thought to consider in regards to drought surcharges is the length of time it takes for financial impacts to yield a reduction in water use. Columbia County implemented an increasing block rate water structure many years ago. Initially there were two water use tiers. It took almost 18 months to see a significant reduction in water use. A few years later, we added two additional tiers with rates considerably higher for large water users. It took more than a year for this change to impact water consumption. Based on our experience, a drought surcharge may not be the most efficient way to curtail water use.

A second alternative is for the EPD to temporarily reduce a systems water withdrawal permit limitation during a declared drought. This approach would also put the decision of what to do to achieve compliance in the hands of each utility. The amount of the permit reduction could still be tied to water audit results and/or additional conservation measures already in place at a utility. For example, during a Stage 2 Drought, all water withdrawal permits are reduced by 10%. If a utility's water audit results fall into the table already developed, its water withdrawal permit reduction may only be 9%; if the utility also has an increasing block rate structure, its permit is reduced by 8%, etc.

One issue with drought surcharges in particular is the complexity of many billing systems and the cost of reprogramming the system to handle a surcharge in the rate structure. Some billing systems may accommodate this change relatively easily where others do not. Paying the billing software company for this change may be relatively expensive, negating the income derived from the surcharge.

391-3-30-.08 (4) (e) (i-iv) address Numeric Water Usage Reduction allows permittees whose water source is not being severely impacted by the drought to reduce the required water use reduction targets. Columbia County agrees with this strategy. We also support the credit given in 391-3-30-.08 (4) (e) (v) for a system's Water Loss Audit Data Validity Score and Infrastructure Leak Index.

In summary, Columbia County agrees with the idea of a Drought Response Committee, believes language should be added allowing water systems to define safety and public health reasons exempted from the rule, and strongly encourages the EPD to require water use reductions but allow water systems discretion in determining how to achieve those reductions.

Thank you again for this opportunity to comment on the proposed changes. The EPD has done an admirable job of involving affected stakeholders. We look forward to continuing to work together on water issues concerning Georgia.

Sincerely,

William Clayton
Director

Columbus Water Works

Columbus
Water
Works

Serving our Community
Protecting the Environment

August 12, 2014

Mr. James A. Capp
Chief, Watershed Protection Branch, EPD
2 Martin Luther King Jr. Drive, Suite 1152 East
Atlanta, GA 30334

Re: Drought Management Rule – Stakeholder Meeting #2

Dear Mr. Capp,

Columbus Water Works appreciates the opportunity to provide comments on the EPD's proposed Drought Management Rule revision. We appreciate you and the EPD staff for the open and informative public meetings that have encouraged constructive comments from public utilities and other interested stakeholders.

In particular, CWW applauds the EPD for attempts to address drought impacts in areas of higher or lower drought vulnerability through the Variances consideration. There are numerous locations in Georgia with ample water supply even during droughts and, conversely, there are areas in Georgia where minor droughts can present supply challenges. Thanks for recognizing that one size does not fit all.

The following are Columbus Water Works' general and specific comments relative to the July 3, 2014 "Stakeholder Draft Only – Not an Official Draft" of the proposed amendments to the Rules for Drought Management:

391-3-30-.04(2) Drought Indicators and Trigger
Suggest adding "(e) Drought Response Committee" to the list of potential contacts for the Director in making a drought declaration. Also suggest that the EPD consider the National Integrated Drought Information System (NIDIS) as a potential resource for drought indications.

391-3-30-.05(5) Drought Declaration
CWW suggests that the Director's drought declaration to all permittees be written in the form of a press release for the purpose of expediting public notification through the permittees.

391-3-30.06 Drought Response Committee
The makeup and representation on the Drought Response Committee should correlate directly with the affected drought area as identified in 391-3-30-.05. This is not clearly defined in the proposed rulemaking. Suggest adding Chair or Assistant Chair from each Regional Water Planning Council, along with Metro North Georgia Water Planning District representative to this committee.

391-3-30.07 Record Keeping and Reporting
Meeting the requirement to report within 14 days of the following month and/or 5 calendar days of the following month during drought conditions will be difficult for utilities that do not read meters on a calendar month and/or read either bi-monthly or quarterly. There are no provisions that address a utility's "read cycle" and/or reading methodology. This will require utilities to transition to monthly meter reading and could potentially increase cost due to additional meter reading requirements: (AMR/AMI technology, meter reading labor and capital requirements).

However, use of production meters for treated water delivered to mains from treatment facilities can be reported within the specified time frame, understanding that billed water use data will lag considerably. CWW recommends that the treatment facility production meters be utilized for EPD reporting as they will yield the most timely water use response to drought level declarations.

CWW also recommends that the EPD give consideration to water return rates, such that net consumptive use is the primary drought mitigation concern, not water withdrawal. The Drought Reporting Form:Worksheet1 would need to be modified to add "water returns through NPDES discharge permits" and "consumptive use". Any inflow and infiltration adjustments to NPDES discharge reports should not be necessary during droughts, since I&I impacts will be minimal. Therefore, since NPDES discharge permit reports are currently required, adding this to the worksheet should not impose a significant burden and will more precisely focus the drought water use reduction on consumptive uses.

391-3-30.08 Drought Response Strategies
CWW recommends consistency in drought level changes to avoid confusion. For example, outdoor water usage reductions should be for 2 hours on beginning and ending times. Such as:

Non-drought:	4 pm to 10 am
Drought level 1:	6 pm to 8 am
Drought level 2:	8 pm to 6 am
Drought level 3:	none allowed

To minimize the impact of drought responses to industries served through municipal permittees, in an effort to avoid significant economic impact to communities, municipal permittees shall be allowed to direct drought responses to only outdoor water use to avoid reductions in industrial productivity.

391-3-3-30.08(2)(c)(ii)
Recommend modifying text to: "Unmetered use of fire hydrants, except for the purpose of firefighting, public health, safety, or flushing." This will allow for temporary use of metered hydrant connections for the purpose of accommodating temporary water use during construction.

391-3-30-.08(3)(d)(iii)
Due to water conservation improvements as a result of the Water Stewardship Act, water usage reduction targets during cool months (i.e. indoor water use) may be difficult to obtain, therefore, lowering these reduction targets may be appropriate.

Also, October may be a higher water withdrawal and consumptive use month than April, especially relative to river flows. Consideration could be given to redefining the cool months as November thru April and this may also benefit the outdoor landscaping business.

391-3-1-30.08(3)(d)(iv) Drought Surcharge Rates Be Approximately Revenue Neutral to Non-Drought Periods
The utility should have the option to determine the recovery rate based on the drought surcharge as long as the drought reductions are achieved (i.e. utility may make the decision to offset lost revenue with reserves and not burden the entire revenue reduction to the customer base.)

Actual surcharge amounts and rate setting should remain a local issue determined by the permittee's rate setting authorities. Therefore, the referenced goal of "revenue neutral" should be deleted.

391-3-30-.08(4)(c)(i)
Suggest allowing pressure washing of buildings by painting contractors provided they use high efficiency, low flow nozzles (i.e. ≥ 1.5 gpm). This will avoid an unreasonable hardship to an important sector of Georgia's economy.

391-3-30-.08(4)(e)
Utilizing a single year as a baseline for reduction performance will introduce significant variability into reduction objectives and make meaningful reductions difficult to achieve. Recommend using an average of 5 immediate prior non-drought years to establish baseline.

391-30-.08(4)(e)(ii and v)
Suggest adding the following phrase at the end of Section (i), (ii) and (v)... "provided permittees demonstrate a water return rate to the source of 70% or greater based on average of three preceding non-drought years, considering September and October months only." These months are less apt to be impacted by I&I or outdoor water use, giving a better indicator of actual return rates.

391-30-.08(4)(e)(iii) It seems that the "0.75" and "1.25" are overly restrictive.
Suggest a clarification to change "demonstrating that withdrawals as a percent of stream flow are 0.75% or less..." to "demonstrating that withdrawals or consumptive use as a

percent of stream flow (on an annual average basis utilizing most recent pre-drought period.) are 3.0%.

391-3-30-.08(4)(e)(iv)
Suggest same changes as referenced in Section 391-3-30-.08(4)(e)(iii) above.

391-3-30-.08(4)(e)(iii) and (iv)...**demonstrating that withdrawals as a percent of stream flow are 0.75% or less may reduce the water use reduction target described in this section by 2.5% (or greater than 0.75% but less than 1.25% may reduce the water use target described in this section by 1.0%).** The tool currently uses 2007-2008 as the baseline. The rulemaking should specifically outline the baseline that will be used for these calculations (i.e. previous 12 months, previous declared drought year by region, etc.).

391-3-30-.09(4)
Recommend that permittees be allowed to perform drought vulnerability assessments and submit variance request to EPD prior to droughts to facilitate drought response and communication planning at the individual permittee level. Suggest 30-day EPD variance response during non-drought periods.

391-3-30-.09(6) Variance Requests – **Permittee whose water supply is obtained in whole or part from storage in or releases from any project owned and operated by the United States Army Corps of Engineers may not request a variance for restrictions that are less stringent than those described in this Rule.** Need to clarify what is defined as "storage in or releases from" Army Corps of Engineers.

Recommend clarification state: "Permittees whose water supply is withdrawn directly, in whole or in part, from storage in U.S. Army Corps of Engineers reservoirs or releases made specifically for individual permittees per agreement with USACE may not request a variance for restrictions that are less stringent than those described in this rule."

Thank you for the opportunity to comment. CWW looks forward to ongoing participation in the development of revisions to this rule.

Sincerely,

Steve Davis
President
Columbus Water Works

Don North

Cash, Tim

From: Don North <dnorth@esginc.net>
Sent: Thursday, July 17, 2014 2:56 PM
To: Cash, Tim
Subject: Drought Management Rule Stakeholder meeting #2

Mr. Cash
I hope you are feeling better.
Two comments:
If a wholesaler sells 100% of their water to other permitted system, how do they reduce 5%-15% of production if it all washes out?

Should the percent reduction be calculate on the consumptive losses instead of production? If a permitted system has 40% or greater consumptive loss then use a reduction of their withdrawal/groundwater use numbers. If a system has less than 40% consumptive loss, then reduce the consumptive use by 5%-15%.

Great meeting. Very informative

Thanks
don

Gainesville

Cash, Tim

From: Horace Gee <hgee@gainesville.org>
Sent: Tuesday, July 29, 2014 2:41 PM
To: Cash, Tim
Subject: Drought Management Rule - Stakeholder Meeting #2
Attachments: Comments on July 15 Meeting.doc

Sensitivity: Private

Tim,

Here's Gainesville's comments, have a great day.

Thanks,
CITY OF GAINESVILLE
ENVIRONMENTAL SERVICES
Horace Gee Jr.
Environmental Services Administrator

CITY OF GAINESVILLE

PUBLIC UTILITIES DEPARTMENT

757 Queen City Parkway, S.W.
Gainesville, Georgia 30501
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GA EPD Drought Management Stakeholder Meeting #2 Comments

City of Gainesville's comments on Georgia's Drought Management Rules

1. Water usage reductions proposed in all three drought levels during the months of October – March. For permit holders which reside within the MNGWPD this would be virtually impossible, the playing field would not be level. We've been subject to inclining rate structures for a number of years and we've seen a dramatic reduction of water use as a result over the past 6 years. The rest of the state hasn't been subject to the regulations the 15 county metro districts have been required to meet for years. As a result of our oversight from EPD and MNGWPD we've already reduced our water use to levels we never thought could be obtained. As a result of our relentless public education efforts our WINTER usage is at the lowest achievable limits all ready. Trying to meet 2.5% reductions in Drought Level 1, 5% reductions in Level 2 and 10% reductions during level 3 declarations would be impossible. The rest of the state may be able to meet these targeted reductions but those of us who have been targeting conservation for years would be a huge disadvantage. The proposed reductions for the months of April – September would also be very difficult to meet for the above mentioned reasons as well, but we could come closer to meeting them.

We (15 County Metro District) feel we're several steps ahead of the rest of the state when it comes to preserving our most precious resource "potable water" for future generations.

2. Surcharge: The MNGWPD already requires that we have a three tiered rate structure to discourage frivolous use of potable water. We are required to set our rates at the following levels Base Rate, Tier 2=125% of base rate and Tier 3=200% of base rate and all irrigation meters pay the Tier 3 rate for every gallon of usage. Imposing a surcharge rate on top of our Tiered rate structure would cause possible detrimental harm to some of our largest employers on our system. We a large commercial/industrial base and they represent a large percentage of the revenue we depend on. Let's say, using a number that was thrown around during the July Stakeholders meeting of 20% that would mean $40,000.00 increase in the "WATER" bill(s) for three of our largest customers per month.....that just may be the straw that broke the camel's back.....they pack up shop. Then all our remaining customers residential, commercial and industrial would be hit with a very large rate increase due to the fact we still have to provide the same level of service and pay the mortgage. This rate wouldn't go away when drought conditions improve because we still have to operate our business.

We applaud EPD for saying during the Stakeholders meeting tell your customers EPD required this surcharge mandate.....but EPD will not be responsible for the lost customers several utilities would experience from this mandate.....we would.....then what?

CITY OF GAINESVILLE

PUBLIC UTILITIES DEPARTMENT

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3. Water Loss Audit Data Validity Score and Target Infrastructure Leak Index: When EPD initiated this reporting they said it was for tracking reasons only, not to be compared across utilities. I personally have been amazed at some of the information I've seen from systems reports when it's only for reporting purposes. Now EPD is purposing using the data for drought management……..This will only cause more fudging of the data, which has seemed to me to already be reported just to make a system look good on paper……bad idea.

Most utilities within the MNGWPD have yet to recover from the conservation measures we implemented in 2008; we've worked hard at public education to conserve our resources. If the rest of the state just implemented the strategies we're doing within the district, the results would be sufficient to preserve our water resources regardless of climactic conditions. MNGWPD strategies have worked, look at the numbers, most everyone has reduced their water usage……..some are pumping to system less than they were in 2000.

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August 15, 2014

Mr. James Capp, Chief, Water Protection Branch
Georgia Environmental Protection Division
2 Martin Luther King Jr. Drive, Suite 1152 East
Atlanta, GA 30334

Re: Comments on Drought Strawman

Dear Mr. Capp:

The City of Gainesville Public Utilities Department sincerely appreciates the opportunity to provide input and feedback concerning the Drought Strawman in advance of the rule making process. We appreciate the Georgia Environmental Protection Division addressing such a key issue for our State.

There are six main issues that need specific comment, and I will discuss them in the order they appear in the Drought Strawman.

First, in all Drought Response Levels, the use of fire hydrants is prohibited "except for firefighting, public health, safety or flushing." I do not believe it is the State's intention to put hydro seeders, construction crews, and paving contractors out of business, but that may nevertheless be the end result. This issue may be resolved by simply stating "un-metered use of fire hydrants" is so prohibited.

Second, the exemption of water use for "farm uses" is both reasonable and understandable; however, it doesn't appear to go far enough. The exemption allows water use for "... general farming... provisions of water supply for farm animals, poultry farming, or any other activity conducted in the source of farming operations." However, in communities such as Cornelia and Gainesville, a substantial amount of water is required in the poultry processing industry; in essence, the State seems to imply its acceptable to exempt water use in order to grow agricultural products to feed poultry, and to actually raise poultry itself, yet the amount of water used to process the end result is included in the mandatory reduction targets during droughts. Since about a third of Gainesville's potable water is used by the top three poultry processing plants in Hall County, reducing water consumption by the target amounts during any drought response level without exempting these processing industries is impossible.

Third is the matter of Drought Surcharge Pricing, ostensibly to provide "a price incentive for customers to reduce water demand." While that may be effective in parts of the State where such price incentives are not already in place, some sort of credit should be provided to those systems that already have "conservation pricing." Otherwise, water systems such as Gainesville (and their water customers) are doubly

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penalized for water use compared to other systems, creating a severely inequitable situation.

Fourth, the reporting requirement seems cumbersome and redundant. During non-drought periods, a "Water Use Reporting Form" is to be submitted fourteen calendar days after the month being reported, and only five days during drought response levels. Currently, the Monthly Operating Report (MOR) is due on the 15th of the month following the month being reported. Why not 1) include the required information on the MOR (if other data is indeed required), or 2) move the reporting date of the MOR to earlier in the month? Otherwise more time is spent completing reports than is warranted.

Fifth, those systems over one MGD may alter their Percent Adjustment to Water Use Reduction Target based on the table value obtained using the Target Infrastructure Leak Index and the Data Validity Score, both of which are obtained in the Water Loss Audit. Experience has shown this document to be extremely subjective, meaning a system could alter these values in a way to reduce the water use reduction target. This is 1) not an original purpose of the Water Loss Audit, and 2) may lead to the corruption of the process, defeating the actual original purpose.

Lastly, the provision that "[p]ermittees whose water supply is obtained … from any project owned and operated by the United States Army Corps of Engineers…may not request a variance for restrictions that are less stringent" is problematic. The City of Gainesville has expended significant resources ensuring our continued ability to withdraw water from Lake Lanier (i.e., the levels of our raw water intake structures) and to be categorically prohibited from even applying for a variance fails to treat all systems equally.

Again, thank you for the opportunity to provide input in this process. If you have any questions or need any additional information, please feel free to contact me at any time.

Sincerely,

Donald E. Dye

Donald E. Dye
Assistant Public Utilities Director
City of Gainesville

cc: Kip Padgett, City Manager
Mayor Danny Dunagan
City Council Members
Kelly Randall, Public Utilities Director
file

Georgia Agribusiness Council

Cash, Tim

From: Bryan Tolar <btolar@ga-agribusiness.org>
Sent: Tuesday, August 19, 2014 12:00 PM
To: Cash, Tim
Cc: Pennington, Russ; Turner, Jud; mpisciotta@ga-agribusiness.org
Subject: Drought comments
Attachments: GAC comments on the draft drought management plan - 8192014.pdf

Tim –
Hope all is well. Attached please find our comments regarding the information provided at the second drought planning stakeholder meeting. Please feel free to contact us if we can be of assistance.
Thank you,
Bryan

Bryan Tolar, President
GEORGIA AGRIBUSINESS COUNCIL
Leading Georgia's Strongest Industry since 1966

GEORGIA AGRIBUSINESS COUNCIL

COUNCIL MISSION: "To advance the business of agriculture through economic development, environmental stewardship and education to improve the quality of life for all Georgians."

August 19, 2014

James A. Capp, Chief, Watershed Protection Branch, EPD
2 Martin Luther King Jr. Drive, Suite 1152 East
Atlanta, GA 30334

RE: Drought Management Rule – Stakeholder Meeting #2

Mr. Capp:

The Georgia Agribusiness Council would like to take this opportunity to submit comments regarding the draft State Drought Management Rule contemplated by the Georgia EPD Watershed Protection Branch.

We recognize and promote efforts to enhance environmental stewardship, and water conservation is certainly an essential component of stewardship. We would like to offer the following comments for your consideration as the rulemaking process takes shape.

First, the Water Stewardship Act (WSA) of 2010 contemplated numerous water conservation programs, initiatives and guidelines. Some of these were geared toward planning for increased conservation and water loss reductions every day while others are geared toward clearly stating water use allowances to help protect jobs and economic viability of various industry sectors. As mentioned in our May 30, 2014 letter, drought planning overreaches on several fronts in 2006 – 2009 hit Georgia's agriculture and landscape industries extremely hard. These sectors suffered more than $2 billion in economic losses and 35,000 jobs were eliminated according to a study conducted by the University of Georgia. Approaches must be more encompassing and holistic than outdoor water use reductions and the WSA responded accordingly by stating a series of outdoor water use exemptions. It states the following outdoor water uses shall not have any limitation:

1. Commercial agricultural operations as defined in Code Section 1-3-3;
2. Capture and reuse of cooling system condensate or storm water in compliance with applicable local ordinances and state guidelines;
3. Reuse of gray water in compliance with Code Section 31-3-5.2 and applicable local board of health regulations adopted pursuant thereto;
4. Use of reclaimed waste water by a designated user from a system permitted by the Environmental Protection Division of the department to provide reclaimed waste water;
5. Irrigation of personal food gardens;

6. Irrigation of new and replanted plant, seed, or turf in landscapes, golf courses, or sports turf fields during installation and for a period of 30 days immediately following the date of installation;
7. Drip irrigation or irrigation using soaker hoses;
8. Handwatering with a hose with automatic cutoff or handheld container;
9. Use of water withdrawn from private water wells or surface water by an owner or operator of property if such well or surface water is on said property;
10. Irrigation of horticultural crops held for sale, resale, or installation;
11. Irrigation of athletic fields, golf courses, or public turf grass recreational areas;
12. Installation, maintenance, or calibration of irrigation systems; or
13. Hydroseeding.

Such language is important because it helps clearly highlight industries excluded from outdoor water use restrictions, such as farm use, as well as encouraging the use of water recapture, reuse and high efficient systems. However, it goes further by stating that new installations, hydroseeding, and handwatering are also exempt because of the need to protect plant life, landscape installations and the environment.

Second, in reference to various drought levels, we suggest the following regarding outdoor water use:

Drought Response Level 1

General Outdoor Watering. Highlight the current outdoor irrigation allowance between the hours of 4:00 P.M. and 10:00 A.M. for purposes of planting, growing, managing, or maintaining ground cover, trees, shrubs, or other plants, as described in O.C.G.A. §12-5-7(a.1). State the 13 exemptions listed in the law as well.

Drought Response Level 2

General Outdoor Watering. Outdoor irrigation for purposes of planting, growing, managing, or maintaining ground cover, trees, shrubs, or other plants, as described in O.C.G.A. §12-5-7(a.1) may be conducted between the hours of 8:00 p.m. and 8:00 a.m. State the 13 exemptions listed in the law as well.

Drought Response Level 3

General Outdoor Watering. Outdoor irrigation for purposes of planting, growing, managing, or maintaining ground cover, trees, shrubs, or other plants, as described in O.C.G.A. §12-5-7(a.1) is not permitted. State the 13 exemptions listed in the law.

Drought Response Level 3+

General Outdoor Watering. Outdoor irrigation for purposes of planting, growing, managing, or maintaining ground cover, trees, shrubs, or other plants, as described in O.C.G.A. §12-5-7(a.1) is not permitted and such unauthorized uses shall be subject to a $250 fine per occurrence. State the 13 exemptions listed in the law.

Third, an additional allowance should be made for the watering in of pesticides and fertilizers. According to tufgrass specialists at the University of Georgia, some insecticides and fungicides need to be watered in immediately after application in order to move the product into the soil for effectiveness. We request language reflect these needs by allowing the watering in of these products immediately following application or between the hours of 4:00 p.m. and 10:00 a.m.

Fourth, we believe the implementation of water use reduction targets and a drought level pricing structure will aid in consumer responsiveness without unfairly targeting one type of water use over another.

Finally, we again stress EPD must establish measurable criteria for purveyors requesting to be more restrictive as well as a list of set objectives for such steps. These should include an analysis of reservoirs, stream flows and groundwater, as well as information on system water loss, balanced approach to prescribed water use reductions and stated goal of compliance (i.e. reduce water use by 10%, 20% etc.). The document "Guidance for Drought Response Modification Petition Process" dated May 27, 2008, is a

good reference tool, however it targets only outdoor water use reductions as methods to meet water conservation objectives. Such a tiered conservation structure could be beneficial.

Thank you for your consideration of our comments and please feel free to contact me if we can be of assistance.

Sincerely,

Bryan R. Tolar
President

Georgia Green Industry Association

Cash, Tim

From: chris@ggia.org
Sent: Tuesday, August 19, 2014 3:26 PM
To: Cash, Tim
Cc: jac.capp@dnr.state.ga.us
Subject: GGIA Comments on Drought Rules
Attachments: GGIA Comments for EPD Rules for Drought Management.pdf

Gentlemen,

Please find GGIA's comments regarding the drought rules attached. Please do not hesitate to call me with any questions or comments. We remain committed to working on this issue together so that we end up with the best policy we can. Thanks in advance for your consideration.

Chris Butts
Director of Legislative, Environmental and Public Affairs
Direct 706-540-2813
Email: Chris@ggia.org

The members of the Georgia Green Industry Association appreciates the opportunity to once again provide input on the proposed rules for drought management. Our membership includes all sectors of the Georgia horticultural industry from growers to landscapers and retailers, all of which can be greatly impacted by drought conditions but even more so from the drought rules which if not carefully crafted, can inadvertently send a message to consumers that they should not be buying our products and services. However, a carefully crafted drought plan, based on science and experience, can meet the objective of reducing water use while enabling the industry to contribute to both the economic and environmental health of our state.

Following a seeming continuous drought that encompassed most of the first decade of this century the green industry collectively looked for ways that would enable us to become better and more efficient users of water. This is true in both our production nurseries and in the landscape as well. Overall, water use has declined during this period and while there are many factors that led to this reduction, improved techniques and irrigation tools along with a more educated public have been principal influencers. We have also worked with our municipal and state level officials to insure that water policy was based on sound science and that it would encourage conservation and efficiency.

The Water Stewardship Act included exemptions for irrigation uses that are conservation minded. The exemptions also allow the industry to continue to operate without duplicating the catastrophic actions of the past which had an enormous impact on the industry. It was estimated that during the drought of 2007-2009 the industry lost as many as 35,000 jobs and as much as $2 billion in economic impact according to a study by UGA. Having a patchwork system of rules and complete outdoor water bans created a system of demand destruction.

These exemptions (listed at the close of these comments) developed after careful consideration, allow efficient forms of irrigation like drip irrigation and hand watering further into the drought cycle. Collectively, they account for a very small portion of water use while sending a powerful message to our citizens that these methods are not only environmentally effective but that new plants and landscapes can be purchased and installed even while reducing overall water usage. These exemptions were intended to be permanent and the language included in the Water Stewardship Act states that these exemptions shall not be limited. The act also lays out steps for the state to become better stewards of water in general. The burden for reducing water usage cannot fall entirely on the back of one industry, nor should the focus be entirely on outdoor water use. Instead, conservation and efficiency should instead be an ongoing mission for all of Georgia's citizens and business community.

GGIA
GEORGIA GREEN INDUSTRY ASSOCIATION

GGIA remains committed to working with all stakeholders to create better water use policy. Going forward, we recommend that the drought committee outlined in your proposal should include representatives from Georgia's agriculture and green industries. Not only do these sectors represent our state's largest economic engine, you will find that they are also committed to preserving Georgia's resources and our environment.

Likewise, our policy must reflect the fact that there is a direct correlation between outdoor water rules and the ability of our membership to earn a living. Restricting hours for things like watering in pesticides or drip irrigation can be impractical for contractors and may lead directly to lost jobs and opportunities. Drip irrigation uses very small amounts of water with emitters using as little as 1 gallon per hour. However, limiting drip to certain hours of the day may mean that a large landscape system can't complete its drip irrigation cycle. A specialized turf maintenance company may need to water in treatments throughout the work day and cannot effectively do so if limited to a short period in the evening. We must be careful that the unintended consequences don't prohibit contractors from doing what's right from a horticultural best practice. Nor should the rules negatively impact the business of the industry in return for minimal gains in water saving.

Finally, we agree that the cost of water can serve as an effective incentive to conserve and support your exploration of drought surcharges or penalties. Conservation price structures have proven effective as well but must be done within reason. While there are certainly price levels that would make everyone conserve water, these policies should also be crafted with care so they don't result in water that is unaffordable for the consumer.

Thank you in advance for your consideration on this very important issue. Please do not hesitate to call if we can be of any assistance.

GGIA
GEORGIA GREEN INDUSTRY ASSOCIATION

Exemptions as listed in Water Stewardship Act:

1. Commercial agricultural operations as defined in Code Section 1-3-3;
2. Capture and reuse of cooling system condensate or storm water in compliance with applicable local ordinances and state guidelines;
3. Reuse of gray water in compliance with Code Section 31-3-5.2 and applicable local board of health regulations adopted pursuant thereto;
4. Use of reclaimed waste water by a designated user from a system permitted by the Environmental Protection Division of the department to provide reclaimed waste water;
5. Irrigation of personal food gardens;
6. Irrigation of new and replanted plant, seed, or turf in landscapes, golf courses, or sports turf fields during installation and for a period of 30 days immediately following the date of installation;
7. Drip irrigation or irrigation using soaker hoses;
8. Hand-watering with a hose with automatic cutoff or handheld container;
9. Use of water withdrawn from private water wells or surface water by an owner or operator of property if such well or surface water is on said property;
10. Irrigation of horticultural crops held for sale, resale, or installation;
11. Irrigation of athletic fields, golf courses, or public turf grass recreational areas;
12. Installation, maintenance, or calibration of irrigation systems; or Hydroseeding.

Sincerely,

Donal Nichols- Chairman Sherry Morris- Executive Director Chris Butts- Legislative Affairs

The Georgia Green Industry Association is a statewide trade organization for the horticulture industry in Georgia. Our membership includes landscape contractors, irrigation contractors, wholesale nursery growers, greenhouse operators, retail garden centers and allied sales companies. GGIA serves as a true umbrella association for the entire horticulture industry.

Georgia Mining Association

Cash, Tim

From: Quintrell, Randy <Randy.Quintrell@sutherland.com>
Sent: Tuesday, August 19, 2014 3:56 PM
To: Cash, Tim
Cc: Capp, James
Subject: RE: Draft Drought Rules
Attachments: Scanned from a Xerox multifunction device.pdf

Gentlemen:
Attached are comments from the Georgia Mining Association.
Thank you,
Randy Quintrell

Office 404-853-8366

GEORGIA MINING ASSOCIATION

August 19, 2014

VIA E-MAIL & FIRST CLASS MAIL

Mr. James A. Capp
Mr. Tim Cash
Water Protection Branch
Georgia Environmental Protection Division
2 Martin Luther King Jr. Drive
Suite 1152 East
Atlanta, Georgia 30334

Re: Comments on Draft Drought Management Rule (the "Rule")

Dear Messrs. Capp and Cash:

I am writing on behalf of the Georgia Mining Association in connection with the draft Drought Management Rule. The Georgia Mining Association is a trade association representing over 200 companies with operations in the State of Georgia. Approximately thirty of these member companies operate mines, employ thousands of workers and produce essential minerals used in many products and applications. The remainder of the membership consists of affiliated companies servicing the mining industry and employing thousands more Georgians. These companies operate in at least 117 of Georgia's 159 counties.

We have been following the EPD's process regarding the Rule including the stakeholder meetings and the written comments filed. Certain segments of the mining industry use relatively little water but certain segments, such as the kaolin industry, are significant water users. We have reviewed the Rule and also we have reviewed the comments filed in this matter by the Georgia Paper & Forest Products Association. We have the same concerns expressed by GPFPA and accordingly we endorse and concur with the GPFPA's comments.

We want to emphasize the comment made by GPFFPA regarding how the Rule does not take into consideration the degree to which a particular sector or user's water use is consumptive. The kaolin industry, which uses significant amounts of water, has conducted water balance studies at its major facilities. These studies show that, like the pulp and paper industry, the mining industry is not a large water "consumer" as over 70% of the water withdrawn from surface and groundwater sources is treated and returned to receiving waters.

4885 Riverside Drive ● Suite 108 ● Macon, Georgia 31210 ● (478) 757-1211 ● FAX (478) 757-1949
http://www.georgiamining.org ● E-mail: gamining@mindspring.com

Thank you for the opportunity to comment and we look forward to working with EPD and other stakeholders in formulating balanced and sustainable water policy for Georgia.

Sincerely,

Randall D. Quintrell
Counsel, Georgia Mining Association

4885 Riverside Drive ● Suite 108 ● Macon, Georgia 31210 ● (478) 757-1211 ● FAX (478) 757-1949
http://www.georgiamining.org ● E-mail: gamining@mindspring.com

Georgia Paper and Forest Products Association

Cash, Tim

From: Quintrell, Randy <Randy.Quintrell@sutherland.com>
Sent: Tuesday, August 19, 2014 2:16 PM
To: Cash, Tim
Cc: Capp, James
Subject: Draft Drought Rules
Attachments: Scanned from a Xerox multifunction device.pdf

Gentlemen:
Please see attached comments of the Georgia Paper & Forest Products Association.
Thank you,
Randy Quintrell

Office 404-853-8366

GPFPA

P.O. Box 27
Lavonia, GA 30553
706-356-2267
FAX 706-356-2269

Georgia Paper & Forest Products Association, Inc.

August 19, 2014

BY E-MAIL & FIRST CLASS MAIL

Mr. James A. Capp
Mr. Tim Cash
Water Protection Branch
Georgia Environmental Protection Division
2 Martin Luther King Jr. Drive
Suite 1152 East
Atlanta, Georgia 30334

Re: Comments on Draft Drought Management Rule (the "Rule")

Dear Messrs. Capp and Cash:

The Georgia Paper & Forest Products Association (GPFPA) represents 11 companies that produce and distribute pulp and paper products at over 35 locations throughout Georgia. The paper and forest products industry is one of the leading industry sectors contributing to Georgia's economy and providing tens of thousands of jobs and hundreds of millions of dollars in state and local tax revenues and other economic benefits. Pulping and papermaking are water-based processes. As a result, the paper and forest products sector is one of the more significant water using sectors in Georgia and could be affected by rules such as these as much as, and perhaps more than, any other industry sector. We appreciate the opportunity to comment on the Rule.

The GPFPA has several concerns regarding the Rule. Those concerns are listed below:

(1) Most of the Rule seems to be aimed at municipal/public water systems and residential/commercial uses and not at industrial/manufacturing uses of water. The intent seems to be that industrial users will be governed by the Drought Contingency Plans incorporated into their withdrawal permits. Language should be added to the rule making this clear. We suggest removing industrial use permittees from the definition of "Permittee" as was done for farm use permittees.

(2) We oppose the suggested changes to Rules 391-3-6-.07 and 391-3-2-.04 regarding the requirements of Drought Contingency Plans. The current rules are sufficient and allow applicants and EPD the needed flexibility to deal on a case-by-case basis with drought measures that make sense for each industrial user's circumstances.

(3) The Rule should give adequate recognition to the fact that most industrial users have become more efficient water users over recent decades. The US pulp and paper industry has a long history of responsible water management. Since 1975, there has been a 55% reduction in process effluent discharge within the US pulp and paper industry (AF&PA 2014). In addition, the water that is withdrawn is used efficiently within the mills. It is estimated that the US pulp and paper industry has an average recycle ratio of eleven, meaning that every one gallon of water that is withdrawn from a water source is used on average eleven times within the manufacturing process before discharge (NCASI 2011). Industrial users, and particularly those that compete in global markets such as GPFPA members, must be efficient water users to stay in business because withdrawing, pumping, circulating, using and treating water are energy-intensive and very expensive. Additionally, more and more of our customers are requiring evidence that we are minimizing our "environmental footprint" by, among other things, being efficient users of water. Any requirement that water usage be reduced during periods of drought should not penalize efficient users but should use a benchmark that takes into consideration voluntary efficiency measures already taken and incentivizes industrial users to continue to take such voluntary measures.

(4) The Rule does not take into consideration the degree to which a particular sector or user's water use is truly consumptive, i.e. apparently it treats all users the same whether their use is 100% consumptive or 0% consumptive. The pulp and paper industry is not a large water "consumer" because over 90% of the water withdrawn from surface and groundwater sources is treated and returned to receiving waters (NCASI 2009). If the water is not consumed but is only used temporarily and then discharged back to the receiving stream, there is little drought-related benefit to reducing water withdrawals. Also, under these circumstances enhanced reporting of withdrawals provides little or no benefit as well.

In summary, the pulp and paper industry has long recognized that water conservation and efficiency are critical and the industry has heavily invested in measures to further these goals over the last several decades. In light of that, additional regulations that do not clearly provide direct benefits during drought conditions should not be imposed. We would welcome the opportunity to continue to collaborate with EPD and other stakeholders in formulating approaches to manage Georgia's water resources in a prudent, sustainable cost-effective manner.

Sincerely,

Randall D. Quintrell
Counsel, GPFPA

References:

American Forest and Paper Association (AF&PA). 2014. 2014 AF&PA sustainability report. http://www.afandpa.org/docs/default-source/one-pagers/-2014-sustainability-report.pdf?sfvrsn=0

National Council for Air and Stream Improvement, Inc. (NCASI). 2011. *General analysis of water recycle at pulp and paper mills*. NCASI White Paper. Research Triangle Park, NC: National Council for Air and Stream Improvement, Inc.

National Council [of the Paper Industry] for Air and stream Improvement, Inc. (NCASI). 2009. Water profile of the United States forest products industry. Technical Bulletin 0960. New York: National Council of the Paper Industry for Air and Stream Improvement, Inc.

Georgia Poultry Federation

Cash, Tim

From: Mike Giles <mike@gapf.org>
Sent: Tuesday, August 19, 2014 10:03 AM
To: Cash, Tim
Cc: Jac Capp
Subject: Comments on Stakeholder Draft

Tim,

We appreciate the opportunity to provide comments on the stakeholder draft of proposed amendments to EPD's Drought Management Rules.

The poultry industry depends heavily on the use of water primarily at processing facilities. While there are exceptions, typically a poultry processor is a customer of a public utility. The water used enables the facility to process the birds, and it is a primary tool used to meet stringent USDA food safety standards.

It is also important to note that water use in a poultry processing facility is not primarily a consumptive use. Process waste water is returned to the public utility for further treatment and ultimate discharge back into surface waters of the state.

The poultry industry is committed to being a responsible steward of our state's water resources. The industry has made tremendous strides in water conservation practices during non-drought and drought conditions over the years (despite the significant financial disincentive to do so which I will discuss more below.)

The following is a list of concerns and questions about the stakeholder draft and water conservation in general relative to the poultry industry:

Drought Surcharge Program -- We understand the logic behind the policy of developing drought surcharge pricing to reduce water demand. For large commercial water users, however, the policy is likely to only serve as a financial penalty during drought periods. Because the industry has already implemented many conservation measures and because the demand for processing birds that are already in the logistical pipeline will not be reduced during a drought, it will be very difficult or impossible to reduce water use at a level that will offset the surcharge which seems to be the goal of the policy. This is especially true due to the stringent USDA food safety standards that must be met by our industry.

In the poultry industry, there is a practical limit on how much water conservation can be achieved. A drought surcharge will serve more as a penalty than it will as an incentive.

A financial incentive to reduce water use already exists in North Georgia, but unfortunately it is offset by the reality of how public utilities are financed and funded. The North Georgia region has the highest water and sewer rates of any other poultry producing region of the nation (by a large margin). This places Georgia poultry producers at a serious competitive disadvantage. In a normal cost/reward situation, a poultry company could invest capital to conserve water and save on water and sewer rates. The return on investment and pay-back period would be certain.

When a poultry producer is the customer of a public utility, however, it is most likely the utility's largest customer and source of revenue. Achieving conservation causes a loss of revenue for the utility, which causes the utility to raise rates in order to remain financially viable. Any savings through capital investments are ultimately offset by higher rates. This isn't a criticism of the public utilities; it is simply the reality of operating a public water utility. The ironic part is that the largest customer, the one who essentially helped build these systems to the benefit of other users, is penalized for trying to conserve water.

We believe that a drought response plan should acknowledge that perhaps the greatest opportunities exist during non-drought periods. Until this disincentive is addressed in some way, many opportunities for further conservation will be missed.

Question: "Farm uses" are defined in the rule, but unless I missed it, I do not see any reference to this term in the following rule sections. Is there any intention to treat farm uses differently?

Consumptive Use -- Is it possible for utilities with very large commercial water users (not consumptive use) to have some flexibility in terms of meeting targets for water use and the application of drought surcharges if this policy remains in the final rule?

Thank you again for the opportunity to provide comments. As the stakeholder process moves forward, we encourage EPD to continue to consider the implications that this rule and the state's overall policy will have on the poultry industry and other large water users.

Mike Giles
Georgia Poultry Federation

Georgia Power

Cash, Tim

From: Williams, Alicia F. <AFWILLIA@southernco.com>
Sent: Tuesday, August 19, 2014 11:55 AM
To: Cash, Tim
Cc: Wetherington, J. Burns
Subject: Georgia Power Comments - Stakeholder Meeting #2
Attachments: Georgia Power comments - stakeholder meeting #2 08_19_2014.pdf

Tim,
Please see that attached comments for the proposed Drought Management Rule, Stakeholder Meeting #2. A hardcopy of this document will be forwarded to your office as well.

Thanks,

Alicia F. Williams
GPC Environmental Affairs | Office 404.506.3075 | Cell 404.735.2794

Environmental Affairs
Bin 10221
241 Ralph McGill Blvd, NE
Atlanta, Georgia 30308-3374

GEORGIA POWER
A SOUTHERN COMPANY

August 19, 2014
CERTIFIED MAIL

Mr. James A. Capp
Chief, Watershed Protection Branch, EPD
2 Martin Luther King Jr. Drive, Suite 1152 East
Atlanta, GA 30334

RE: Drought Management Rule – Stakeholder Meeting #2

Dear Mr. Capp:

Georgia Power Company (GPC) respectfully submits its comments in response to the Environmental Protection Division's (EPD) second stakeholder meeting, the proposed implementation of a new Drought Management Rule ("draft rule") and associated changes to the Georgia Water Quality Control Rule (391-3-6). GPC appreciates the open process that EPD has undertaken in engaging with stakeholders in formulating this unofficial draft rule, or "strawman" rule. GPC remains committed to water conservation and we look forward to working with EPD throughout the stakeholder process.

As an initial matter, EPD should consider whether this rulemaking is necessary or whether the current regime is already meeting the State's needs in preparation for and during times of drought. So far, EPD has not provided an adequate justification of the need for these rules or an explanation of why the existing rules are insufficient. We believe that the current regulations are sufficient – particularly with respect to industrial users – to meet EPD's goals and statutory mandate in this regard. Further, EPD's stated aim of producing a draft rule by year's end is too aggressive. It is important to provide adequate time for stakeholders to present detailed input, and for EPD to consider the various ways in which a new rule could affect both the environment and the economy.

Should EPD decide to go forward with promulgating a new rule, we believe that several changes could improve its overall direction and more adequately address the State's goal of reducing water usage during times of drought. Our specific recommendations are provided below.

Drought Response Committee. GPC agrees that a Drought Response Committee should play an important role in advising the EPD Director on issues related to drought conditions and drought management. However, we believe that the draft rule should formalize the composition of the Committee and detail the Committee's roles and responsibilities. Specifically, we believe that the Committee should be composed of a diverse group of interests and expertise and include representatives from government, the scientific community, industry and agriculture. This type

of broad composition would best serve the Director's need for timely and comprehensive information during drought and non-drought conditions.

We also think that the Committee should be empowered to make non-binding recommendations to the Director. By providing the Committee with this power, the Committee members would be more apt to thoroughly discuss the relevant drought-related issues in order to reach a consensus. Without the power to make recommendations, we believe that the Committee has less of an incentive to distill the varying viewpoints into an actionable conclusion which would be useful to the Director.

Recordkeeping and Reporting Requirements. The draft rule's recordkeeping and reporting provision requires permittees to submit monthly water use figures to EPD. As the definition of "permittee" includes both public water systems and industrial users, it suggests that the recordkeeping and reporting requirements apply to both. However, the monthly reporting form which EPD released as part of the second stakeholder meeting appears to only apply to public water systems – not only does the form require a "water system identification number" and the name of the public water system, but the categories for data input are all only applicable to public water systems.

EPD should redraft this provision to make it clear that the reporting requirements apply only to public water systems. Further, the provision should make clear that the public water systems to which the recordkeeping and reporting requirements apply are only to those which offer water for sale or re-sale. (Incidentally, this change should also be made to the requirements for surcharge pricing).

In any event, we also believe that the frequency in which water reporting is performed should be based on drought criteria. In non-drought periods, we think EPD's need for data could be met in a less burdensome manner by requiring reporting on a quarterly basis. In times of drought, reporting frequency could be increased based on the severity of the condtions. We further believe that the reporting requirement should not be implemented until EPD has established a mechanism to transmit the relevant data electronically.

Drought Declarations. We believe that the draft rule provides insufficient guidance to the Director on what indicators and conditions warrant a specific drought declaration level. That is, while the draft rule specifies that Level 1 is the least severe drought condition and Level 3 is the most severe, there are no specific milestones or benchmarks for the Director to follow in determining which drought level, if any, would be appropriate. We believe that, at a minimum, the draft rule should establish a framework that distinguishes between the conditions which would trigger each drought level.

Such a framework should be detailed, transparent, and comprehensive so that water users can themselves anticipate both when a drought declaration is imminent, and the level of severity of the declaration. Not only should the framework require that the Director consider relevant environmental and meteorological factors, but the framework should also take into account economic considerations. This type of transparent framework would assist water users in

making preparations for implementing the requirements of each drought level and for taking the necessary steps to reduce water use.

Further, we believe that the rule should establish "non-drought conditions" as the default condition absent a declaration by the Director. Once a drought declaration has been issued, we think that the rule would be strengthened by requiring that the Director reevaluate the indicators and criteria on monthly basis to determine whether the declared drought level remains appropriate.

Numeric Water Usage Reduction. The draft rule provides that during Drought Level 3, industrial and commercial permittees must implement water usage reduction measures described in drought contingency plans which are part of their water withdrawal permits. We believe that this provision is unnecessary. As currently written, those water withdrawal regulations and drought contingency plan requirements adequately address water usage in times of drought.

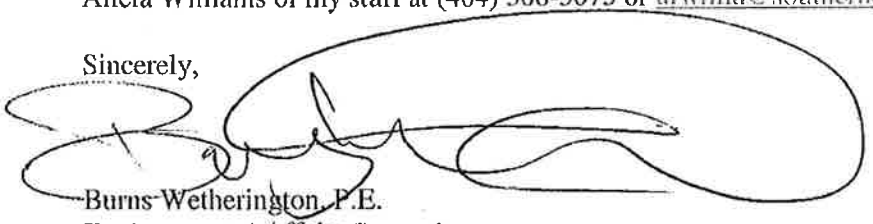
That said, the draft rule should make clear that any water use reductions automatically terminate upon a decrease in the Drought Level. Further, the water use reduction provision should make an allowance for situations where water usage from the previous year is not an appropriate baseline for setting water use reduction targets. And, it should expressly state that the reduction target should be based on measures which do not require the applicant or permittee to expend additional funds.

Variance Requests. As an initial matter, we believe that the draft rule should establish relevant factors that the Director should consider in determining whether to issue or deny a variance request. One of these factors should be whether the variance is sought for a water use which supports infrastructure of critical importance to the State, such as its power generation facilities.

The draft rule provides, among other things, that "Permittees whose water supply is obtained in whole or part from storage in or releases from any project owned and operated by the United States Army Corps of Engineers may not request a variance for restrictions that are less stringent than those described in this Rule." We are unclear what exactly this provision is meant to prohibit and believe that EPD should provide additional detail as to this provision.

We appreciate your consideration of our comments. If you have any questions, please contact Alicia Williams of my staff at (404) 506-3075 or afwillia@southernco.com.

Sincerely,



Burns Wetherington, P.E.
Environmental Affairs Supervisor

AFW

Georgia Water Alliance

Cash, Tim

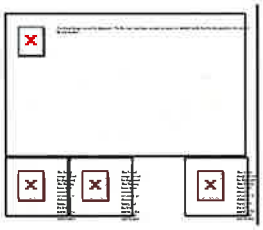
From: Anup Shah <AShah@macoc.com>
Sent: Tuesday, August 19, 2014 4:25 PM
To: Cash, Tim
Cc: Capp, James
Subject: Drought Management Rule - Comments from the Georgia Water Alliance
Attachments: GWA_DroughtMgmtRuleComments.pdf

Dear Tim,

The Georgia Water Alliance (GWA) is pleased to provide comments regarding the strawman of a new drought management rule. Please see attached.

On behalf of the GWA, Thank You for seeking early discussion and input in this process. GWA members are fully committed to water conservation and water-use efficiency and welcome the opportunity to engage in a dialogue to craft effective and meaningful drought management rule. Please do not hesitate to reach out for any additional input.

Sincerely,
Anup



Anup Shah
VP Environmental Affairs, Public Policy
Metro Atlanta Chamber
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404.586.8540 • Cell 404.274.9537 • FAX 404.586.8427
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GEORGIA
WATER ALLIANCE

August 19, 2014

Mr. James A. Capp, Chief
Watershed Protection Branch
Georgia Environmental Protection Division
2 Martin Luther King Jr. Drive, Suite 1152
Atlanta, GA 30334

RE: Strawman of the Proposed Amendments to the Drought Management Rules, Chapter 391-3-30

Dear Mr.Capp:

The Georgia Water Alliance (Alliance) is pleased to provide comments regarding the strawman of a new drought management rule that would replace the current Rules for Outdoor Water Use and the 2003 Drought Management Plan.

We thank you for seeking early discussion and input from targeted organizations potentially impacted by this rule. Given the potentially enormous impact on the broad business, local governments, industrial and utility community, we sought input from a wide range of organizations in preparing these comments. We respectfully believe that considerable changes to this draft rule and continued dialogue are needed before moving forward.

In reviewing the scope of this strawman and related documents, Alliance members agree on the following:

- We are fully committed to water conservation and water-use efficiency. Our past actions and achievements demonstrate that this commitment can and will occur without the new drought programs introduced in the proposed rule.
- We firmly believe that adoption of the rule, as currently proposed, has the potential to unnecessarily create significant economic competitiveness issues for Georgia's business, industry, local governments and utility sectors.
- Considering the significant strides over the last decade, we must acknowledge the looming "hardening" that exists within the regulated community. As we continue to be more efficient, there is less "wasted" water to manage. Thus, the notion that the regulated community could reduce water consumption by 5, 10 or 20 percent without drastic impacts on production, employment and future expansion plans is without premise.
- Water use reductions described in the proposed drought management rule strawman and mandatory drought surcharge requirements are unnecessary given current conservation efforts, associated demand hardening and complexity of billing systems.

GEORGIA
WATER ALLIANCE

- To reduce confusion, a simple rule consistent with the Water Stewardship Act (WSA) is all that is necessary. EPD should reference in the Drought Management Rule the outdoor water use schedules and exceptions provided by the WSA. One such approach is suggested in the Appendix with this letter.
- We support the convening of a Drought Response Committee that includes not only municipal water suppliers and self-supplied industries, but also the many industrial/commercial and urban agriculture sectors served by local water providers. Such a committee will provide basin-specific input and recommendations to the EPD Director as water use reductions are considered.
- We are prepared to work with EPD to identify the key stakeholders and relevant sectors in each basin including but not limited to municipalities, food and beverage production, chemical and textile manufacturing, power supply, general manufacturing and urban agriculture/green industries.
- We support processes and policies that clearly promote existing water conservation practices, delaying the need for drought declarations.
- We recommend that any new reporting requirements, such as those currently proposed for municipal water providers, be meaningful and non-duplicative.

Thank you for your consideration of these comments. Ensuring a sustainable, long-term water supply is important to the State of Georgia and so we welcome the opportunity to continue this dialogue and provide input as key stakeholders.

Sincerely,

Anup Shah on behalf of
THE GEORGIA WATER ALLIANCE

cc: Mr. Tim Cash, EPD
Mr. Nap Caldwell, EPD

The Georgia Water Alliance is a broad coalition of stakeholders representing business, local government, water service providers, utilities and agribusiness interests. The Georgia Water Alliance (Alliance) was formed in 2006 to provide a unified voice during the development and implementation of Georgia's Comprehensive Statewide Water Management Plan (State Water Plan). We fully support the legislature's water policy statement that "Georgia manages water resources in a sustainable manner to support the state's economy, to protect public health and natural systems, and to enhance the quality of life for all citizens."

Please direct inquiries about the Georgia Water Alliance, c/o Mr. Anup Shah, Vice President – Environmental Policy, Metro Atlanta Chamber, 235 Andrew Young International Boulevard, NW, Atlanta, GA 30303 or ashah@macoc.com.

Appendix A

Suggestions for the Drought Management Rules

Drought management rules need to have concise, specific action items and be streamlined to minimize complexity and confusion. To that extent, the GWA suggests to restructure Water availability / drought conditions in each basin as following water use phases:

1. **Non-drought.**
    - This is the water restrictions/exceptions in the Water Stewardship Act (Act).

2. **Declared drought.**
    - This is equal to the water restrictions/exceptions in the Act.
    - Once Drought is declared, a concerted public education and customer notification campaign by local governments should be made. This effort would stress the need to conserve water and the need to follow the restrictions.
    - Local governments should intensify enforcement of the restrictions (but no new or different restrictions will be imposed).
    - EPD director convenes the Drought Response Committee with key stakeholders from the basins affected by the drought.
    - Drought Response Committee begins deliberations for triggers (indicators) to declare a Water Shortage Emergency and comes up with action plan to reduce water consumption beyond the Water Stewardship Act.

3. **Water shortage emergency.**
    - If a local government petitions EPD that it believes it will have water shortages, EPD will invoke its powers under the current water statutes and declare a water shortage emergency in that water system.
    - Water restrictions will be imposed specific to the affected basin as recommended by the Drought Response Committee which includes key stakeholders in the affected basin.
    - These will be different than the routine restrictions in the Water Stewardship Act. This could be a total ban on outdoor water use if that is necessary. (Note that the current law gives EPD this authority). This has been used sparingly in previous droughts but, hopefully, will not be needed in the future since local

governments have since taken steps to secure better water sources.)

4. **Declaration of non-emergency and non-drought**
    - If the key drought indicators continue to improve and the long-term forecast of water availability gets better, EPD director in concert with the Drought Response Committee may consider lifting of the water shortage emergency and associated additional water restrictions. At this point the affected basin goes back to following the protocols and procedures identified for the drought conditions.
    - If the water availability and rain forecast continues to improve then the Drought Response Committee may recommend EPD director to declare the drought to be over. At this point, the EPD director may dissolve the Drought Response Committee' and the affected basin goes back to non-drought mode of operation.

We believe the above structure provides the following advantages:

- It maintains clarity (less confusion) for water users. We believe that publication and enforcement of the consistent water use restrictions will be more effective in reducing water use than to confuse the public with new restrictions.
- Variances to be more stringent than the Water Stewardship Act could be considered by EPD if a local government desires such. This variance procedure would be as provided in the Water Stewardship Act.
- As now proposed, industrial water suppliers will follow their approved water conservation plans; no additional requirements are necessary.
- No additional reporting by local governments would be required.
- There will be no need for target reduction levels and a drought surcharge.
- There will be less number of requests for variances to be less stringent as EPD will not be imposing water restrictions more stringent than the Water Stewardship Act. Variance requests may arise only if a water emergency is requested by a local government.

This restructuring will achieve the EPD stated goals of protecting water supplies for public health and complying with the water statutes. This restructuring puts the emphasis on local governments to properly manage their water resources within permit limits with minimal involvement through imposed water use restrictions.

GEORGIA WATER ALLIANCE

American Chemistry Council
Allied Golf Council
American Council for Engineering Companies of Georgia
Associated General Contractors of Georgia
Association County Commissioners of Georgia
Atlanta Home Builders Association
Atlanta Regional Commission
City of Austell
City of Savannah
Coastal Landscape & Turf Association
Columbus Water Works
Council for Quality Growth
Dalton Utilities
Georgia Agribusiness Council
Georgia Apartment Association
Georgia Association of REALTORS
Georgia Association of Water Professionals
Georgia Beverage Association
Georgia Chamber of Commerce
Georgia Chemistry Council
Georgia Coalition for Sound Environmental Policy
Georgia Construction Aggregate Association
Georgia Economic Developers Association
Georgia Electric Membership Corporation
Georgia Engineering Alliance
Georgia Forest & Paper Products Association
Georgia Forestry Association
Georgia Industry Association
Georgia Industry Environmental Coalition
Georgia Mining Association
Georgia Municipal Association
Georgia Poultry Federation
Georgia Pulp and Paper Association
Georgia Sod Producers Association
Georgia Textiles Manufacturers Association
Georgia Traditional Manufacturers Association
Georgia Turfgrass Association
Georgia Urban Agriculture Council
Greater Atlanta Home Builders Association
Homebuilders Association of Georgia
Macon Water Authority
Metro Atlanta Chamber
Metro Atlanta Landscape & Turf Association
Oglethorpe Power Corporation
Regional Business Coalition
Southern Company
The Associated General Contractors
Urban Agriculture Council

Georgia Water Coalition

Cash, Tim

From: Chris Manganiello <chris@garivers.org>
Sent: Tuesday, August 19, 2014 11:26 AM
To: Cash, Tim
Cc: chris@garivers.org
Subject: Drought Management Rule - Stakeholder Meeting #2
Attachments: 2014_08_19_GWC_Drought Management Rule - Stakeholder Meeting #2 comment letter_final.pdf

Mr. Cash,

The attached comments are submitted on behalf of the Georgia Water Coalition in response to the Environmental Protection Division's (EPD) request for input following the July 15, 2014 Stakeholder Meeting #2 regarding the pending revision to Georgia's Drought Management Rule. Thank you for providing this opportunity. Please let me know if you have any questions.

Sincerely,

Chris

Chris Manganiello, Ph.D.
Policy Director

Georgia River Network
126 South Milledge Avenue, Suite E3
Athens, GA 30605
Office: 706-549-4508
Fax: 706-549-5491

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GEORGIA WATER COALITION

August 19, 2014

James A. Capp
Chief, Watershed Protection Branch
Environmental Protection Division
Suite 1152 East Tower
2 Martin Luther King Jr. Drive
Atlanta, GA 30334

Submitted via email to: tim.cash@dnr.state.ga.us

SUBJECT: Drought Management Rule – Stakeholder Meeting #2

Dear Mr. Capp and Mr. Cash:

These comments are submitted on behalf of the Georgia Water Coalition in response to the Environmental Protection Division's (EPD) request for input following the July 15, 2014 Stakeholder Meeting #2 regarding the pending revision to Georgia's Drought Management Rule.

The Georgia Water Coalition (GWC) is a group of more than 200 organizations representing well over a quarter of a million Georgians including farmers, homeowner and lake associations, business owners, sportsmen's clubs, conservation organizations, professional associations and religious groups. The GWC's mission is to protect and care for Georgia's water resources, which are essential for sustaining Georgia's prosperity, providing clean and abundant drinking water, preserving diverse aquatic habitats for wildlife and recreation, and strengthening property values. A list of coalition members is attached to this letter.

While we appreciate the extended public comment period for these comments, more broadly, the relatively fast pace at which EPD is developing this rule in 2014 raises concern that EPD and various stakeholders are missing an opportunity for more thorough drought response planning, both in rulemaking and beyond the scope of rulemaking. Given the many good models for drought response in other states where the economy and environment have suffered in recent droughts, much like Georgia's has, a more deliberate, thorough, inclusive approach to policymaking is clearly called for.

We have advocated for a finalized state drought management plan for many years, and we support EPD's efforts to update the 2003 Drought Management Plan and the Rules for Outdoor Water Use at Georgia Rules and Regulations Ch. 391-3-30 et seq.

Primary Goal

EPD's stated goal for this rulemaking is to make sure that public water systems have the water supplies they need during drought. Furthermore, the legislature enabled – and has required – EPD to make these rule changes and conform to the Water Stewardship Act (2010). We think the stated goal is far too limited in its scope. The goal(s) should include protecting the property rights of all riparian owners, and protecting the public rights for all instream uses and users.

Drought planning and management must be proactive activities. As demonstrated in the Alliance for Water Efficiency's and the San Antonio Water System's report – *Considerations for Drought Planning in a Changing World* (January 2014) – smart "long-term demand reduction programs" and "short-term curtailment strategies" are the key components of drought management for municipal water providers.[1] Georgia has experienced water supply shortages exacerbated by population growth and drought conditions, including four droughts in the last ten years. Drought and water supply planning must become permanent, year-round activities for state and local government. EPD has an opportunity to implement sound long-term reduction programs, i.e. water efficiency and conservation plans. More germane to this rulemaking process, EPD's drought management, response and emergency planning can meet short-term curtailment needs if properly designed.

Applicability

The drought rule should apply equitably to all groundwater and surface water permit holders. EPD's stated goal of only maintaining public water supply during drought cannot be met in all portions of the state without a comprehensive approach that includes regulation of all users. In parallel, the stated goal is too limited in scope. Other legal uses and rights must be protected during drought as well (riparian agricultural uses and rights, public and private instream uses for fishing, navigation and swimming), property values must be protected, and public wastewater assimilation uses must be protected. Of course, success at protecting all of these rights and uses can be achieved at the same time. Only with comprehensive drought planning and drought-plan execution can all needs and rights be met and protected. Energy utilities and agricultural users must be subject to the rule's requirements and provisions along with municipal and other industrial (non-energy) users.

Municipal and public water systems: While the rule is written to capture any entity with a water withdrawal or drinking water permit – and because agricultural and industrial permittees are excluded from significant action until drought severity reaches the highest level – the bulk of the drought rule appears to fall on public water utilities, and particularly those that utilize more than 1 MGD. If the rule is designed to protect public water supply, then all suppliers regardless of volume ought to comply. There are over 24,000 public water systems in the state, but only 419 exceed 1 MGD, or roughly 1.7% of water systems. Admittedly, this would cover a large percentage of the population, but the rule still leaves a significant number of users unaffected by the proposed rule and is inequitable.

---

[1] Alliance for Water Efficiency and the San Antonio Water System, *Considerations for Drought Planning in a Changing World* (January 2014), http://www.allianceforwaterefficiency.org/drought_introduction.aspx.

We also recommend EPD to address other outdoor water use, including pools, pressure washing, car washing, and irrigation of athletic fields and recreational turf, which were left largely unaddressed by the Water Stewardship Act and are subject to archaic odd-even scheduling for homeowners and are largely exempt for commercial users.

Agriculture: EPD staff managing the drought management rulemaking process are misrepresenting the scope of the pending revisions of the Flint River Drought Protection Act to stakeholders. The agricultural irrigation efficiencies required of SB 213 will only apply to the "affected areas" as defined in the statute. Those affected areas are restricted to the Flint River basin, and more specifically to "those specific portions of the state lying within the Flint River basin where ground-water use from the Floridan aquifer can affect stream flow or where drainage into Spring Creek, Ichawaynochaway Creek, Kinchafoonee Creek, and Muckalee Creek occurs." In the context of the drought management rulemaking process, this means that agricultural growers with water withdrawal permits throughout the remainder of the state are under no obligation to conserve or observe the agricultural efficiencies required of Flint River basin irrigators. Thus the draft Rule and the scope of the Rule excludes at least 16,000 of the over 24,000 agricultural permits in Georgia. Substantially more than two-thirds of these permits are direct withdrawals from surface waters. Most of these permittees withdraw from underground sources with varying and poorly understood connections to surface water, given that they are outside of the Dougherty Plain where surface-to-groundwater connections are marginally understood at best.

Moreover, recreational turf should not be treated as a farm use and therefore exempt from the rule; rather, recreational turf should be treated as we treat golf courses, which have Best Management Practices in place along with restrictions that tighten during severe drought. Adding to the complication, some water suppliers rely on sources both within and outside the Chattahoochee Basin (e.g., Cobb County Water System). Exempting irrigation for recreation turf outside the upper Chattahoochee basin is inequitable and will create an enforcement nightmare for those utilities at issue.

Industry: EPD has not clearly explained the rationale for why industry – and by extension energy utilities – are under no obligation to act until EPD declares a drought level 3, at which point industries with water withdrawal permits will follow the drought contingency plans contained in their individual water withdrawal permits.

Energy utilities and agricultural users must be subject to the rule's requirements and provisions. Thermoelectric and agricultural water withdrawals combined have historically exceeded seventy-five percent of total withdrawals. While the total volume of thermoelectric returns is significant, the environmental and downstream effects of thermoelectric returns intensify during drought events.[2] Additionally, a 'drought rule' or plan that does not address the sheer magnitude and also complexity of agricultural uses will fail to protect the complete suite of property rights and uses that Georgian's enjoy.

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[2] U.S. Geological Survey, *Water Use in Georgia by County for 2005; and Water-Use Trends, 1980-2005*, Scientific Investigations Report 2009-5002, p. 6, http://pubs.usgs.gov/sir/2009/5002/pdf/2005_water_use_book_508_V4.pdf.

Drought Triggers and Indicators

The GWC reiterates the recommendation that EPD should consider more drought indicators and triggers in addition to precipitation, reservoirs levels, groundwater levels and stream flow already included in the Drought Management Plan (2003). Relying on multiple indicators to determine drought conditions at the local level will ensure that water management response appropriately addresses local water supply needs. Science-based triggers and indicators are recommended by water management professionals, and they are not arbitrary if they are directly linked to specific action and response to meet short-term curtailment.

The American Water Works Association – in the *M60 Drought Preparedness and Response Manual* (2011) – articulates seven critical components to any drought management and response process:[3]

1. Form a water shortage response team
2. Forecast supply in relation to demand
3. Balance supply and demand and assess mitigation options
4. *Establish triggering levels*
5. Develop a staged demand reduction plan
6. Adopt the plan
7. Implement the plan

According to the manual, "There will be enormous pressure to not declare a water shortage. It is important that triggers be clearly defined and documented as part of the adopted water shortage contingency plan. Imposing restrictions, significant water rate increases, or rationing often results in upset customers that foresee damage to their businesses, homes, and lifestyles. Political leaders need clearly defined triggers to make decisions when there is a water supply problem."

Therefore, Georgia's drought management plan must include clear, science-based "triggering levels" and indicators for determining drought level/response. For example, if stream flow or reservoirs levels reach '*x*,' then EPD declares drought level/response '*y*.' Relying on the discretion of the EPD Director as opposed to clear, science-based indicators for determining drought ***politicizes the implementation process*** and gives local governments little ability to manage their water supplies in an adaptive as opposed to reactive manner.

Clear, science-based indicators also provide local and state policy makers with an objective process, quelling any controversy associated with vague, undefined, or discretionary indicators.

Recently, EPD staff has shared with GWC representatives the existence of a drought-determination technical rubric for the lower Flint River. While we have not seen or been otherwise briefed on the details of the rubric, we believe such an approach has promise and call for its publication so we can evaluate it further. We also urge EPD to consider a similar approach for all Georgia watersheds, with codification. Should science change substantially, the Rule can change. Any arguments against the unwieldiness of codification are mitigated by the fact that such science is indeed slow to change, and, more importantly, that the recent, proven

[3] Alliance for Water Efficiency, *Considerations for Drought Planning in a Changing World*, see p. 7.

politicization of drought management has been highly destructive to the property rights and uses of hundreds of thousands of Georgians.

Furthermore, the stakeholder and rulemaking process has yet to address the structure and authority of the Drought Response Committee. At a minimum, the Committee should have broad stakeholder representation from both the public and private sectors, and obviously include representatives from regions affected.

Drought Response Levels

The GWC understands the concerns some utilities have with EPD's drought surcharge proposal, particularly those utilities whose customers already pay high water rates (e.g., City of Atlanta, DeKalb County). Many of these utilities are in the Metro North Georgia Water Planning District and already have implemented tiered pricing to incentivize water conservation among residential customers. Given EPD's drought surcharge proposal may be unpalatable, EPD instead should consider requiring all utilities to implement effective conservation pricing across residential and commercial sectors.

When properly designed and implemented, conservation pricing encourages sustained reductions in water use as opposed to short-term reductions driven by temporary price hikes. EPD could then recognize – and authorize – the drought surcharge concept as an acceptable tool that EPD would consider in the variance request process. A longer rule development process would allow EPD and stakeholders to more thoroughly discuss conservation pricing and surcharge options.

We understand that EPD is undertaking a concurrent conservation rule making effort, and strongly recommend that the drought and the conservation rule making efforts are integrated rather than occur in isolation.

Conclusion

We thank EPD for the opportunity to provide comment ahead of a formal rule making process. If you have any further questions, please contact Chris Manganiello, Policy Director, Georgia River Network (chris@garivers.org).

Sincerely,

The Georgia Water Coalition

Attachment: Alliance for Water Efficiency and the San Antonio Water System, *Considerations for Drought Planning in a Changing World* (January 2014)

Georgia Water Coalition Partners

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GEORGIA WATER COALITION

ABAC Forestry and Wildlife Club
AKO Environmental Consultants, LLC
Albany Georgia Audubon Society
Altamaha Riverkeeper
American Cane Society
American Fisheries Society – Georgia Chapter
American Rivers
American Whitewater
Anthony W. Park & Associates, LLC
Apalachicola Riverkeeper
Appalachian Education and Recreation Services - Len Foote Hike Inn
Association of Water Treatment Professionals
Athens Grow Green Coalition
Athens Land Trust
Atlanta Audubon Society
Atlanta Water Gardens, Inc.
Atlanta Whitewater Club
Azalea Park Neighborhood
Bee Natural, Inc.
Berkeley Lake Homeowners Association
Bike Athens
Blue Heron Nature Preserve
Broad River Outpost
Broad River Watershed Association
BSA Troop 1134
Burnt Fork Watershed Alliance
Camden County Land Trust
CCR Environmental
Center for a Sustainable Coast
Central Savannah River Land Trust
Chattahoochee Hill Country Conservancy
Chattahoochee Nature Center
Chattahoochee Riverkeeper
Chattahoochee River Warden
Chattooga Conservancy
Cherokee Transitions Green
Citizens for Clean Air and Water
Citizens for Environmental Justice
Clean Coast
Clear Rivers Chorus
Coastal Environmental Organization of Georgia
Coastal Estuary Protection Association
Coastal Georgia Travel
Cochran Mill Nature Center
Compassion in World Farming
Conserve America
Coosa River Basin Initiative
Coosawattee Watershed Alliance
Creative Earth
Cumming Garden Club
DeKalb County Soil & Water Conservation District
Druid Hills Garden Club
Earthkeepers & Company
Earth Ministry, NW Unitarian Universalist Congregation
East Atlanta Community Association
Ens & Outs, Unitarian Universalist Congregation of Atlanta
Environment Georgia
Environmental Community Action, Inc.
Environmental Defense Fund- SE Region
Ewing Irrigation - Covington
Fall-line Alliance for a Clean Environment
Flint Riverkeeper
Fox Environmental
Friends of Barber Creek
Friends of Georgia, Inc
Friends of McIntosh Reserve
Friends of the Apalachee
Friends of the Chattahoochee
Friends of the Savannah River Basin
Friends of South Newport River, Inc.
Garden Club of Georgia, Inc.
Garden*Hood
Georgia Bass Chapter Federation
Georgia Canoeing Association, Inc.
Georgia Coalition for the People's Agenda
Georgia Coalition of Black Women
Georgia Conservancy
Georgia Forest Watch
Georgia Interfaith Power and Light
Georgia Kayak Fishing
Georgia Lakes Society
Georgia Land Trust
Georgia Onsite Wastewater Association
Georgia Poultry Justice Alliance
Georgia River Fishing
Georgia River Network
Georgia River Survey
Georgia Rural Urban Summit
Georgia Wildlife Federation
Georgia Women's Action for New Direction
Glynn Environmental Coalition
Graci's Garden Center
Greening Forward
GreenLaw
Harrison Design Associates
Hiwassee River Watershed Coalition
Hydro Logical Solutions, LLC
Imke Lass Photography
Initiative to Protect Jekyll Island
Interface, Inc.
Izaak Walton League of America- Greater Atlanta Chapter
J. Galt & Associates
Jackson Lake Homeowners Association
Junior Bass Busters
Keller Williams Realty, Lanier Partners
Krull and Company
Lake Allatoona Preservation Authority
Lake Blackshear Watershed Association
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Lake Lanier Association
Lake Oconee Property Owners' Association
Lake Oconee Water Watch
Lake Yonah Association
LAND Architect Studio
League of Women Voters of Georgia
Litter Control, Inc
Little Mountain Water Association
Little Tennessee Watershed Association
Live Thrive Atlanta
Lula Lake Land Trust
Lumpkin Coalition
McIntosh High School Adopt-A-Stream
Melaver McIntosh
Middle Chattahoochee River Stewards
Minds Eye Scenic Arts/Knottalotta Entertainment
Mountain Park Watershed Preservation Society
National Wildlife Federation
Neighborhood Planning Unit – W Atlanta
New Echota Rivers Alliance
NOCRAP (Newly Organized Citizens Requesting Aquifer Protection)
Norris Lake Community Benefits Corporation
North American Native Fishes Association
North Georgia Trout Online
Nuclear Watch South
Oceana
Oconee River Land Trust
Off Grid Expeditions & River Guardians
Ogeechee Audubon Society
Ogeechee Riverkeeper
Okefenokee Adventures
One Entertainment Productions
One Hundred Miles
Paddle4Tomorrow
Patagonia Atlanta
Peter McIntosh Photography
Phillips Seafood
Presbytery of Greater Atlanta
Rabolli Environmental, Inc.
Rain Harvest Company, Inc.
Richmond Hill Garden Club
Ryan Taylor Architects
Sapelo Sea Farms
Satilla Riverwatch Alliance & Satilla Riverkeeper
Sautee-Nacoochee Community Association
Savannah-Ogeechee Canal Society, Inc.
Savannah Riverkeeper
Savannah Tree Foundation
Save Lake Oconee's Waters (SLOW)
Save Our Rivers, Inc.
Scenic Georgia, Inc.
Sierra Club- Georgia Chapter
Silentdisaster.org
Small Carpenters at Large
Snake Nation Press, Inc.
Solomon's Minds
Soque River Watershed Association
South Atlantans for Neighborhood Development
South Fork Conservancy
Southeast Green
Southeastern Horticultural Society
Southeastern Natural Sciences Academy
Southern Alliance for Clean Energy
Southern Conservation Trust
Southern Environmental Law Center
Southern Wings Bird Club
Southface Energy Institute
South River Watershed Alliance
SouthWings: Conservation through Aviation
Spring Creek Watershed Partnership
St. Marys EarthKeepers, Inc.
Storm Water Systems
Surfrider Foundation - Atlanta/Georgia Chapter
Sustainable Atlanta
Tallulah River Watershed Protection Committee
The Concerned Citizens of Shell Bluff
The Dolphin Project
The Erosion Company (TEC)
The Nature Conservancy
The Original Rainwater Pillow
The Outside World
The Rain Barrel Depot
The Rain Saver
The Victor Firm, LLC
The Wilderness Society
Trout Unlimited - Georgia Council
Turner Environmental Law Clinic
Unicoi Outfitters
United Nations Association – Atlanta
Upper Etowah River Alliance
Upper Oconee Watershed Network
Upper Tallapoosa Watershed Group
U.S. Green Building Council, GA Chapter
U.S. Green Building Council – Atlanta Branch
U.S. Green Building Council – Savannah Branch
Watershed Alliance of Sandy Springs
Wayne Morgan Artistry
West Atlanta Watershed Alliance
West Point Lake Advisory Council
West Point Lake Coalition
White Oak Hills Neighborhood Association
World Wildlife Fund
WOWash
WWALS Watershed Coalition
Yellow Bluff Plantation
Yellow River Water Trail

Considerations for Drought Planning in a Changing World

JANUARY 2014

Alliance for Water Efficiency

San Antonio Water System

This paper was funded in part by the
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Introduction

Recent weather patterns have put stress on freshwater supplies throughout the world. During 2012 much of the United States experienced severe and prolonged drought. On August 8, 2012 a National Geographic headline read, "July Hottest Month on Record in U.S. - Warming and Drought to Blame?"[1] At the beginning of 2013 many news outlets were reporting on the National Oceanic and Atmospheric Administration (NOAA) announcement that 2012 was the hottest year on record and the 15th driest year.[2] An analysis of the 2012 drought in the Great Plains reported that the months of May through August were the driest on record for the region, with rainfall deficits exceeding the years of the Dust Bowl.[3] One year later headlines in the media refer to California experiencing its driest calendar year on record.[4] Hot and dry weather has been common in recent years, as have extreme weather events. Some long range climate forecasts predict warmer and drier conditions in the future.

Drought makes it difficult for water providers to offer reliable service, and can threaten the livelihood of a region. Many water providers have plans in place to deal with drought, but not all do. Existing plans may not be up to date, and the same may be true of an agency's general water supply plans and demand forecasts. This paper explores drought planning in a changing world and highlights important considerations to be included in the process. It begins by describing common short-term and long-term demand reduction strategies, briefly reviews the concept of demand hardening, includes examples of past drought response in the United States, provides information about Australia's Millennium Drought and Australian drought strategies, identifies emerging and proactive drought strategies, and discusses climate change and weather uncertainty. The paper concludes with a summary that ties all of this together.

The American Water Works Association (AWWA) M60 Manual defines drought as, "a deficiency of precipitation over an extended period of time, resulting in a water shortage for some activity, group, or environmental purpose." It goes on to say, "A water shortage occurs when supply is reduced to a level that cannot support existing demands."[5] Drought often has a compounding effect on municipal water service areas in that irrigation requirements increase due to the lack of precipitation. In the context of this paper the term drought will adhere to the above definition and focus on municipal water use.

[1] National Geographic Daily News. August 8, 2012. July Hottest Month on Record in U.S. - Warming and Drought to Blame? http://news.nationalgeographic.com/news/2012/08/120808-hottest-month-july-warming-temperature-dust-bowl-nation-science/

[2] NCDC Announces Warmest Year on Record for Contiguous U.S. - http://www.ncdc.noaa.gov/news/ncdc-announces-warmest-year-record-contiguous-us

[3] An Interpretation of the Origins of the 2012 Central Great Plains Drought. March 2013. NOAA Drought Task Force. http://www.drought.gov/media/pgfiles/2012-Drought-Interpretation-final.web-041013_V4.0.pdf

[4] Reuters. (November 27, 2013). California water woes hit hard in driest year on record - http://www.reuters.com/article/2013/11/27/us-usa-california-water-idUSBRE9AQ0M520131127

[5] American Water Works Association. 2011. *Drought Preparedness and Response*. Manual of Water Supply Practices M60. AWWA. Denver, Colorado.

Long-Term Demand Reduction Versus Short-Term Curtailment

Long-term water demand reduction programs and short-term curtailment strategies are two different actions with different goals. Examples of each are discussed in this section and key characteristics of them are outlined in Table 1.

Table 1: A comparison of long-term demand reduction and short-term curtailment

	Long-Term Demand Reduction	Short-Term Curtailment
Purpose	Permanent service area water use reductions.	Respond to drought or other emergency shortage.
Plan Type	Water efficiency and conservation plan.	Drought emergency plan.
Typical Strategy	An economically evaluated, extended plan that incorporates efficiency and conservation into a portfolio of management strategies.	Water use restrictions to manage short-term supply deficits at various stages of drought.
Justification	Often based on the economics of avoided costs or least cost planning.	To provide service that meets basic needs during a supply shortfall.
Outcome	A gradual and sustained reduction in water demand.	An immediate reduction in water demand.

Long-Term Demand Reduction

Long-term water demand reductions are often achieved via increases in efficiency, and represent water supply strategies that maximize utilization of existing resources. They are designed to:

1. Reduce the demand for water;
2. Improve efficiency in use and reduce losses and waste of water; and
3. Improve land management practices to use water more efficiently.

Components of a long-term demand management program often include:

- Full metering and measurement of all customers and water uses.
- Conservation-oriented water rates and pricing.
- Conservation program staff.
- Integrated resources planning.
- Incentives to encourage installation of water efficient fixtures and appliances.
- Programs to improve landscape irrigation efficiency and efficient landscape design such as xeriscaping.
- Efficiency reviews and audits for large commercial and landscape customers.

Water providers often utilize water efficiency programs as an effective means to reduce service area water demand over long-term time horizons. Implementation of such programs may arise from a need to manage demand so it does not exceed available supply, being identified as cost-effective

alternatives to capital improvement projects to expand storage and treatment capacities, or may be politically or environmentally induced. Drought may also be a driver for long-term efficiency program implementation.

The most tried-and-true long-term water efficiency measure is the toilet replacement program. In a home with inefficient fixtures, toilet flushing represents the largest indoor use.[6] Toilet replacement programs are often initiated through a rebate offered by the water provider, or via direct installation. These programs are relatively straightforward to plan and administer, and in the past have provided large reductions in indoor water use. Due to the success of many toilet replacement programs and the natural replacement of older inefficient toilets with 1.6 gpf or less toilets via the Energy Policy Act of 1992 (and a consumer marketplace now dominated by 1.28 gpf fixtures) toilet replacement programs are becoming less appealing. That is, the water efficiency community was so successful with replacement programs, changing federal toilet standards, and promoting market innovation that giving customers financial incentives for toilets provides less certain results than it once did. Every service area is different, however, and many may still have significant opportunity for savings via toilet replacements. Most other indoor residential uses are also now very efficient due to federal standards and a plumbing fixture market place saturated with efficient options. The Energy Policy Act of 1992 created more efficient standards for showerheads (2.5 gpm) and faucets (2.2 gpm) as well. Codes have even reduced commercial faucets to .5 gpm. Clothes washers were assigned efficient standards by the U.S. Department of Energy that began in 2011 and will become increasingly stringent in 2015.[7] Residential dishwashers, urinals, and pre-rinse spray valves also have federal efficiency standards that generate passive savings.

Water efficiency programs often produce a benefit that exceeds the investment. For example, the costs of implementing an efficiency program such as staff salaries, rebates, and marketing materials may produce benefits such as reduced short-run operating costs and avoidance of expensive water treatment and storage expansion. Every service area has a unique set of circumstances that determine the cost-effectiveness of efficiency programs. The Alliance for Water Efficiency paper, *Transforming Water: Water Efficiency as Stimulus and Long-Term Investment* contains cost estimates for a diverse assortment of water efficiency programs that range from $170/million gallons (MG) (USD) ($55/acre-feet (AF)) for rate reform and water budgets to $1,600/MG (USD) ($520/AF) for industrial process. The average cost estimate is approximately $575/MG (USD) ($190/AF). The authors suggest a conservative estimate of $1,000-$1,500/MG (USD) ($325-$490/AF) for a realistic, diverse, and well-implemented set of programs. These costs will vary based on what types of measures a water provider selects for implementation.[8]

Another example of the cost of conserved water can be pulled from the Los Angeles Department of Water and Power (LADWP). LADWP's Technical Assistance (TAP) program provides custom performance-based incentives for retrofitting water-intensive equipment such as cooling towers. LADWP's TAP program has an estimated unit cost of $700/MG (USD) ($228/AF) saved. LADWP's costs for wholesale water from the Metropolitan Water District of Southern California vary, but the base rate

[6] Mayer, P. W., & Deoreo, W. B. (Eds.). (1999). *Residential end uses of water*. American Water Works Assoc.
[7] 2012-05-31 Energy Conservation Program: Energy Conservation Standards for Residential Clothes Washers; Direct final rule: http://www.regulations.gov/#!documentDetail;D=EERE-2008-BT-STD-0019-0041
[8] Alliance for Water Efficiency. (2008). Transforming Water: Water Efficiency as Stimulus and Long-Term Investment. http://www.a4we.org/uploadedFiles/News/NewsArticles/NewsArticleResources/Water%20Efficiency%20as%20Stimulus%20and%20Long%20Term%20Investment%20REVISED%20FINAL%202008-12-18.pdf

reported in its 2010 *Urban Water Management Plan* was $1,485/MG (USD) ($484/AF) for untreated water.[9] The LADWP 2010 *Urban Water Management Plan* also includes estimates of costs for other sources of supply, alternative sources, and conservation. Those values are displayed in Table 2.

Table 2: LADWP estimated unit costs (USD) of various sources of supply and conservation from the 2010 UWMP

	Cost Per AF	Cost Per MG
Los Angeles Aqueduct	$563	$1,728
Groundwater	$215	$660
Metropolitan Water District	$527 - $869	$1,617 - $2,667
Conservation	$75 - $900	$230 - $2,762
Recycled Water	$600 - $1,500	$1,841 - $4,603
Water Transfer	$440 - $540	$1,350 - $1,657
Stormwater Recapture		
Centralized	$60 - $300	$184 - $921
Distributed		
Urban Runoff Plants	$4,044	$12,411
Rain Barrels	$278 - $2,778	$853 - $8,525
Cisterns	$2,426	$7,445
Rain Gardens	$149 - $1,781	$457 - $5,466
Neighborhood Recharge	$3,351	$10,284
Seawater Desalination	$1,300 - $2,000	$3,990 - $6138

The Alliance for Water Efficiency recently published an article that spotlights how demand reductions in Westminster, Colorado helped keep water rates down due to avoided infrastructure expansion. The findings counter a common argument against water conservation and efficiency as a culprit of rate increases due to lower water sales. Per capita water use decreased by 21 percent in Westminster, CO from 1980 to 2010. It was estimated that without this decrease Westminster, CO would have been required to secure an additional 2,380 MG (7,300 AF) of additional water supply to meet customer demand. The cost of the new supply expansion was calculated to be $92,100 (USD)/MG ($30,000/AF). The authors estimate that current combined water and wastewater rates would be 91 percent higher without the 21 percent decrease in per capita demand.[10]

Long-term demand reduction strategies come in a variety of options and target different sectors. Table 3 lists common water efficiency practices, fixtures that may be replaced or retrofitted to improve water use efficiency, and example sectors. Table 4 includes a sample of current programs being implemented by various water providers in the United States and Australia. Conservation pricing and policies such as ordinances (other than watering restrictions) and plumbing codes are not included in Table 3 or Table 4, but can be effective initiatives. Table 4 represents current efficiency programs and initiatives that are listed on water providers' websites, and does not reflect past or future efforts.

[9] Los Angeles Department of Water and Power. (2010). Urban Water Management Plan. http://www.water.ca.gov/urbanwatermanagement/2010uwmps/Los%20Angeles%20Department%20of%20Water%20and%20Power/LADWP%20UWMP_2010_LowRes.pdf

[10] Alliance for Water Efficiency. (2013). Conservation Limits Rate Increases for a Colorado Utility: Demand Reductions Over 30 Years Have Dramatically Reduced Capital Costs. http://www.allianceforwaterefficiency.org/westminster.aspx

Table 3: Example water efficiency fixture replacements, practices, and targeted sectors

Residential Indoor	Commercial and Industrial Indoor	Commercial and Industrial Indoor Continued	Example Commercial and Industrial Sectors	Outdoor
Surveys	Audits	Waterless Woks	Schools and Institutions	Surveys
Toilets	Toilets	Wet Cleaning Devices	Government Buildings	Irrigation Smart Controllers
Clothes Washers	Faucets	Cooling Towers	Office Buildings	Smart Water Application Technology (SWAT) Initiative
Showerheads	Urinals	Boilers and Water Heating	Food Service	Irrigation Heads
Faucets	Commercial Laundry Facilities	Humidifiers	Supermarkets	Rainfall Shutoff Device
Dishwashers	Laundromats and Common Area Laundry Facilities	Medical and Health Care Systems	Industrial Processes	Soil Moisture Sensors
Leak Detection and Repair	Ice Cream Machines	Steam Sterilizers & Autoclaves	Hospitals and Healthcare	Irrigation System Leak Detection and Repair
Hot Water Distribution Systems	Ice Machines	Swimming Pools and Spas	Vehicle Washing Facilities	Turf Replacement
Evaporative Cooling	Dipper Wells	X-ray Film Processors	Golf Courses	Landscape Design
	Combination Ovens	Package Graywater Recovery and Treatment Systems		Xeriscape
	Dishwashing	Alternate On-Site Water Sources		Natural Landscaping and Native Plants
	Food Steamers	Process Water Efficiency Improvements		Watering Restrictions
	Pre-rinse Spray Valves			Swimming Pools and Spas
				Water Features
				Water Brooms

Table 4: Example current long-term demand reduction strategies for various water providers

Seattle PUC and Saving Water Partnership	EBMUD	LADWP	SAWS	Tampa, FL	Cary, NC	New York, NY	Santa Fe, NM	Sydney, Australia	Victoria, Australia DEPI	Victoria, Australia DEPI (state level)	City West Water, Australia	Perth Water Corporation, Australia
Residential Toilet Rebates	WaterSmart Tips	Turf Replacement	WaterSaver Plant List	Build Your Own Rebate	High-Efficiency Toilets	Toilet Replacement Program	High-efficiency Clothes Washers	Education	Clothes Washers	Shower Timers/Shut-off Valves	Dual Flush toilet	Water Saving Tips
Free Toilets for Low-Income Housing	Commercial Conservation Rebates and Services	Clothes Washer Rebates	WaterSaver Home Checkup	Home Improvement Education Scholarships	Rain Barrel	Upstate Water Conservation Program	High-efficiency Toilets	Toilets	Swimming Pool Covers	Permanent Greywater Treatment Systems	Washing Machine	WaterWise Specialists
Leak Fixing Education	Water Conservation Publications and Resources	Rain Barrels	Irrigation Design Rebate	Free Plumbing Retrofit Kits	Irrigation Consultation	Water Reuse Program	Water Free Urinals	Water Fix Program	Rainwater Tanks Connected to Toilet or Laundry	Toilet Flush Valve	Pool Cover	H2O Assist Program. Not rebates. Assists in purchase and installation of:
School Education Programs	Home Surveys	Soil Moisture Sensors	Conservation Ordinance	Free Pre-Rinse Spray Valves	Beat the Peak - Pledge	Education	Commercial Process Efficiency	Water Saving Kit	Water Efficient Showerheads	Water Data Loggers	Showerhead	
Local Case Studies	High-Efficiency Toilet Rebates	WBICs	Residential Toilet Rebate	Put a Lid on Leaks	School Education		Rainwater Harvesting	Rainwater Tank	Dual Flush Toilets	Flow-control Devices	Permanent Greywater System	Dual Flush Toilets
Information on Rainwater Harvesting	High-Efficiency Clothes Washer Rebates	Rotating Nozzles	Free Water-Efficient Fixtures	Rain Barrel Workshops	Block Leader Program		Education	Hot Water Circulator	Water Reuse Systems	Hot Water Recirculators	Rainwater Tanks (connected to toilet and/or laundry)	Rainwater Tanks
Outdoor water use education and guidance	Lawn Conversion & Irrigation Upgrade Rebates	High-Efficiency Toilets	Leak Fixing Education	Rain Sensors	AquaStar Program		Rebates for HOAs and Condo Boards		Rainwater Tanks	Pool Covers with Roller/Reel for Covering	Water Conservation Audit	Pool Covers
Compost Calculator	Multi-Family Submeter Retrofit Incentives	Many Energy Related Rebates	Commercial Custom Rebate	Water Use Efficiency Survey					CII Rebates:	Automatic Rainwater Tank to Mains-water Switching System	Hot Water Recirculator Device	Automatic Irrigation Controllers
Watering Index	Graywater Systems	CII Custom Performance Program	Commercial Toilet Rebate Program						Rainwater Tanks Connected to Toilet, Laundry or Other Process	Laundry Systems Using Ozone Technology	Water Saving Tips	Re-programming of Irrigation Controllers
Water Budget Calculator	Mulch Discount Coupons	CII Custom Water Projects	WaterSaver Rain Sensor Coupon						Dual-flush Toilets	Condensate Recovery Systems	Water Saving Heroes	
Sprinkler Calculator	Free Water-Saving Devices (showerheads, faucets)	Free Water Conservation Items	Certified WaterSaver Program: Restaurants						Pre-rinse Nozzles	Hand-held Rinse Sprays		
		Savings Tips	Commercial Irrigation Design Rebate						Water-efficient Washing Machines	Process Water Reuse		
		Small Business Direct Install	Commercial Cooling Tower Audit						Commercial Glass Washers	Water-efficient Combi Steamers		
			Certified WaterSaver Program: Car Washes						Water-efficient Dishwashers			
			Power Washing Program						Waterless Wok Stove			
			Irrigation Checkup						Commercial High-pressure Water Cleaners			
			Drought-Tolerant Grass Varieties						Waterless or Low-flow Urinals			

Short-Term Curtailment

When drought occurs, immediate action must be taken to reduce the demand for water. This action is often referred to as "short-term curtailment" because it is implemented on a temporary basis, and is typically composed of water use restrictions. Planning for drought in advance is essential. Contingency planning before a shortage allows selection of appropriate responses consistent with the varying levels of severity. Most water providers create increasingly restrictive actions for progressive stages of drought. Public outreach and education are a critical component of this process.

The 2011 *M60 Drought Preparedness and Response Manual* from the American Water Works Association identifies seven crucial steps for drought preparedness and response. These steps are:

1. Form a water shortage response team.
2. Forecast supply in relation to demand.
3. Balance supply and demand and assess mitigation options.
4. Establish triggering levels.
5. Develop a staged demand reduction plan.
6. Adopt the plan.
7. Implement the plan.

The AWWA *M60 Drought Preparedness and Response Manual* is an excellent resource to help water providers prepare for drought. The M60 Manual was prepared over several years by a dedicated group of water supply and demand management experts and includes a number of useful examples of recent utility drought response efforts.

Short-term curtailment strategies will vary depending on the severity of the shortage, but may include the following:

- Public outreach and education.
- Customer behavior changes.
- Shut-off valve requirements for all hoses.
- Landscape watering restrictions (assigned days and times; severity depends on level of shortage).
- Water budgets or drought water allocations.
- Drought surcharges and other pricing strategies.
- Temporary ban on new customer connections.
- Vehicle washing prohibitions.
- Sidewalk, driveway, and other hard surface washing prohibitions.
- Water only upon request at restaurants.
- Pool cover requirements.
- Police enforcement of, and citations for, water waste or failure to adhere to restrictions.

Some of these practices have become part of daily operations, even when weather patterns and water supplies are at normal levels. For example, many service areas have some kind of water use restrictions permanently in place. What makes this particularly poignant are the existence of permanent outdoor water use restrictions in Midwest communities such as Buffalo Grove, IL, Aurora, IL, and Northville Township, MI.[11] All of these communities have an average annual rainfall over 30 inches.[12]

There has been concern about the potential for diminishing effectiveness of short-term curtailment strategies due to the implementation of permanent restrictions and the success of long-term water efficiency efforts. This phenomenon has been dubbed "demand hardening" and is discussed in the next section.

[11] Buffalo Grove, IL - http://www.vbg.org/index.aspx?NID=414
Aurora, IL - http://www.aurora-il.org/development_services/publicworks/waterproduction/conservation.php
Northville Township, MI - http://www.northvillemich.com/index.aspx?page=84

[12] National Oceanic and Atmospheric Administration's National Climate Data Center. (2013). 30 Year Average. http://www.ncdc.noaa.gov/

Demand Hardening

It has been argued that long-term water efficiency efforts make it more challenging to respond during water shortages and thus "harden demand." This section identifies discussion of demand hardening in the literature and contains examples of the terminology being used by water providers in planning documents. The first documented use of the term "demand hardening" was found in a 1994 California Urban Water Agencies (CUWA) paper based on interviews with 12 water professionals. In it, they offer the following definition: "The diminished ability or willingness of a customer to reduce demand during a supply shortage as the result of having implemented long-term conservation measures (pg. 11)."[13]

CUWA's report noted, "Most agencies felt that the positive benefits of long-term conservation far outweighed the option of doing nothing. Others did not see significant demand hardening arising out of long-term conservation." Additionally, others stated, "Long-term conservation is a given and an important component in many agencies' long-term planning. It will greatly improve overall supply reliability (pg. 12)."

The Journal of the American Water Works Association published an article by William DeOreo in 2006 titled, *The Role of Water Conservation in a Long-range Drought Plan.* The paper concluded that it is a good strategy to have water conservation measures in place well before a supply shortage occurs.[14] Howe and Goemans (2007) say, "...to ignore long-term conservation benefits and to build excess water supply capacity simply to facilitate cutbacks during drought can be highly uneconomic, akin to overfeeding people so that dieting will be easier (pg. 25)."

There is evidence of water providers acknowledging demand hardening in plans. In the 2011 Hampton Roads, Virginia Planning District Commission's *Regional Water Supply Plan* demand hardening is recognized, as is the importance of water conservation.

> "Future improvement in lowering per capita usage will be more difficult because of water demand hardening. Demand hardening occurs as the discretionary use of water diminishes, leaving only necessary water use; which is more difficult to reduce. While water conservation may be difficult in the future, it remains a priority for Hampton Roads (pg. 5-18)."[15]

Denver Water's 2011 *Drought Response Plan* conceptualizes the idea of demand hardening in a unique way. The below text is quoted from the plan and fundamentally states that water saved through Denver Water's conservation program will be used to both supply future growth, and to strengthen water supply reserves.

[13] Tabors Caramanis & Associates. (1994). Long-term Water Conservation and Shortage Management Practices: Planning That Includes Demand Hardening. *Report to the California Urban Water Agencies.*
[14] DeOreo, W. B. (2006). The role of water conservation in a long-range drought plan. *Journal-American Water Works Association, 98*(2).
[15] Hampton Roads Planning District Commission. (July 2011). Regional Water Supply Plan. http://www.hrpdcva.gov/uploads/docs/FINAL_HR%20RWSP_Jul2011_Report_only.pdf

"...there is an obvious interaction between the demand reductions that occur from water use restrictions in a drought and long-term water conservation. Though the current realities of the interaction are really quite complex, generally, as Denver Water's customers become more efficient, it is more difficult for them to reduce their usage in a drought, than when they were less efficient. This is not to say that Denver Water encourages its customers to remain inefficient so that greater savings can be attained with restrictions in a drought. Rather, the interrelationship of savings in a drought with long-term conservation implies careful consideration of how best to use the savings from conservations [sic], including whether they should be used to supply water for new population growth or reserved within the water system as buffer against severe drought and other future risks.

In the 2007 Supplement to the Board's Resource Statement, the Board reinforced its commitment to a diverse portfolio of resources to serve future need and to minimize risks, including the risk of severe drought restrictions. For the near-term, the Board determined that water conserved under the enhanced conservation program will be used to fortify the Strategic Water Reserve which is the buffer against future uncertainties including the risk of severe drought. This has the ancillary environmental benefit of more water in streams and reservoirs for a period of time. Therefore the Board chose to use a portion of the saving from conservation to supply future demand growth and reserved a portion as a buffer against future risks including severe drought (pg. 10 of Technical Appendices)."[16]

The Los Angeles Department of Water and Power notes in its 2010 *Urban Water Management Plan* that price elasticities were reduced in one of its demand forecasting models to avoid double counting conservation. That is, they assumed water demand will respond less to price signals due to established gains in efficiency. Below are related quotes from the *LADWP Urban Water Management Plan*.

"The price elasticities reflect a reduction of approximately 1/3 from those tabulated in MWD's 2010 IRP. However, MWD's 2010 IRP Appendix A.1 states that consumers respond to price increase by installing water-conserving fixtures and appliances. As more water efficient fixtures are installed, the impact of changing water using behavior through rates is reduced. This is known as "demand hardening." Reducing price elasticity is done to avoid double-counting conservation savings and to account for demand hardening (pg. 44)."

"... it can be argued that hardware based conservation devices will continue to be developed, piloted and implemented, such as the previously discussed weather based irrigation controllers, thus improving the ability to further conserve in the future. During droughts, consumers will respond to the call for more conservation by behaviorally adjusting their water use through methods such as not leaving water running and taking shorter showers. Additionally, full saturation of current conservation devices has not occurred. For these reasons, others believe demand hardening is irrelevant and there is a continued need for aggressive conservation programs."

...

"As a worst case scenario, demand hardening and its effects are considered in LADWP's water demand forecasts to ensure that the appropriate supply of water is planned for. However, LADWP will continue to maintain its aggressive water conservation program discussed within this section (pg. 75)."

A thorough search revealed acknowledgment and discussion of demand hardening, but there are no documented cases of water providers being unable to make the necessary demand reductions during a

[16] Denver Water. (December 2011). Drought Response Plan.
http://cwcbweblink.state.co.us/WebLink/ElectronicFile.aspx?docid=157757&&&&dbid=0

drought due to previously implemented long-term water efficiency measures. While past improvements in efficiency might make it more challenging to curtail water use during a shortage, efficiency may ultimately make supply more reliable by requiring less water for nondiscretionary uses. More empirical research is needed to fully understand the potential implications of demand hardening. The term may well prove to be a red herring, but deeper analysis of the concept in relation to real world supply and demand scenarios could help strengthen water providers' understanding of, and ability to predict, curtailment potential during water shortages.

Past Drought Response Strategies in the United States

A search was conducted to identify examples of drought response in the United States that include documented estimates of savings. Examples of savings achieved via water use restrictions and other drought strategies help water providers in planning for drought, as they demonstrate what has been achieved in the past. There are examples from Raleigh, North Carolina, Birmingham, Alabama, the Front Range of Colorado, the East Bay Municipal Utility District in Oakland, California, and Austin, Texas. Recent state level efforts in California are also included.

Raleigh, North Carolina

In 2007 North Carolina faced its worst drought in recorded history. In October of that year the City of Raleigh reportedly banned lawn irrigation due to lingering drought conditions. This was in addition to the previously implemented Stage 1 restrictions. Stage 1 restrictions alone caused an 18 percent drop in water demand from 65.4 MGD to 54.17 MGD. Violators of the restrictions received a $200 (USD) fine for the first offense, a $1,000 fine for the second offense, and a third violation could have resulted in an interruption of water service. During the first seven weeks of the restrictions 299 first-time citations and 11 second-time citations were issued.[17]

Birmingham, Alabama

In June 2007 Birmingham Water Works initiated Stage 3 drought restrictions that included a drought surcharge. Residential customers that exceeded 8,977 gallons per month incurred a surcharge of 200 percent in addition to the regular water rate. According to the June 6, 2007 Birmingham Water Works press release regarding the surcharge, the average residential customer used 7,500 gallons per month in 2007.[18] Birmingham Water Works reportedly saw a decrease in water consumption from 114 to 95 MGD, a 17 percent reduction.[19] In addition to the surcharge the Birmingham Stage 3 restrictions include the following:

- "Customers will be allowed to water established lawns and landscaping one day per week using irrigation systems for no more than a total of one hour.
- Customers without irrigation systems will be allowed to hand water using a hose with a nozzle two days per week.
- New lawns and landscaping exempt from day of the week watering restrictions for the first 20 days after installation.
- Athletic fields may be watered Wednesdays and Saturdays between 4 a.m. and 9 a.m. when determined that said fields are hazardous to the health and safety of children and athletes, by being too hard by virtue of a lack of water.
- Golf courses to restrict watering to tees and greens only on Mondays, Wednesdays and Fridays between the hours of 1 a.m. and 5 a.m.
- Exemptions made for select commercial outdoor water users."[20]

[17] Town of Wake Forest, NC. (Accessed December 2013). Year-Round Lawn Irrigation Water Conservation Measures. http://www.wakeforestnc.gov/waterconservation.aspx

[18] Birmingham Water Works. (2007). Stage Three - "Drought Warning" Birmingham Water Works to implement surcharges for excessive use.http://www.birminghamwaterworks.com/index.php?option=com_content&task=view&id=43&Itemid=88

[19] Manuel, John. 2008. Drought in the Southeast: Lessons for Water Management. Environ Health Perspect 116(4): A168–A171. http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2291006/

[20] Birmingham Water Works Drought Management Plan Summary. (Accessed December 2013). http://www.bwwb.org/sites/default/files/docs/doc-dmpsummary.pdf

Colorado Front Range

In 2002 communities along Colorado's Front Range were challenged by drought conditions. The drought response strategies implemented by eight of these communities were analyzed in 2004 by Kenney et al. In the review, the research team identified savings levels based on a variety of strategies ranging from voluntary measures to strict mandatory restrictions.

Of the eight communities, four limited lawn watering to once every three days (2.3 times per week), three limited lawn watering to two times per week, and one community limited lawn watering to one day per week. One of the communities with every three-day lawn watering restrictions was on a voluntary basis. The three communities with mandatory 'once every three-day' lawn watering restrictions reduced per capita water use by an average of 17 percent, the three communities with mandatory 'two times per week' restrictions reduced per capita water use by 31 percent, and the one community with a 'one time per week' lawn watering restriction reduced per capita water use by 55 percent.[21]

The article also noted a concern shared by some of the water providers, "...several managers expressed concern that some customers may feel obligated to water on their designated days even if rains had recently occurred or were forecast, thereby reducing the potential savings from this form of water restrictions (pg. 86)."[21]

During the drought of 2002 Aurora, Colorado employed a variety of strategies including water use restrictions, a public education campaign, fixture rebates and other long-term efficiency strategies, and changes in water pricing. The efforts resulted in a 26 percent reduction in total demand in 2003.[22] The team researching this noted that pricing strategies and restrictions do not work independently of one another. Specifically, they concluded that while restrictions are in place, an increase in price will produce less of a reduction in demand than if a price increase is implemented when restrictions are absent.[22] That is, customers who are already reducing water consumption via restrictions and other efforts will respond less to a price increase because they are already taking action. This is consistent with assumptions made in the previously referenced *2010 LADWP Urban Water Management Plan*. In Aurora, Colorado they estimated a price elasticity change from -0.60 without restrictions to -0.37 with restrictions. (An elasticity of -0.60 suggests that a 10 percent increase in the marginal price of water will result in a 6 percent reduction in demand. An elasticity of -0.37 suggests that a 10 percent increase in price will result in a 3.7% reduction in demand.) Additionally, they found that customers identified as high water users produced a larger shift, from -0.75 without restrictions to -0.24 when restrictions are in place.[22]

While the price elasticity of water demand is a complex subject, the findings from Aurora, Colorado indicate an important idea: that water use restrictions and changes in price do not function independently when they are in place concurrently. For example, if a water provider estimates a price elasticity of -0.60 and separately estimates that planned drought restrictions will result in a 6 percent reduction in water demand, a 12 percent reduction in demand should not be anticipated if both a 10 percent price increase and the restrictions are implemented. While they do not function independently, both appear to be effective strategies and can complement each other.

[21] Kenney, D. S., Klein, R. A., & Clark, M. P. (2004). Use and Effectiveness of Municipal Water Restrictions During Drought in Colorado. JAWRA Journal of the American Water Resources Association, 40(1), 77-87.

[22] Kenney, D., Goemans, C., Klein, B., Lowrey, J., Assessment, C. N. W. W., & Reidy, K. (2007). Residential water demand management in Aurora: learning from the drought crisis. Colorado Water, 14.

East Bay Municipal Utility District, CA

The East Bay Municipal Utility District (EBMUD) officially declared a drought in May 2008. The primary mechanism to reduce water consumption during the drought was a 10 percent increase in the volumetric water rate, and the creation of customer water allocations. Customers could request adjustments to their allocations. According to EBMUD, 90 percent of the 7,300 customers that requested an adjustment had their appeal honored. A surcharge of $2.00 (USD) was incurred for every hundred cubic feet consumed above the allocation. Other strategies included a recycled water truck program, local business visits, and distribution of water savings devices. EBMUD had a goal of a 15 percent water use reduction throughout the service area. By the end of September 2008 an 11.3 percent reduction had been achieved.[23, 24]

Austin, Texas

The City of Austin, Texas has aggressively pursued water efficiency in recent years and estimates that it saved over 8,500 MG (26,000 AF) of water from September 2010 through August 2011 due to a variety of water conservation efforts, including its Stage 1 water restrictions. Austin Water's Stage 1 restrictions allow watering two days per week. Residential customers with odd addresses can water on Wednesday and Saturday, residential customers with even addresses can water Thursday and Sunday, and commercial and multifamily customers can water on Tuesday and Friday. In addition, the Stage 1 restrictions have the following provisions:

- Irrigation systems can only be used before 5:00 a.m. or after 7:00 p.m.
- Hose-end sprinklers can only be used before 10:00 a.m. or after 7:00 p.m.
- Hand watering is allowed anytime on any day of the week.[25]

Austin currently has incentives for the following water efficiency programs listed on its website:

Table 5: Austin, Texas water efficiency incentives.
(http://austintexas.gov/department/water-conservation-rebates)

Rebates and Incentives for Residential Customers	Rebates and Incentives for Businesses
WaterWise Landscape Rebate	ICI Audit Rebate Pilot Program
Free Showerheads & Faucet Aerators	3C Business Challenge
Pressure Regulating Valve (PRV) Rebate	Washwise Rebate Program
Rainwater Harvesting Rebate	Rainwater Harvesting Rebates
Irrigation System Evaluations & Rebates	Commercial Process Rebates
Drought Survival Tools: Soil Moisture Meters, Treegators, and Hose Meters	Multi-Family Pressure Regulating Valve (PRV)
Watering Timer Rebate Pilot Program	Alternative Irrigation Compliance Pilot Program
Pool Cover Rebate	

[23] East Bay Municipal Utility District. (December 4, 2008). A Case Study of Water Management During a Drought https://www.watereducation.org/userfiles/09ExecutiveBriefingEileenWhite.pdf
[24] East Bay Municipal Utility District. (October 2, 2008). Nearly five months since declaring a drought emergency EBMUD's aggressive effort to meet water savings goal shows positive results. https://www.ebmud.com/sites/default/files/pdfs/Drought%20Status%20Press%20Release.pdf
[25] The City of Austin, Texas. (Accessed January 2014). Stage 1 Watering Restrictions. http://www.austintexas.gov/department/stage-1-watering-restrictions

The City also estimated water savings from Stage 2 restrictions from 2009 through March 2013 to be more than 8,150 MG (25,000 AF). It also estimated that an additional 1,300 MG (4,000 AF) were saved from March through July in 2013 from Stage 2 restrictions. Austin was in Stage 2 restrictions for four months in 2009 and for 21 of the 23 months leading up to July 2013. Revenue loss resulting from Stage 2 restrictions enforced from 2009 through March 2013 was estimated to be $47.1 million (USD). From 2009 to July 2013 the City issued more than 4,600 warnings and more than 7,700 citations. Citations were prosecuted through municipal court and carried a fine of $475 (USD) per violation. Citations are now issued via customer bills.[26] Austin's Stage 2 water restrictions are below:

Austin Water Stage 2 Water Restrictions

- "Your assigned watering day is determined by property type, type of irrigation used, and whether the street address ends in an even or odd number.
- Hose-end irrigation may take place between midnight and 10 a.m. and between 7 p.m. and midnight on your assigned watering day.
- Automatic irrigation systems may operate between midnight and 5 a.m. and between 7 p.m. and midnight on your watering day.
  - Please reduce system run times to fit within this schedule.
  - Please ensure that your system has a working rain sensor, or operate the system manually when rain is forecasted.
- Watering with a hand-held hose or a refillable watering vessel, such as a bucket or a Treegator®, is allowed at any time on any day of the week.
- Drip irrigation is exempt from the schedule, due to increased efficiency.
- To water trees, soaker hoses may be used under the drip-line of the tree canopy or you may use automatic tree bubblers. Irrigating trees in this manner is exempt from the watering schedule
- Watering a vegetable garden with a soaker hose is exempt from the watering schedule.
- Washing vehicles at home is prohibited. If you need to wash a vehicle, you may do so at a commercial carwash facility.
- Charity car washes are prohibited
- Fountains with either a fall or spray of water greater than four inches are prohibited unless necessary to preserve aquatic life.
- Restaurants may not serve water unless requested by a customer.
- Commercial properties (including restaurants and bars) may only operate patio misters between 4 p.m. and midnight."[27]

California

The end of 2013 marked the driest calendar year on record in California.[4] The state also experienced a severe drought from 2007-2009. During that time the state made several efforts related to urban water use:

- Creation of DWR drought website
- Scheduling of urban drought workshops
- Funding for water savings programs

[26] Austin Water Staff. (January 2014). Personal Communication.
[27] The City of Austin, Texas. (Accessed January 2014). Stage 2 Watering Restrictions. http://www.austintexas.gov/department/stage-2-watering-restrictions

- Funding for water recycling projects
- Funding for desalination research and development
- Financial assistance for drought programs
- Mandating water efficiency in all state-owned buildings
- Facilitating water transfers
- Establishment of a water bank
- Drought contingency planning as part of the California Water Plan process
- Technical assistance for small water systems and private well owners[28,29]

Documented cases of drought response in the United States demonstrate that short-term curtailment strategies, particularly outdoor water use restrictions, are largely successful. Surcharges and changes in rates are also approaches that can be used to encourage reductions in demand, and help maintain financial stability during a drought.

The Water Research Foundation's (WRF) *Drought Response Model* allows planners to analyze the impact of restrictions and changes in pricing on revenue, and represents a useful tool for planners. The Drought Response Model was created as part of WRF project 4175 - *A Balanced Approach to Water Conservation in Utility Planning* and is designed to, "simulate demand response and revenue effects of asking customers to reduce water use during a drought."

Regardless of which approaches are selected to curtail water use during a drought, communicating with customers is a crucial element. Below is an excerpt from Denver Water's *Drought Response Plan*.

> "The level of drought severity determines the level of communication efforts. If the drought is severe and requires the Board to impose mandatory drought restrictions, Denver Water's Public Affairs Division will employ aggressive public information tactics. Numerous tools are available for such efforts, including direct mail, Web updates, bill inserts, electronic newsletters, internal newsletters, social media, public meetings, Citizen Advisory Committee meetings, advertisements, press releases and media interviews (pg. 30)."[16]

A 2010 Water Research Foundation study that analyzed customer communications suggests that effective strategies should be broadly focused to reach a wide audience, and clearly articulate a goal such as a percentage reduction.[30] In the case of surcharges, the AWWA M1 Manual *Principles of water rates, fees, and charges* recommends a vigorous education campaign to achieve the desired reduction. An education campaign will help customers understand the reasoning for a surcharge and build acceptance.[31] The M1 Manual goes on to say the following about communication and education regarding surcharges:

[28] California Department of Water Resources. (2009). California's Drought: Water Conditions and Strategies to Reduce Impacts. http://www.water.ca.gov/news/newsreleases/2009/040209droughtrpt-gov.pdf
[29] California Department of Water Resources. (Accessed December 2013). Drought Timeline. http://www.water.ca.gov/watertransfers/docs/timeline-present.pdf
[30] Water Research Foundation. (2010) *Water Conservation: Customer Behavior and Effective Communications*- Project #4012.
[31] American Water Works Association. *Principles of water rates, fees, and charges*. American Water Works Association, 2012.

> "Working with the media during a drought is critical to providing information to customers about the severity of the drought, desired customer responses, and the need, purpose, and implications of drought pricing strategies.
> ...
> It should also explain that drought surcharges are one tool in a set of measures that the utility is using to engage the community in effective water resource management (pg. 185)."[28]

To gain additional insight about drought response, the next section reviews the Australian Millennium Drought.

Australia's Millennium Drought

From 1997 to 2009 southeast Australia experienced its worst drought on record, and it is often referred to as the Millennium Drought.[32] The Millennium Drought parched the Australian landscape which impacted ecosystems, caused massive agricultural losses, gave rise to brushfires in catchment and other areas, and severely challenged water providers to deliver water to customers. Researchers say two thirds of the rainfall deficit in east Australia during that time can be explained by El Niño activity.[33] The drought ended in late 2010 with very high precipitation and flooding in southeast Australia due to La Niña activity. Southwestern Australia, however, experienced its driest year on record in 2010 as it is unaffected by La Niña activity.[33]

According to the Australian Commonwealth Scientific and Industrial Research Organisation (CSIRO), average annual rainfall from 1997 through 2009 was 12 percent lower than the average annual rainfall from 1900 through 2010.[33] A CSIRO presentation reported that precipitation trends in southeast Australia from 2001 to 2010 were as follows:

2001 - 7 percent below average
2002 - 26 percent below average
2003 - 4 percent below average
2004 - 12 percent below average
2005 - about average
2006 - 40 percent below average
2007 - 6 percent below average
2008 - 18 percent below average
2009 - 13 percent below average
2010 - 32 percent above average[34]

How did the federal government, state governments, and water providers respond to the Millennium Drought? To help answer this question activities at the federal level are discussed, as are efforts in Victoria (state level), Melbourne (a city in Victoria), and Perth, Western Australia. Existing drought restrictions are also included for the state of Victoria. A very detailed account of Australian drought restrictions through 2007 can be found in the Institute for Sustainable Futures' *Review of Restrictions* document.[35]

[32] CSIRO (2012). Climate and water availability in south-eastern Australia: A synthesis of findings from Phase 2 of the South Eastern Australian Climate Initiative (SEACI), CSIRO, Australia, September 2012, 41 pp, www.seaci.org/publications/documents/SEACI-2Reports/SEACI_Phase2_SynthesisReport.pdf.

[33] Dijk, Albert IJM, Hylke E. Beck, Russell S. Crosbie, Richard AM Jeu, Yi Y. Liu, Geoff M. Podger, Bertrand Timbal, and Neil R. Viney. (2013). The Millennium Drought in southeast Australia (2001–2009): Natural and human causes and implications for water resources, ecosystems, economy, and society. Water Resources Research.

[34] Dijk, Albert and Sardella, Carolina. (April 2012) The Millennium Drought in Australia. Australian Commonwealth Scientific and Industrial Research Organisation Presentation.
http://www.clivar.org/sites/default/files/VanDijk.pdf

[35] Institute for Sustainable Futures. (2009). Review of Restrictions Volume 1 – Review and Analysis
http://www.nwc.gov.au/__data/assets/pdf_file/0019/11755/Water_restrictions_Volume_1.pdf

Australian Federal Government Response

The Australian Constitution gives the right to manage water to the states.

> Section 100: "The Commonwealth shall not, by any law or regulation of trade or commerce, abridge the right of a State or of the residents therein to the reasonable use of the waters of rivers for conservation or irrigation."[36]

However, action was taken during the Millennium Drought to increase federal involvement, and in 2004 the National Water Initiative (NWI) was agreed upon by the Council of Australian Governments (COAG). The National Water Initiative is a national blueprint for water reform that includes water efficiency as a top priority. In accordance with the NWI the COAG has agreed to prepare water plans, achieve efficient water use, create registers of water rights and water accounting standards, expand water trading, improve management of urban demands and improve pricing for water storage and delivery.[37] Beyond spearheading the NWI, the Australian federal government also provided billions of dollars of funding in response to the Millennium Drought, and in 2008 created the $12.9 billion (AUD) Water for the Future Plan.[38] The National Water Commission is charged with overseeing state progress with the NWI and in 2011 released a National Planning Report Card that reported on jurisdictional progress in the water planning process.[39]

Water markets are also part of the Australia National Government's efforts. The water market allows the buying and selling of water from various water systems and political boundaries. According to the Australian government this ensures water is allocated to the highest value use during a shortage.[40] The federal government assists in water accounting and the creation of water registers to help facilitate water market activities.[41] The water market puts a cap on the amount of water that can be extracted for consumptive use and apportions water for the environment. Once the consumptive pool is determined, each specific use is assigned a limit. Water can then be reallocated among water right holders through trades.[42]

State of Victoria, Australia

The Department of Environment and Primary Industries (DEPI) manages water resources in the state of Victoria, Australia. The agency offers water efficiency rebates, provides education and technical assistance, develops state-wide uniform guidelines for local water corporations to enforce permanent water saving rules and water restrictions, and facilitates water trading. The DEPI is also pushing for advances in the state's use of rainwater, stormwater, and wastewater in its *Living Victoria Policy*.[43] To

[36] Section 100 of the Australian Constitution. (Accessed November 2013). http://www.aph.gov.au/About_Parliament/Senate/Powers_practice_n_procedures/~/link.aspx?_id=63B954D0FFB44EC78FC18B10C53EBCCE&_z=z

[37] Australian Government Department of Environment. (Accessed December 2013). National Water Initiative. http://www.environment.gov.au/topics/water/australian-government-water-leadership/national-water-initiative

[38] Australia National Water Commission. (2010). Administration of the Water Smart Australia Program. http://www.anao.gov.au/~/media/Uploads/Documents/2009%2010_audit_report_21.pdf

[39] Australia National Water Commission. (2011). National Water Planning Report Card. http://archive.nwc.gov.au/library/topic/planning/national-water-planning-report-card-2011

[40] Australian National Government. (2012). Water Market. http://www.nationalwatermarket.gov.au/

[41] Australian Government. (2013). The National Water Market System Project. http://www.nationalwatermarket.gov.au/site-information/index.html

[42] Australia National Water Commission. (2011). Water Markets in Australia: A Short History. http://www.nwc.gov.au/__data/assets/pdf_file/0004/18958/Water-markets-in-Australia-a-short-history.pdf

[43] Victoria, Australia Department of Environment and Primary Industries. (2013). http://www.depi.vic.gov.au/water

help provide supply reliability the Victorian government built a seawater desalination plant capable of supplying 150 billion litres (40 billion gallons) of water per year at a cost of $5.7 billion (AUD). Due to the recovery of storage volumes following the Millennium Drought, the desalination plant is not currently providing water to the Melbourne supply system.[44,45]

Table 6 (next page) lists Victoria, Australia's four stages of drought restrictions. Due to the large amount of information presented in the table it required small print and if hard to read, a link is included that goes directly to the corresponding website. The state also has permanent water use rules that require hoses to be leak free with use of a trigger nozzle at all times, rules for residential, commercial, and public lawns and gardens, fountains and water features, and cleaning of hard surfaces.

[44] Victorian Desalination Plant. (Accessed December 2013). Victoria Department of Treasury and Finance. http://www.dtf.vic.gov.au/Infrastructure-Delivery/Public-private-partnerships/Projects/Victorian-Desalination-Plant

[45] Melbourne Water (Accessed January 2014). Desalination. http://www.melbournewater.com.au/whatwedo/supply-water/Pages/Desalination.aspx

Table 6: The state government of Victoria drought restrictions
(http://www.depi.vic.gov.au/water/saving-water/water-restrictions)

	Permanent Water Rules	Stage 1	Stage 2	Stage 3	Stage 4
Hand-held hose	Water from a hand-held hose must not be used for any purpose (whether or not the use is subject to a permanent water saving rule) at any time unless the hose: is fitted with a trigger nozzle is leak-free.				
Residential and commercial gardens and lawns	A residential or commercial garden or lawn cannot be watered except: with a hand-held hose, bucket or watering can at any time; with a watering system between the hours of 6 pm – 10 am on any day.				Residential or commercial gardens and lawns cannot be watered at any time.
Hand watering		You can water residential or commercial gardens and lawns at any time, on any day using a hand-held hose fitted with a trigger nozzle.	You can water residential or commercial gardens at any time, on any day using a hand-held hose fitted with a trigger nozzle.	You can water residential or commercial gardens on alternate days between 6 am – 8 am using a hand-held hose fitted with a trigger nozzle.	
Watering systems		You can water gardens and lawns using a watering system (manual, automatic, spray or dripper) only on alternate days between 6 am – 10 am and 6 pm – 10 pm.	You can water gardens using a watering system (manual, automatic, spray or dripper) only on alternate days between 6 am – 8 am and 6 pm – 8 pm.	You can only water gardens using a dripper watering system on alternate days between 6 am – 8 am.	
Public gardens, lawns and playing surfaces	A public garden or lawn area or a playing surface cannot be watered except: with a hand-held hose, bucket or watering can at any time; with a watering system fitted with a rain or soil moisture sensor between the hours of 6 pm – 10 am on any day; or in accordance with an approved Water Use Plan.				Public gardens, lawns and playing surfaces cannot be watered at any time.
Hand watering		You can water public gardens, lawns and playing surfaces at any time, on any day using a hand-held hose fitted with a trigger nozzle.	Public lawn areas cannot be watered at any time. You can water public gardens and playing surfaces at any time, on any day using a hand-held hose fitted with a trigger nozzle.	Public lawn areas cannot be watered at any time. You can water public gardens and playing surfaces on alternate days between 6 am – 8 am using a hand-held hose fitted with a trigger nozzle.	
Watering systems		Public gardens, lawns and playing surfaces can also use a watering system only on alternate days between 6 am -10 am and 6 pm – 10 pm or water in accordance with an approved Water Use Plan.	Public gardens and playing surfaces can also use a watering system only on alternate days between 6 am – 8 am and 6 pm – 8 pm or water in accordance with an approved Water Use Plan.	Public gardens and playing surfaces can also use a dripper watering system only on alternate days between 6 am – 8 am or water in accordance with an approved Water Use Plan.	
Fountains and water features	Water cannot be used in a fountain or a water feature unless the fountain or water feature recirculates the water.	You can fill and operate your fountain or water feature as long as it recirculates the water.	Water cannot be used to fill or top up a fountain or water feature at any time.	Water cannot be used to fill or top up a fountain or water feature at any time.	Fountain or water features cannot be filled or topped up at any time.
Hosing down of hard surfaces	Water cannot be used to clean hard surfaces (including, driveways, paths, concrete, tiles, timber decking) except: where cleaning is required as a result of an accident, fire, health hazard, safety hazard or other emergency; if staining to the surface has developed, and then only once a season; in the course of construction or renovation, and then only by means of: a high pressure water cleaning device, or if such a device is not available, a hand-held hose or a bucket.	You cannot hose down hard surfaces including driveways, paths, concrete, tiles, timber decking and other paved areas except where cleaning is required as a result of an accident, fire, health hazard, safety hazard or other emergency. You can use a high-pressure cleaning unit, or if such a unit is not available, a hose fitted with a trigger nozzle, or a bucket in the course of construction or renovation.	You cannot hose down hard surfaces including driveways, paths, concrete, tiles, timber decking and other paved areas except where cleaning is required as a result of an accident, fire, health hazard, safety hazard or other emergency. You can use a high-pressure cleaning unit, or if such a unit is not available, a hose fitted with a trigger nozzle, or a bucket in the course of construction or renovation.	You cannot hose down hard surfaces including driveways, paths, concrete, tiles, timber decking and other paved areas except where cleaning is required as a result of an accident, fire, health hazard, safety hazard or other emergency. You can use a high-pressure cleaning unit, or if such a unit is not available, a hose fitted with a trigger nozzle, or a bucket in the course of construction or renovation.	You cannot hose down hard surfaces including driveways, paths, concrete, tiles, timber decking and other paved areas except where cleaning is required as a result of an accident, fire, health hazard, safety hazard or other emergency. You can use a high-pressure cleaning unit, or if such a unit is not available, a hose fitted with a trigger nozzle, or a bucket in the course of construction or renovation.

(continued on next page)

Vehicle washing		You can wash your car, boat or other vehicle at home using a high-pressure cleaning unit, a hand held hose fitted with a trigger nozzle or a bucket or watering can, at any time, any day of the week; or at a commercial car wash.	You can wash your car, boat or other vehicle at home using a high-pressure cleaning unit, a hand-held hose fitted with a trigger nozzle or a bucket or watering can, at any time, any day of the week; or at a commercial car wash.	You can wash the windows, mirrors, lights, registration plates and for spot removing corrosive substances of your car, boat or other vehicle at home using a bucket or watering can; or at a commercial car wash, and only where cleaning is required for health and safety reasons, safety hazard or other emergency.	You can wash the windows, mirrors, lights, registration plates and for spot removing corrosive substances of your car, boat or other vehicle at home; or at a commercial car wash, using a bucket or watering can, and only where cleaning is required for health and safety reasons, safety hazard or other emergency.
Sporting grounds		Councils and schools can water sportsgrounds and gardens in accordance with the times under Stage 1 restrictions or submit a Water Use Plan to efficiently water outside of the prescribed hours.		Councils and schools can water sportsgrounds and gardens in accordance with the times under Stage 3 restrictions or submit a Water Use Plan to efficiently water outside of the prescribed hours.	Councils and schools cannot water sporting grounds and gardens at any time.
Pools, spas and water toys					
Filling		A new pool or spa of up to 2,000 litres can be filled by means of a hand-held hose, bucket or watering can or an automatic water top up device. However, a new or existing pool or spa of greater than 2,000 litres can only be filled in accordance with a Water Use Plan. Contact your local water corporation for more information.	A new pool or spa of up to 2,000 litres can be filled by means of a hand-held hose, bucket or watering can or an automatic water top-up device. However, a new or existing pool or spa of greater than 2,000 litres can only be filled in accordance with a Water Use Plan. Contact your local water corporation for more information.	A new or existing pool or spa of any capacity cannot be filled. However, new or existing public pools or spas of any capacity can be filled in accordance with a Water Use Plan. Contact your local water corporation for more information.	A new or existing pool or spa of any capacity cannot be filled.
Topping up		An existing pool or spa of any size can be topped up using an automatic top-up device or a hand held hose, bucket or watering can. A mobile spa can only be filled or topped up in accordance with a Water Use Plan.	A new or existing pool or spa of any size can be topped up only on alternate days between 6 am – 8 am and 6 pm – 8 pm using a hand-held hose, bucket or watering can; or by using an automatic water top-up device at any time. Pools and spas can also be topped up at any time in accordance with an approved Water Use Plan. A mobile spa can only be filled or topped up in accordance with a Water Use Plan.	Only existing residential or commercial pools or spas of any size can be topped up on alternate days between 6 am – 8 am using a hand-held hose, bucket or watering can; or by using an automatic water top up device. Pools and spas can also be topped up at any time in accordance with an approved Water Use Plan. A mobile spa can only be filled or topped up in accordance with a Water Use Plan.	New or existing pools or spas can only be topped up using a bucket or watering can. A mobile spa can only be filled or topped up in accordance with a Water Use Plan.
Water toys		A water toy connected to a hose cannot be used at any time.	A water toy connected to a hose cannot be used at any time.	A water toy connected to a hose cannot be used at any time.	A water toy connected to a hose cannot be used at any time.
Warm-season grass 28-day exemption		From 1 September 2010 households and businesses can apply for a one-off, 28-day exemption from water restrictions to enable new warm-season lawns to be established.			

Melbourne

Between January 2007 and August 2010 Melbourne, Victoria implemented Stage 3 (or its variant Stage 3a) water restrictions, which was the most severe stage being implemented for the city during the Millennium Drought.[46] Stage 3 restrictions completely disallowed the use of potable water for lawn watering, although it did allow residential gardens to be watered, and included the following as per the *Drought Response Plan* restriction schedule of April 2010:

"Residential Gardens

- Even/odd address watering schedules
- Manual watering between 6:00 a.m. and 8:00 a.m.
- People age 70 and older can water between 8:00 a.m. and 10:00 a.m.
- Automatic dripper systems can be used to water plants as required on specified watering days between midnight and 2:00 a.m.

Sports Grounds

Councils and schools can water sports grounds in accordance with the Drought Response Plan or submit a water conservation plan. Special allowances are made for exempt playing surfaces which include: turf cricket wickets, golf tees and greens (not fairways), tennis courts, bowling greens, hockey pitches, running tracks, croquet greens.

Vehicle Washing

An efficient commercial car wash that uses 70 litres of water or less per vehicle can be used. Cars may not be washed at home with drinking water. A bucket filled from a tap can be used to clean windows, mirrors and lights; and spot remove corrosive substances.

Industry

Businesses using 10 megalitres of water or more per year must complete a water conservation action plan (waterMAPs program).

Pools and Spas

A new pool or spa of any size capacity cannot be filled with drinking water. However, a new or existing swimming pool or spa may be filled with an alternative water source such as groundwater. An existing pool or spa of less than 2,000 litres may be filled by means of a watering can or bucket filled directly from a tap. An existing pool or spa of greater than 2,000 litres must not be filled except in accordance with a water conservation plan (contact your local water business for more information). An existing pool or spa must not be topped up except by means of a watering can or bucket, filled directly from a tap. Hoses must not be used.

Alternative Water

Greywater, rainwater and recycled water can be used at any time. For guidelines on safe use, visit www.epa.vic.gov.au. Restrictions do not apply to rainwater collected in a storage tank, provided it is not supplemented with drinking water supply.

Penalties and Enforcement

Stage 3 water restrictions must be followed and water patrols are out in force across Melbourne. If you breach the restrictions, you may have your water supply restricted and face fines."

[46] The savewater!® Alliance. (Accessed November 2013). Stage 3 water restrictions apply across Melbourne. http://www.savewater.com.au/uploads/pdffiles/OWOF%20Stage%203%20fact%20sheet.pdf

On December 1, 2012 water restrictions in Melbourne were lifted (from Stage 1) while permanent water use rules remained in place.[47] The permanent water use rules include key requirements regarding hand-held hose, garden and lawn watering, fountains and water features, and cleaning of hard surfaces. The Drought Response Plans for the three Melbourne retail water corporations (City West Water, South East Water and Yarra Valley Water) were revised in 2011 to incorporate the Water Outlook approach which is an adaptive water management strategy based on learnings from the Millennium Drought. [48,49] The plans state that the three Melbourne retail water corporations and Melbourne Water will jointly publish a Water Outlook for Melbourne by the first of December annually, which is, "a summary of the state of Melbourne's water supply and demand" indicating the system storage levels in three zones: high, medium, or low. The December 2013 *Water Outlook* indicates that Melbourne's water storage levels were assessed as being in the high zone and the permanent water use rules will remain in place. The *Water Outlook* includes short and medium term strategies or action plans to manage water security comprising efficiency programs, planning, education, benchmarking, water loss control, rainwater harvesting, stormwater harvesting, use of recycled water, and may include water restrictions.[50]

The three Melbourne retail water corporations also have a Water Restriction By-law that contains a schedule for the four stages of restrictions.[51] As an example, the City West *Drought Response Plan* references the *By-law* (e.g., "The Drought Response Plan may include regulating the use of water via a By-law for water restrictions)."[52] The latest *By-law* and the *Drought Response Plan* were published in June 2012.

Included in the restrictions are rules regarding:

1. Watering gardens, lawns, and playing surfaces
2. Using water for aesthetic purposes
3. Using water in swimming pools and toys
4. Storing or transporting water
5. Cleaning vehicles with water
6. Using water for other cleaning and maintenance purposes
7. Using water for commercial production of plants and/or animals
8. Other uses

The extensive details of each can be found on pages 21 through 27 of the *By-law*. [51]

Southwestern Australia

Information on the Millennium Drought often focuses on southeastern Australia. Southwestern Australia was also hit hard, and did not receive the abundant precipitation experienced in southeast Australia toward the end of 2010. In fact, 2010 was its driest year on record.[33]

[47] Melbourne Water. (Accessed November 2013). Water restrictions.
http://www.melbournewater.com.au/getinvolved/saveandreusewater/Pages/Water-restrictions.aspx
[48] Tan, K.S. and Rhodes, B.G. (2013). Drought severity estimation under a changing climate. Australian Journal of Water Resources, Vol. 17, Issue 2, p143-151.
[49] Rhodes, B.G., Fagan, J.E. and Tan, K.S. (2012). Responding to a rapid climate shift - Experiences from Melbourne Australia, World Congress on Climate and Energy, International Water Association, 13-18 May 2012, Dublin, Ireland.
[50] Melbourne Water. (December 2013). Water Outlook for Melbourne.
http://www.melbournewater.com.au/getinvolved/saveandreusewater/Documents/Water%20Outlook%20December%202013.pdf
[51] City West Water Corporation. (June 2012). Water Restriction By-law.
http://www.citywestwater.com.au/documents/by-law_001_2012.pdf
[52] City West Water Corporation. (June 2012). Drought Response Plan for City West Water Corporation.
http://www.citywestwater.com.au/documents/drought_response_plan.pdf

The Water Corporation of Western Australia delivers water to Perth, which is the largest population center in the state of Western Australia. The agency is governed by the Western Australia Department of Water, which makes rules for the use of water. Perth was in Stage 4 (of seven) water restrictions from 2001 to 2007.[53]

"Stage 4

(1) A person must not water a lawn or garden except by —
(a) reticulation during either, but not both, the morning period or the evening period on one or both of 2 days of the week specified in relation to the relevant property in Schedule 3 Division 2; or
(b) a handheld hose with one outlet; or
(c) a handheld watering can.
(2) A person must not water a grass-covered sporting ground except by —
(a) reticulation during either, but not both, the morning period or the evening period on one or more of 3 days of the week specified in relation to the relevant property in Schedule 3 Division 1; or
(b) a handheld hose with one outlet; or
(c) a handheld watering can.
(3) A person must not spray a building, building site, demolition site (including vacant land resulting from a demolition), path, paved area or road except —
(a) with —
(i) a high pressure water cleaner; or
(ii) a handheld hose with one outlet, to the minimum extent necessary for the cleaning of the building, building site, demolition site (including vacant land resulting from a demolition), path, paved area or road so as to avoid a threat to public health or safety; or
(b) with a handheld hose with one outlet to the minimum extent necessary for purposes related to the construction, demolition or repair of the building, path, paved area or road.
(4) A person must not water a synthetic sporting ground except for 10 minutes or less before a sport is played or practised on the sporting ground."[54]

Under the 2013 Water Service Regulations, Area Three (Perth) is as follows:

"The stage of restrictions that applies in relation to the use of water in Area 3 is —
(a) from 1 June to 31 August in a year — Stage 6; and
(b) at any other time of the year — Stage 4."[55]

The use of stage six from June 1 to August 31 puts a winter sprinkler ban in place.

"Stage 6
(1) A person must not water a lawn or garden except by —
(a) a handheld hose with one outlet; or
(b) a handheld watering can.

(continued on next page)

[53] Institute for Sustainable Futures. (2009). Review of Restrictions Volume 2 – Appendices. http://www.nwc.gov.au/__data/assets/pdf_file/0020/11756/Water_restrictions_Volume_2_appendixes.pdf
[54] Western Australian Consolidated Regulations. (Accessed December 2013). Water Agencies (Water Use) By-Laws 2010 - Schedule 2. http://www.austlii.edu.au/au/legis/wa/consol_reg/waub2010297/sch2.html
[55] Western Australian Consolidated Regulations. (2013). Water Service Regulations 2013 - REG 78. http://www.austlii.edu.au/au/legis/wa/consol_reg/wsr2013284/s78.html

(2) A person must not water a grass-covered sporting ground except by —
(a) reticulation during either, but not both, the morning period or the evening period on one or more of 3 days of the week specified in relation to the relevant property in Schedule 3 clause 1; or
(b) a handheld hose with one outlet; or
(c) a handheld watering can.
(3) A person must not spray a building, building site, demolition site (including vacant land resulting from a demolition), path, paved area or road except —
(a) with —
(i) a high pressure water cleaner; or
(ii) a handheld hose with one outlet, to the minimum extent necessary for the cleaning of the building, building site, demolition site (including vacant land resulting from a demolition), path, paved area or road so as to avoid a threat to public health or safety; or
(b) with a handheld hose with one outlet to the minimum extent necessary for purposes related to the construction, demolition or repair of the building, path, paved area or road.
(4) A person must not fill a swimming pool except —
(a) to replace water lost from the pool through evaporation or ordinary use; and
(b) to the minimum extent necessary for the proper functioning of the pool.
(5) A person must not water a synthetic sporting ground except for 10 minutes or less before a sport is played or practised on the sporting ground."[39]

In the 2009 Institute for Sustainable Futures' *Review of Restrictions* report it was estimated that the restrictions in place from 2001 to 2007 saved 44.2 billion litres (11.7 billion gallons) per year.[35]

The same report noted that the Water Corporation of Western Australia actively patrolled to enforce restrictions during the Millennium Drought, and issued citations. From the text, "The penalties for non-compliance are a warning followed by $1,000 (AUD) fine for second and subsequent offences. Up to 16 staff carry out enforcement activities, which are estimated to cost approximately $600,000 per year (pg. 27)." According to the report there were 17,426 warnings and 6,114 fines issued from July 2003 through February 2007. If 6,114 fines were issued at $1,000 (AUD) it would have generated $6,114,000 (AUD) in revenue.

The Water Corporation of Western Australia is also proud of an aggressive pursuit of alternative water supplies. According to its website, The Water Corporation has committed to recycling 30 percent of its wastewater by 2030. At present it recycles approximately 13.5 percent of wastewater. The Water Corporation of Western Australia goes on to say that, "Over the last 10 years we have increased the total volume of recycled water by almost 70% across WA. In 2012/13 we recycled 21 billion litres (5.5 billion gallons)."[56]

In 2006 the Water Corporation of Western Australia constructed a seawater desalination plant. The plant is reported to produce 45 billion litres (12 billion gallons) of water per year, or 17 percent of Perth's supply.[57] Another desalination plant was constructed in 2011 and later expanded in 2013. It is now able to produce 100 billion litres (26 billion gallons) per year. Together, the two desalination plants are capable of providing almost 50 percent of Perth's water needs.[58]

[56] Water Corporation of Western Australia . (2013). Water Recycling. https://www.watercorporation.com.au/water-supply-and-services/solutions-to-perths-water-supply/water-recycling
[57] Water Corporation of Western Australia . (2013). Perth Seawater Desalination Plant. https://www.watercorporation.com.au/water-supply-and-services/solutions-to-perths-water-supply/desalination/perth-seawater-desalination-plant
[58] Water Corporation of Western Australia. (Accessed December 2013). Southern Seawater Desalination Plant. https://www.watercorporation.com.au/Home/Residential/Water%20supply%20and%20services/Solutions%20to%20Perths%20water%20supply/Desalination/Southern%20Seawater%20Desalination%20Plant

Key Takeaways

Water resource professionals in the United States often question how Australia made it through such a prolonged water shortage, and they seek to learn from the Millennium Drought. The restrictions imposed were severe, but fairly typical of what may be found in a drought plan of a U.S. water provider. Melbourne actually reached such an extreme shortage that it prohibited all lawn watering. The literature also points to water providers aggressively patrolling for violators, and issuing citations and fines. Water use restrictions seem to be the primary mechanism that helped Australians get through the drought. Other strategies include the use of water markets and the building of costly seawater desalination plants. The Millennium Drought also seems to have accelerated the pursuit of alternative water use both on a small and large scale. Water providers, and even the Australian government, have offered a variety of rebates for permanent graywater systems and rainwater tanks and for the expensive connections to toilets and clothes washers. At the time of this writing Victoria seems to be the only entity offering such rebates, perhaps indicating that they are not cost-effective.[59] Water providers in Australia are also developing large scale alternative water supply systems, as is evident from Melbourne, Sydney, and Perth.[50,56,60]

[59] The savewater!® Alliance. (Accessed December 2013). Rebates for Greywater Systems. http://www.savewater.com.au/how-to-save-water/in-the-home/greysmart/suppliers-and-rebates/rebates

[60] Sydney Water. (Accessed December 2013). Stormwater treatment and reuse. http://www.sydneywater.com.au/SW/water-the-environment/what-we-re-doing/current-projects/stormwater-management/index.htm

Emerging and Proactive Drought Management Strategies

What can water providers do beyond the more traditional drought response strategies such as restrictions, pricing, and surcharges to make communities more resistant to the impacts of drought? The examples from Australia reveal large efforts in alternative supply developments, graywater systems, stormwater capture, water reuse, and seawater desalination. Time will tell if these investments are practical and generate benefits that outweigh the costs. Other less traditional ideas for dealing with drought, identified from a variety of sources, are presented below.

The Florida Department of Environmental Protection published, *Recommendations for a Drought Resistant Florida* in 2007. In it, six workgroups identified "drought smart ideas" for the future which included the following actions:

- Implement automated meter reading programs to provide real-time identification of high water usage.
- Increase in the number of mobile irrigation labs for improving efficiency in landscape irrigation.
- Develop more effective enforcement and education programs to promote compliance with landscape irrigation restrictions.
- Create a certification program for irrigation design, auditing, and installation professionals.
- Increase the use of reclaimed water.
- Create emergency orders requiring utilities to implement a water audit program for all ICI customers.[61]

The inclusion of automated meter reading on the list points to the use of new technology to better manage water resources. Technological innovations can be utilized any time to better manage water demand, and can be particularly useful during a drought. Advanced metering infrastructure (AMI), for example, measures customer consumption at a minimum of an hourly frequency and allows utilities to closely monitor water consumption. During a drought, AMI can be used to identify problems such as high water users and leaks, and measure relatively immediate impacts of restrictions.

Programs like WaterSmart Software and H_2O Score represent methods that can be used to provide customers with periodic water use profiles, including a comparison against similar households. A recent study estimated a water use reduction of 4.6 percent and 6.6 percent for two separate study groups in the East Bay Municipal Utility District service area. Customers receive reports either by paper mail or electronic mail. The authors estimate that the unit cost of saved water via WaterSmart Software email reports is between $770-$1,810/MG (USD) ($250-$590/AF) and between $890-$1,750/MG (USD) ($290-$570/AF) for paper reports. The study indicates that participants are more likely to take part in efficiency programs and that the reports are an effective way to communicate with customers.[62]

The Albuquerque Bernalillo County Water Utility Authority's *Drought Management Strategy* contains a couple of unique approaches to reach out to customers. For example, rebates of $20.00 (USD) are offered to customers that take a "DroughtSmart" class on managing landscape water use during drought. Additionally, the *Drought Management Strategy* indicates that if Stage 3 drought measures are introduced a rebate will be provided to customers who pledge to, and successfully accomplish, a 20 percent reduction in water use during a drought period. The Albuquerque Bernalillo County Water

[61] Florida Department of Environmental Protection. (2007). Recommendations for a Drought Resistant Florida. http://fyn.ifas.ufl.edu/materials/Drought%20Smart%20Report%20July%208%202007.pdf

[62] Mitchell, D. and Chesnutt, Thomas. (December 2013). Evaluation of East Bay Municipal Utility District's Pilot of WaterSmart Home Water Reports http://californiawaterfoundation.org/uploads/1389391749-Watersmart_evaluation_report_FINAL_12-12-13%2800238356%29.pdf

Utility Authority's *Drought Management Strategy* also contains specific estimates of savings from the prescribed strategies, rather than broad based reduction goals found in many plans.[63]

The El Paso, Texas Water Utilities - Public Service Board is implementing a variety of strategies beyond its aggressive efficiency programs to improve its resilience. This includes reclaimed wastewater effluent, new conjunctive use supplies, groundwater recharge with treated surface water (aquifer storage and recovery) when demands are low, and desalination of irrigation return flows.[64]

The San Antonio Water System and the City of Kerrville represent two other Texas water providers with aquifer storage and recovery (ASR) programs. According to a 2011 report that assessed the use of ASR in Texas, both communities have been able to avoid severe drought restrictions because of the ability to recover water stored in an aquifer.[65] The SAWS ASR capability was developed, "to capture surplus water during wet months and store it underground for drought management and emergency relief (pg. 18)."[65] Aquifer storage and recovery is utilized throughout the United States but appears to be most prominent in the arid Southwest.[66] The largest ASR project is located in Las Vegas and has been utilized to store 105 billion gallons (320,000 AF) of water. Aquifer storage and recovery has been used in Florida as well, and it is currently being studied for possible use in the Comprehensive Everglades Restoration Plan.[67] The state of Washington has nine ASR projects, and the practice seems to be common in California and the Carolinas as well.[68,69,70] Examples are certainly not limited to the aforementioned, but they demonstrate the geographic and climatic variability of existing ASR projects. Aquifer storage and recovery is a strategy that can help communities save water for times of drought, and there is documentation to demonstrate its role in avoiding severe drought restrictions in two Texas communities.

Short-term curtailment strategies tend to be focused on outdoor water use. The 2011 *WaterSense Specification for Weather-Based Irrigation Controllers Supporting Statement* estimated that as of 2005 there were 13.5 million residential irrigation systems installed in the United States. The reports also estimated that one-third of new homes built will include an irrigation system. As of the 2011 writing, only 10 percent were estimated to use weather-based controllers to schedule irrigation.[71] The 1999 *Residential End Uses of Water* study found that homes with in-ground irrigation systems use 35 percent more water than homes without. Additionally, homes with an automatic timer to control their irrigation system used 47 percent more water than those that operate the irrigation system manually.[72] An update to this study will be released in 2014 and will include more current findings.

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[63] Albuquerque Bernalillo County Water Utility Authority. (2012). Drought Management Strategy. http://abcwua.org/uploads/files/Your%20Drinking%20Water/dms2012.pdf

[64] El Paso Water Utilities. (Accessed December 2013). Past and Present Water Supplies. http://www.epwu.org/water/water_resources.html

[65] Pirnie, Malcolm, and Sjoberg Jackson. (2011). An Assessment of Aquifer Storage and Recovery in Texas. https://www.twdb.state.tx.us/innovativewater/asr/projects/pirnie/doc/2011_03_asr_final_rpt.pdf

[66] United States Environmental Protection Agency. (2012). Aquifer Recharge (AR) and Aquifer Storage & Recovery (ASR) http://water.epa.gov/type/groundwater/uic/aquiferrecharge.cfm#inventory

[67] South Florida Water Management District. (Accessed December 2013). Aquifer Storage and Recovery. http://www.sfwmd.gov/portal/page/portal/xweb%20-%20release%203%20water%20supply/aquifer%20storage%20and%20recovery

[68] State of Washington Department of Ecology. (Accessed December 2013). Aquifer Storage and Recovery (ASR) and Shallow Aquifer Recharge (SAR): tools to supplement water supply. http://www.ecy.wa.gov/programs/wr/asr/asr-home.html

[69] California Environmental Protection Agency. (2013). General Waste Discharge Requirements for Aquifer Storage and Recovery Projects that Inject Drinking Water into Groundwater http://www.swrcb.ca.gov/water_issues/programs/asr/index.shtml

[70] Kenel, P., Moresi, R., and Bloetscher, F. (2004). Survey of ASR Systesm in the Carolinas.

[71] United States Environmental Protection Agency. (2011). WaterSense Specification for Weather-Based Irrigation Controllers Supporting Statement. http://epa.gov/watersense/docs/final-controller-supporting-statement_102611_final508.pdf

[72] Mayer, P. W., & Deoreo, W. B. (Eds.). (1999). Residential end uses of water. American Water Works Association.

In 2008 the Southern Nevada Water Authority (SNWA) commissioned the development of, and then tested, devices that mechanically adjusted automatic irrigation systems to comply with watering restrictions. The device was referred to as the Water Group Assistant, in reference to the six geographical watering restriction groups. During the time of the product testing SNWA had one day per week restrictions in the winter months, three day per week watering restrictions in the spring and fall months, and unrestricted watering days in the summer months. The devices reportedly resulted in increased compliance with restrictions, and lower water use during restricted times, but annual water savings were similar to a treatment group that did not have the Water Group Assistant. At present the devices have not been distributed beyond the test group or pursued further.[73,74]

Many water providers and communities promote drought tolerant landscapes as a way to curb outdoor water use. Landscapes designed to withstand drought will be more likely to survive a period of low precipitation that is combined with outdoor water use restrictions. This will lessen the costs associated with loss of landscape vegetation during a drought, place less of a hardship on customers, and lessen the demand on water supplies. Some water providers have demonstration gardens and promote the use of native and drought tolerant vegetation via guidebooks and/or a list of plants.[75,76,77] Ultimately, it is possible for customers to have drought tolerant landscapes that are attractive and can be enjoyed. There are even ways to manage turf grass to make it more resistant to drought such as the height at which is cut and how it is watered.[78]

In California, the 2006 *Water Conservation in Landscaping Act* required cities and other political entities to adopt efficient landscape ordinances. The Department of Water Resources (DWR) released the *Model Water Efficient Landscape Ordinance* that was approved by the Office of Administrative Law in September 2009. Local agencies had until January 1, 2010 to adopt the DWR's model ordinance or tailor their own as long as it was at least as effective as the model in regard to water efficiency.[79,80] Los Angeles County adopted the *Drought-Tolerant Landscaping Ordinance* in 2008 as part of its Green Building Program. The *Drought-Tolerant Landscape Ordinance* contains regulations for all new construction and major renovations. The ordinance became effective on January 1, 2009 and applies to unincorporated areas in Los Angeles County. The County also provides a guidebook and a list of drought tolerant plants and turf.[81]

[73] American Water Works Association. (May 2008). SNWA Working on Devices that Automatically Adhere to Water Restrictions. Journal of American Water Works Association.
[74] Sovocool, Kent et al. (2011). SNWA Watering Group Assistant Study. Presentation at the WaterSmart Innovations Conference and Exposition. http://www.watersmartinnovations.com/2010/PDFs/11-T-1113.pdf
[75] City of San Diego, California. (Accessed January 2014). The Greenhaven at Ridgehaven Xeriscape Demonstration Garden. http://www.sandiego.gov/environmental-services/geninfo/ridgehaven/garden.shtml
[76] City of Prescott, Arizona. (2006). Low Water Use Drought Tolerant Plant List. http://www.cityofprescott.net/_d/plant_list.pdf
[77] Las Virgenes Municipal Water District. (2009). A California-Friendly Guide to Native and Drought Tolerant Gardens http://www.lvmwd.com/home/showdocument?id=711
[78] United States Environemntal Protection Agency. (2013). Water-Smart Landscapes Start With WaterSense®. http://www.epa.gov/WaterSense/docs/water-efficient_landscaping_508.pdf
[79] California Department of Water Resources. (September 2009). Model Water Efficient Landscape Ordinance. http://www.water.ca.gov/wateruseefficiency/docs/MWELO_TbContent_Law.pdf
[80] California Department of Water Resources. (October 2009). The Updated Model Water Efficient Landscape Ordinance. http://www.water.ca.gov/wateruseefficiency/docs/MOBrochure.pdf
[81] L.A. County Green Building Program. (Accessed January 2014). http://planning.lacounty.gov/green

Los Angeles County, California, Code of Ordinances - Section 22.52.2230 Drought-Tolerant Landscaping Requirements.

All projects shall comply with the drought-tolerant landscaping requirements of this Section 22.52.2230

A. The total landscaped area of a lot or parcel of land on which a project is situated shall satisfy the following:

1. A minimum of seventy-five (75) percent of such total landscaped area shall contain plants from the drought-tolerant plant list;
2. A maximum of twenty-five (25) percent of such total landscaped area shall consist of turf, however, in no event shall turf be planted in strips that are less than five (5) feet wide, and in no event shall the total landscaped area contain more than five thousand (5,000) square feet of turf;
3. All turf in such total landscaped area shall be water-efficient. The green building technical manual shall contain a list of turf that meets this requirement; and
4. The plants in such total landscaped area shall be grouped in hydrozones in accordance with their respective water, cultural (soil, climate, sun, and light), and maintenance requirements.

B. For single-family residences, in addition to the landscaping requirements of subsection A of this Section 22.52.2240, in calculating the maximum square footage of turf used, the turf in the residence's rear and side yards shall be included in the measurement of the turf used for the total landscaped area. [82]

The United States Environmental Protection Agency identified drought-related climate adaptation strategies for water utilities in its 2013 *Adaptation Strategies Guide for Water Utilities*. While efficiency was included in the list, below are less common approaches offered in the paper:

- "Practice conjunctive use (i.e., optimal use of surface water and groundwater).
- Finance and facilitate systems to recycle water, including use of greywater in homes and businesses.
- Acquire and manage ecosystems, such as forested watersheds, vegetation strips, and wetlands, to regulate runoff.
- Build infrastructure needed for aquifer storage and recovery, either for seasonal storage or longer-term water banking, (e.g., recharge canals, recovery wells).
- Diversify options to complement current water supply, including recycled water, desalination, conjunctive use, and stormwater capture.
- Expand current resources by developing regional water connections to allow for water trading in times of service disruption or shortage.
- Increase water storage capacity, including silt removal to expand capacity at existing reservoirs and construction of new reservoirs and/or dams.
- Increase or modify treatment capabilities to address treatment needs of marginal water quality in new sources.
- Retrofit intakes to accommodate lower water levels in reservoirs and decreased late season flows.

[82] Los Angeles County, California, Code of Ordinances - Title 22 – Planning and Zoning - Division 1 - Planning and Zoning - Chapter 22.52 - General Regulations - Part 21 Drought-Tolerant Landscaping - Section: 22.52.2230 Drought-Tolerant Landscaping Requirements. http://library.municode.com/HTML/16274/level4/TIT22PLZO_DIV1PLZO_CH22.52GERE_PT21DRLELA.html#TIT22PLZO_DIV1PLZO_CH22.52GERE_PT21DRLELA_22.52.2230DRLELARE

- Build or expand infrastructure to support conjunctive use.
- Build systems to recycle wastewater for energy, industrial, agricultural, or household use."[83]

Many of the drought strategies in this section represent proactive approaches to provide stability in future times of drought rather than the reactive strategies common in most drought plans. Reactive curtailment strategies are critically important and effective in managing water demands during a shortage. Proactive strategies like the use of alternative water sources may help water providers better prepare for and cope with future droughts.

[83] United States Environmental Protection Agency. (2013). Adaptation Strategies Guide for Water Utilities. http://water.epa.gov/infrastructure/watersecurity/climate/upload/epa817k13001.pdf

Weather History and Climate Change

Weather has a direct impact on water use, and weather data play a key role in planning for the future. Past weather averages are often used in water demand forecasts and the drought of record is frequently referenced as a worst case scenario for drought plans. Using averages or examples of extreme events from our recorded history of weather data may prove to be insufficient for two reasons. (1) Weather patterns before our recorded history may have been quite different than what has been documented, and (2) future changes in weather may not adhere to what we have come to perceive as normal.

To understand weather patterns before our recorded weather data, many researchers are studying tree rings. According to Cleaveland et al. (2011), many water providers in Texas use the drought of the 1950s, which occurred from 1950-1956, as a worst case scenario. Their research indicates that droughts of the past were longer lasting and more intense than the drought in the 1950s.[84] Stahle et al. found that droughts in the 1750s, 1820s, and 1850s-1860s were similar to the 1950s drought but found evidence of a megadrought in the 1500s that, "far exceeded any drought of the 20th century." It is estimated that a megadrought lasted around 40 years in the Southwest and Mexico.[85]

Herweijer et al. also discuss the megadroughts of the last millennium and note the much longer multi-decade durations. The authors also go on to say that in their research they have identified a relationship between La Niña and drought in North America, "cool 'La Niña–like' conditions in the tropical Pacific are consistent with North American drought (pg. 1353)."[86]

A look into the past, beyond our weather records, indicates droughts have lasted much longer than those of the last century. What about future droughts?

The U.S. Global Change Research Program's 2009 *Global Climate Change Impact in the United States* report indicates that future changes in climate could result in widespread increases in heavy precipitation events with longer dry spells in-between. A region could receive less overall precipitation but have an increase in heavy rain events. Due to rising temperatures there may be less snow pack in the future, which many water providers rely on for water supply. The report also suggests that changes in atmospheric circulation will likely move storm tracks northward. This will make droughts in arid regions of the Southwest longer and more severe. The authors' key messages in regard to the impact of climate change on water resources are:

- "Climate change has already altered, and will continue to alter, the water cycle, affecting where, when, and how much water is available for all uses.
- Floods and droughts are likely to become more common and more intense as regional and seasonal precipitation patterns change, and rainfall becomes more concentrated into heavy events (with longer, hotter dry periods in between).
- Precipitation and runoff are likely to increase in the Northeast and Midwest in winter and spring, and decrease in the West, especially the Southwest, in spring and summer.
- In areas where snowpack dominates, the timing of runoff will continue to shift to earlier in the spring and flows will be lower in late summer.

[84] Cleaveland, M. K., Votteler, T. H., Stahle, D. K., Casteel, R. C., & Banner, J. L. (2011). Extended chronology of drought in south central, southeastern and west Texas. Texas Water Journal, 2(1), 54-96.
[85] Stahle, D. W., Cook, E. R., Cleaveland, M. K., Therrell, M. D., Meko, D. M., Grissino-Mayer, H. D., ... & Luckman, B. H. (2000). Tree-ring data document 16th century megadrought over North America. EOS, Transactions American Geophysical Union, 81(12), 121-125.
[86] Herweijer, C., Seager, R., Cook, E. R., & Emile-Geay, J. (2007). North American droughts of the last millennium from a gridded network of tree-ring data. Journal of Climate, 20(7), 1353-1376.

- Surface water quality and groundwater quantity will be affected by a changing climate.
- Climate change will place additional burdens on already stressed water systems.
- The past century is no longer a reasonable guide to the future for water management (pg. 41)." [87]

Others suggest global warming will not cause droughts, but that it will cause droughts to set in faster and be more severe.[88]

A look at past weather history via tree ring data suggests that droughts have lasted for up to 40 years in the United States. The climate of the future may also bring droughts of varying severity and duration. Additionally, dry regions may see an increase in aridity. Planning for future drought should consider the possibility for large deviations from long-term averages and droughts of record.

[87] Karl, T. R., Melillo, J. M., & Peterson, T. C. (Eds.). (2009). Global climate change impacts in the United States. Cambridge University Press.
[88] Trenberth, K. E., Dai, A., van der Schrier, G., Jones, P. D., Barichivich, J., Briffa, K. R., & Sheffield, J. (2014). Global warming and changes in drought. *Nature Climate Change*, *4*(1), 17-22.

Summary

The title of this paper is, *Considerations for Drought Planning in a Changing World*. What specifically is changing?

- Population and economic growth is putting pressure on water supplies in some locations even under normal weather conditions.
- The U.S. climate is changing which may alter precipitation and temperature patterns. Additionally, more frequent extreme weather events have been predicted.
- Our understanding of "normal" weather patterns is being challenged by research that looks at weather before recorded history.
- Many water providers have permanent water use restrictions in place that, in the past, represented the front line of drought management strategies.

What can be done to adapt to these changes? Improved planning and adoption of new strategies will likely play a key role in responding to future droughts. Below are themes that emerged during the research for this paper.

Planning

- Plan with a new perspective on drought of record and "normal" weather.
- Plan for climate change based on available regional and local projections.
- Plan for and monitor short-term climatic events that drive changes in temperature and precipitation such as El Niño and La Niña.
- Consider an approach like Denver Water's, if feasible, that allocates a portion of water saved through long-term efficiency programs to a drought reserve.
- Update water demand forecasts and water supply plans regularly.
- Profile the various end uses in the service area and identify those that can be curtailed during a shortage with the lowest economic and societal costs.
- Create detailed estimates of savings for variety drought response strategies such as restrictions and changes in pricing.
- Analyze the revenue impacts of changes in demand resulting from short-term curtailment and have a plan in place to create stability.
- Identify supply options (if any) that can be called upon during a shortage and weigh the costs against costs of curtailment.

Topics that Emerged in Literature Review that Represent Emerging Drought Management Options Beyond Traditional Restrictions and Surcharges

- Advanced metering infrastructure (AMI) use to closely monitor water consumption during droughts to identify leaks and high water users, and to track progress of curtailment efforts.
- Large scale water reuse projects.
- Conjunctive use.
- Aquifer storage and recovery.
- Water transfers and trading.
- Innovative customer education and interaction.
- Drought tolerant landscapes.
- Landscape irrigation efficiency improvements and managing landscape water use in times of drought.
- New technological options for managing automatic irrigation systems.

- Landscape irrigation restriction enforcement and education regarding compliance.

Being prepared for drought will increase service reliability and help reduce the social, environmental, and economic costs associated with water shortages. All service areas have unique supply and demand characteristics that will determine what approaches will be realistic and effective. Traditional short-term curtailment strategies are still proving to be reliable demand reduction options. Changes in water pricing and the use of surcharges, combined with good communication and outreach to customers, have also demonstrated efficacy. There are past case studies to learn from, changes in planning to consider, and emerging options that can be pursued, all of which will help communities become more resistant to drought.

Georgia Water Wise Council

Cash, Tim

From: Joy Hinkle <jhinkle@southface.org>
Sent: Tuesday, August 19, 2014 4:05 PM
To: Cash, Tim
Subject: Drought Management Rule - Stakeholder Meeting #2
Attachments: 2014-08-19_GWWC Drought Rule Comments.pdf

Dear Mr. Cash,
Georgia Water Wise Council (GWWC) appreciates the opportunity to provide the attached comments on the drought rule update process. Our diverse membership of water and green industry professionals as well as NGOs came to consensus on a number of issues in the Stakeholder Draft.

As the new GWWC Chair, I am happy to answer any questions or provide clarification on our comments. Thank you again for the opportunity to provide input to this important process.

Joy Hinkle
Sustainable Communities Associate, Southface
Voice: 404-604-3634 | Fax: 404-872-5009
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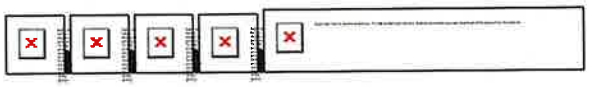
Web: www.southface.org



Georgia WaterWise Council
A SECTION OF THE GEORGIA ASSOCIATION OF WATER PROFESSIONALS
1655 ENTERPRISE WAY | MARIETTA, GA 30067 | 770-618-8690

Mr. James A. Capp
Chief, Watershed Protection Branch, EPD
2 Martin Luther King Jr. Drive, Suite 1152 East
Atlanta, GA 30334

August 18, 2014

RE: Drought Management Rule – Stakeholder Meeting #2

Dear Mr. Capp:

The Georgia Water Wise Council (GWWC) appreciates the opportunity to again comment on the proposed amendments to Georgia's Drought Management Rule. As a Section of the Georgia Association of Water Professionals, GWWC brings water industry and green industry professionals, as well as Environmental NGOs together to promote sound water efficient policy and practices in Georgia. The Council met on August 11, 2014 and our diverse membership came to consensus on multiple issues regarding the current Stakeholder Draft and update process. We appreciate the opportunity to provide feedback on the following topics:

Applicability
Times of drought require commitment from all water uses in order to protect our water resources. GWWC believes several applicability definitions should be revised and clarified:

- Recreational turf should not be exempt as a "farm use," regardless of geography. Differing definitions for upstream and downstream of Peachtree Creek seems arbitrary and would be very difficult for a utility to manage if parts of a single service area were subject to different rules. A more manageable approach would be to treat all recreational turf irrigation like golf courses and have some set of rules and restrictions at each declared drought level.
- "Processing of perishable agricultural products" needs to be further defined in order to be exempt from drought rules as a "farm use." For example, many poultry processing plants purchase water from municipal water utilities; water providers need further clarification and guidance on how to address "farm use" customers during periods of mandated water use reductions.
- The blanket exemption of water users withdrawing less than 100,000 gallons per day should be reconsidered to recognize the cumulative impacts smaller systems have on our water resources. By Drought Level 3 all permittees, regardless of size, should have some responsibility to reduce water use.

Drought Indicators and Triggers
Georgia needs a comprehensive system of climatic and hydrological triggers to evaluate and use to make drought declaration decisions. As stated in our first comment letter on this draft rule, GWWC would again recommend reviewing examples of such indicators and triggers from other states. Additionally, the following process changes could strengthen public understanding of drought conditions:

- Allow local jurisdictions to identify and set their own indicators and triggers. This would ensure drought declarations are made on fact-based hydrological conditions rather than political realities. Local triggers could potentially be required and communicated to EPD through local drought contingency plans. EPD could then evaluate local triggers at a regional or watershed level to determine the appropriateness of a statewide drought declaration.
- Include triggers for stepping back drought levels when local hydrological conditions improve, and allow for an incremental improvement process that results in levels being partially stepped back.

Drought Declaration Process
Having appropriate local indicators and triggers in place will allow the drought declaration process to be less politicized. GWWC encourages the updated rules to:

- Reduce the discretion given to the EPD Director to independently declare drought.
- Include details on how and when utilities and other permit holders will be notified of drought declaration.

Drought Response Committee
GWWC strongly supports a diverse Drought Response Committee. As the primary entity responsible for the successful evaluation and declaration process during a drought, it is vital for specifics of the committee to be clarified during the rule update process. GWWC recommends the following structure for the drought response committee:

- Regional representation, based upon watersheds or river basins rather than political jurisdictions. This regional representation is consistent with state water planning and would result in more accurate declarations.
- Representatives from all sectors affected by drought in each region, including members from water utilities, agriculture, industry, and environmental interests.
- Explicitly defined roles and responsibilities.

Record Keeping and Reporting
Timely and accurate information is critical to decision making during times of drought. In order for EPD to have access to the best information possible, GWWC recommends the following for record keeping and reporting:

- Tweak existing reporting (such as the MOR) rather than create new reports. Any reports should dovetail with existing Water Use and Efficiency reporting.
- Online applications should be developed to make all reporting faster to submit and easier for the public to understand and access the information submitted.

Drought Response Strategies

The resources affected by drought are shared resources and therefore, preserving them during drought is a shared responsibility. GWWC advocates appropriate response strategies that apply to the basin or watershed affected, and are not delineated solely along political boundaries. The following issues should also be considered at all levels of drought response:

- All stakeholders should be taken into account, including power generation, industrial permittees, and agriculture, as well as the municipal sector. Implementation and mitigation strategies cannot be placed solely upon municipal providers and those that depend upon municipal supply. This causes a disproportionate amount of harm to those entities, while not providing a comprehensive resource-wide response strategy.
- Outdoor watering regulations and conservation pricing implemented in recent years have significantly lowered Georgia's peaking factor. Any updated drought rules must recognize this reality and not require unrealistic percent reduction rules that are based on peaking factors found in drier arid regions.
- The proposed response levels penalize utilities and permittees that are already operating efficiently. The rules need to be more incremental and account for the permanent conservation progress already made since the last major drought.
- Further clarification and education is needed on a variety of issues, including how to calculate baseline water use, the use of odd/even water days during non drought, and the appropriate level and extent of limiting use of fire hydrants and efficient irrigation methods such as drip irrigation and hand watering.

Drought Surcharge

Under certain circumstances drought surcharges can be an appropriate tool for local utilities to maintain revenue during times of drought. However, GWWC feels mandated drought surcharges are unnecessary and inappropriate as part of a statewide rule. We encourage this provision be removed from any future proposed drought rules for multiple reasons:

- Local water rate setting is not a state level issue.
- The mechanics of implementing a surcharge – billing changes, extra meter readings, etc. – are unfeasible for many smaller utilities.
- Surcharges equate to a "double hit" for utilities with increasing block/conservation rate structures. Requiring all utilities to have increasing block rate structure sends a stronger message to consumers and may be a more appropriate response statewide.

As the statewide organization representing conservation and efficiency in the state, GWWC remains vested in helping EPD develop appropriate and effective drought management rules. We appreciate and value the opportunity to participate in this vital process.

Sincerely,

Georgia Water Wise Council

Gwinnett County

Cash, Tim

From: Heather.Moody@gwinnettcounty.com
Sent: Tuesday, July 29, 2014 4:30 PM
To: Cash, Tim
Subject: Drought rules comments
Attachments: Drought rules comments_HMoody_July14.pdf

Tim,

I appreciate the opportunity to provide input during this process. My comments for consideration are attached.

Thank you,

Heather Moody
Water Conservation Coordinator
Gwinnett County Department of Water Resources
678-376-6722
Heather.Moody@gwinnettcounty.com

1) I would like to see an odd/even days of the week restriction on outdoor watering that kicks in on Drought Response Level 2. For simplicity when explaining these rules to the public, I would rather keep the hours limitation for Level 2 the same as Level 1—8:00pm to 8:00am.

   I think an odd/even schedule as drought severity increases better conveys the message that watering every day is not essential. It would also provide a better intermediate step between Levels 1 and 3.

2) I personally support the idea of a drought surcharge from the perspective that it could help discourage inefficient/unnecessary use and serve as an attention-getting measure on the water bill. People may discard a newsletter article about the drought, or even ignore a special message on the water bill, but almost everyone will notice a new surcharge!

   Our billing system would be able to add a surcharge given reasonable notice. We would want to add surcharges only for those who bump into our tier two (above 8,000 gal/month) and tier three (above 12,000 gal/month) rates. Those who keep their household use under 8,000 gallons per month would not face a surcharge. This approach would reward efficient behavior and encourage residents to limit their water use to basic needs only during a drought. Furthermore, a surcharge is a way to encourage conservation without specifically targeting outdoor use, a strategy that I believe the green industry would favor.

   I strongly encourage EPD to not make this surcharge optional. If it becomes an option most jurisdictions will just choose not to implement it, and those that do will face great wrath from their customers! Our public outreach and customer service staff would like to be able to say that the surcharge is a mandatory state requirement. I appreciate the effort and intent to address revenue concerns for the utilities. However, I feel that EPD should either make the surcharge mandatory for all jurisdictions included in the drought or just drop the idea all together.

3) On several occasions during stakeholder meeting #2, the importance of public education and "getting the message out" was stressed. Because the utilities are not going to be able to quickly increase their outreach staff in the event of a drought, what level of support will EPD be able to provide? It is my understanding that since the departure of Alice Miller Keyes, EPD no longer has anyone focusing on drought education and outreach. Is there someone we will be able to turn to for materials and information?

   Perhaps EPD should plan to develop template materials such as press releases, newsletter articles, bill stuffers, flyers, web copy, teacher curriculum, etc. that local utilities can then personalize and use to communicate the new rules quickly to our customers. This would allow us all to work from the same script, so to speak, and drought messaging throughout the state would be more clear and consistent for the public.

   Drought messaging is regional or even state-wide in nature— it makes sense to have our local efforts supported by EPD. Ideally, the state develops the messages and local utilities help to disseminate those messages in our local communities. To me this speaks to the goal of developing a "culture of conservation" in Georgia as directed by the Governor in the WSA.

Cash, Tim

From: Susan.Lee@gwinnettcounty.com
Sent: Monday, July 28, 2014 11:03 AM
To: Cash, Tim
Cc: Charlotte.Nash@gwinnettcounty.com; Glenn.Stephens@gwinnettcounty.com; Ron.Seibenhener@gwinnettcounty.com; Kevin.Farrell@gwinnettcounty.com; TEdwards@ACCG.org; Debbie.Savage@gwinnettcounty.com; Rebecca.Flickinger@gwinnettcounty.com
Subject: Proposed Changes to Drought Management Rules - Comments from Gwinnett County

Good morning, Tim -

Per EPD's request, subject matter experts from our Department of Water Resources here in Gwinnett County have formulated the following comments regarding the proposed drought management rules:

Gwinnett County's Comments on EPD's proposed Drought Management Rule

- From a big picture perspective, this is perhaps being made much too complicated. If it can't be easily understood by the public, it will be generally ignored and that will not meet the intended goal of protecting water supplies. Consideration should be given to a review of all proposed language with a goal of simplifying things where possible.

- Regarding the general idea of % water use reduction targets....what are the implications for a permittee if targets not attained? Should the targets be with regard to net use instead of just use? Is it a target reduction in water withdrawal, or water production, or water sold? Should any target instead be a particular residential per capita use rate instead? The question should be asked: What would be the downside of not even getting into the notion of reduction targets?

- Regarding new monthly Water Use Reporting Forms (all the time...not just during drought), this seems like a duplication or triplication of effort as permittees already send monthly water withdrawal information and/or water production data to both EPD's Drinking Water Program & EPD's Water Withdrawal Program. If it is determined that some additional information is needed, consideration should at least be given to incorporating it into either of the currently submitted reports.

- Regarding the Surcharge Pricing... perhaps some bounds have been overstepped here. Consideration should be given to letting a surcharge pricing program be an option rather than a requirement.

- All the minor % tweeks to reduction targets & % of streamflow, "2.5%", "1.0%", "0.75%", "1.25%", etc., seem rather arbitrary and if they are just targets, why the need to fine tune things to the 0.5 & 0.25 % level? Rather than get into all this tweeking based on reservoir level or streamflow or audit score (& % return flow should be considered in this mix also)...why not just guide folks to using this type of information in their variance request?

- Hopefully, in advance of any declarations, folks in the anticipated area of concern will be able to voice their concerns of support or dissent to the Director or Drought Response Committee.

- Does this mean all providers will again have to revise local drought ordinances?

- Consideration could perhaps be given to an alternative set of water use reduction "targets". One option may be to come up with net per capita use targets for the various drought response levels instead of a % use reduction from some baseline. Using % use reduction targets may be inequitable in that they do not account for the fact that some systems have already squeezed on use reduction much more than others. Similarly, the % use reduction targets may be inequitable in that systems that return 100% of their withdrawals are treated just the same as systems that return 0% of their withdrawals. Utilizing something like net per capita use targets may resolve some of these inequities.

- Regarding the notion of not allowing variance requests from COE associated supplies.....Why? It's just a request for EPD's review. There is no downside to allowing a request that can be reviewed based on its merits or lack thereof.

- Regarding the notion of responding to variance requests in 5 days.....consideration should be given to qualifying that as a "complete" variance request. In many cases it's likely that a complete variance request could be very different from what originally arrives at EPD as a request.

- Consideration could perhaps be given to progressively reducing the days of outdoor water use rather than just the hours. The way it stands now, the move from Level 2 to Level 3 may seem abrupt in that it goes from allowing irrigation some hours everyday to no hours on no days.

We hope that this information is helpful, as EPD continues to develop proposed rules, and we look forward to future meetings on the topic.

If you have questions, or need follow-up information, please contact Kevin Farrell at: kevin.farrell@gwinnettcounty.com

Thank you.

Susan G. Lee

Legislative Liaison

Gwinnett County Board of Commissioners

770.822.7427

Cash, Tim

From: Kevin.Farrell@gwinnettcounty.com
Sent: Wednesday, July 23, 2014 12:47 PM
To: Cash, Tim
Subject: a few comments on new Drought Rule from Gwinnett County
Attachments: droughtrulerevision.docx

Hello Tim,

Missed you at the meeting on the 15th. Hope you are better now and have had a wonderful summer.

I've attached a few comments on this topic for consideration. If I can ever help with anything, please don't hesitate to contact me (678 376 7179) and ask.

Thanks for all you do and take care sir.

Kevin Farrell, Section Manager
Regulatory Compliance & Permitting Section
Gwinnett County Department of Water Resources
684 Winder Highway
Lawrenceville, GA 30045-5012

Comments on EPD's proposed Drought Management Rule 7/23/14

1) From a big picture perspective....I'd say this is perhaps being made much too complicated. If it can't be easily understood by the public...it will be generally ignored and that will not meet the intended goal of protecting water supplies. Consideration should be given to a review of all proposed language with a goal of simplifying things where possible

2) Regarding general idea of % water use reduction targets....what are the implications for a permittee if targets not attained?.....should the targets be with regard to net use instead of just use?.....is it a target reduction in water withdrawal or, or water production or water sold?....should any target instead be a particular residential per capita use rate instead?.... The question should be asked...what would be the downside of not even getting into the notion of reduction targets.

3) Regarding new monthly Water Use Reporting Forms (all the time...not just during drought), this seems like a duplication or triplication of effort as permittees already send monthly water withdrawal information and/or water production data to both EPD's Drinking Water Program & EPD's Water Withdrawal Program. If it is determined that some additional information is needed, consideration at least be given to incorporating it into either of the currently submitted reports.

4) Regarding the Surcharge Pricing... perhaps some bounds have been overstepped here. Consideration should be given to letting a surcharge pricing program be an option rather than a requirement.

5) All the minor % tweeks to reduction targets & % of streamflow, "2.5%", "1.0%", "0.75%", "1.25%"...etc...etc... seem rather arbitrary and if they are just targets....why the need to fine tune things to the 0.5 & 0.25 % level. Rather than get into all this tweeking based on reservoir level or streamflow or audit score (& % return flow should be considered in this mix also)...why not just guide folks to using this type of information in their variance request.

6) Hopefully in advance of any declarations, folks in the anticipated area of concern will be able to voice their concerns of support or dissent to the Director or Drought Response Committee.

7) Does this mean all providers will again have to revise local drought ordinances?

8) Consideration could perhaps be given to an alternative set of water use reduction "targets". One option may be to come up with net per capita use targets for the various drought response levels instead of a % use reduction from some baseline. Using %use reduction targets may be inequitable in that they do not account for the fact that some systems have already squeezed on use reduction much more than others. Similarly, the % use reduction targets may be inequitable in that systems that return 100% of their withdrawals are treated just the same as systems that return 0% of their withdrawals. Utilizing something like net per capita use targets may resolve some of these inequities.

9) Regarding the notion of not allowing variance requests from COE associated supplies.....Why?...it's just a request for EPD's review. There is no downside to allowing a request that can be reviewed based on it's merits or lack thereof.

10) Regarding the notion of responding to variance requests in 5 days.....consideration should be given to qualifying that as a "complete" variance request. In many cases its likely that a complete variance request could be very different from what originally arrives at EPD as a request.

11) Consideration could perhaps be given to progressively reducing the days of outdoor water use rather than just the hours. The way it stands now, the move from Level 2 to Level 3 may seem abrupt in that it goes from allowing irrigation some hours everyday to no hours on no days.??

Houston County

Cash, Tim

From: RDunbar@houstoncountyga.org
Sent: Monday, July 28, 2014 10:12 AM
To: Cash, Tim
Cc: TEdwards@ACCG.org
Subject: Drought Management Rule - Stakeholder Meeting #2
Attachments: Comments to Drought Managment Rules_July 25 2014.pdf

Good Morning Mr. Cash:
Please find attached a collaboration of comments from our staff and consultant in regard to proposed changes to Drought Management Rule. Thank you for your kind consideration of our comments. If you need additional information, or have any questions regarding our comments, please do not hesitate to contact me at:

Robbie Dunbar, Director of Operations
Houston County Board of Commissioners
2018 Kings Chapel Road
Perry, GA 31069
(478) 987-4280

or by email at rdunbar@houstoncountyga.org. Please respond to let me know you have received our comments. Thanks.

Comments to the Proposed Draft Drought Management Rule AS OF July 3, 2014

1. **Where is the local input?**
   Section 391-3-30-.04(2) states "the Director may consult with **state and federal** entities charged with collecting, interpreting and disseminating data used as a basis for developing drought indices." **What about the local entity?** The concern would be the public water system is not being given an opportunity to have input on drought declarations prior to enactment. Houston County Water, for instance, has invested in a monitoring network now for close to 10 years that includes full time monitoring wells as well as monitoring of over 60 production wells in cooperation with multiple cities, industry, and Robins AFB all within Houston County. These efforts have been made for the purpose of understanding the water resource and the impact of usage of that resource on surrounding systems. This information would be beneficial to study before a drought declaration is made.

2. **Drought Response Committee**
   Section 391-3-30-.06(1) states a Drought Response Committee "may be convened by the Director at any time for purposes of consulting on the development and/or implementation of pre-drought mitigation strategies or drought response strategies…" The concern would be **some assurance of fair representation** on the committee for those areas potentially affected by a drought declaration.

3. **Drought Surcharge Program**
   Achieving the water usage reduction goal through a drought surcharge program would not be an exact science. **How do you truly determine the price incentive for customers to reduce water demand?** This may take multiple iterations to accomplish the stated reduction goal. The concerns would be customer frustration and the likely burden of policy making and public relations placed back on the water system to serve its customers in a clear, consistent manner. In other words, a potential public relations nightmare enforcing multiple rate changes over short periods of time to achieve a reduction goal.

4. **Drought Response Level 3 – Numeric Reduction Target**
   Section 391-3-30-.08(4)(e) states that reduction targets shall be achieved "for the same month…of the year immediately preceding the declared drought…" **The concern would be why just one year preceding the declared drought?** Wouldn't a better baseline be the previous 3 year average or previous 5 year average before the declared drought? This would help control variables such as growth, industry gain/industry loss, and previous wet or dry years.

5. **Drought Response Level 2 or 3 – Impact on Industry**
   This is a very slippery slope for systems that rely heavily on industry for revenue. There are political and economic impacts for applying surcharges to industries that are supplied water by the public water system. We really don't know the severity of these impacts when Level 2 & 3 reductions are triggered. Often, these industries pay a lot of taxes, employ a lot of citizens, and pay a lot of water bills. Public water systems serving these industries do NOT want to jeopardize that relationship. So the concern would be the inherent problem in reducing usage to an industry that represents a sizable portion of overall water usage (and revenue) in a public water system. For example, in Houston County, Frito-Lay and Cogen use about 10% of the overall water supplied by Houston County Water. Both companies have contractual agreements for water and could not be reduced in supply. There seems to be no exemptions or separate treatment spelled out in the rules to account for and accommodate this example.

6. **Drought Response Level 3 – Numeric Reduction Target Worksheet**
   The worksheet requires the average daily amount of ground water pumped into the distribution system to be entered on a monthly basis. It also requires the average daily amount of water sold to other water systems to be entered on a monthly basis. The problem lies in the fact that many systems record groundwater usage on a monthly basis while billing cycles are often recorded mid-month to mid-month. Thus, the billing cycles and recorded groundwater usage do not have the same beginning and ending points. Under Level 3 conditions, these monthly reports have to be submitted to the state within 5 days of the following month. So the state would need to be prepared to not receive completely up-to-date information due to the lag in billing cycle data.

7. **Unintended Consequences**
   A broad stroke concern would be the unintended consequence of adversely impacting razor thin utility system budgets with a water use reduction. If the stated goal of revenue neutral practices is not achieved, there could be great hardship placed on public water systems, particularly those facing high debt service loads. These drought surcharge programs and numeric reduction targets are not cheap to implement or enforce. They place additional burdens (and thus cost) on public systems that will need to increase education efforts, enforcement efforts, and operation efforts. It seems there needs to be a way for water systems to appeal for financial reasons to the state if the rules place an undue burden on the system.

LaGrange

Cash, Tim

From: Mike Criddle <MCriddle@lagrangega.org>
Sent: Tuesday, August 19, 2014 3:45 PM
To: Cash, Tim
Cc: Tom Hall; Patrick Bowie
Subject: Drought Management Rule - Stakeholder Meeting #2
Attachments: EPD Drought Management Rules 08-19-14.pdf

Tim

Good afternoon sir, hope all is well with you. Please find attached the official comments from the City of LaGrange regarding the Drought Management Rule – Stakeholder Meeting #2.

Let me know if you have questions or need any clarification of the contents. Thanks very much for your consideration of these comments.

Mike Criddle
Director of Economic Development
City of LaGrange
(706) 883-2055

LaGRANGE georgia

SMART MOVE®

August 19, 2014

Mr. James A. Capp, Chief, Watershed Protection Branch, EPD
Georgia Department of Natural Resources
Environmental Protection Division
2 Martin Luther King Jr. Drive
Suite 1152 East
Atlanta, Georgia 30334

Re: Drought Management Rule – Stakeholder Meeting #2

Dear Mr. Capp

Please accept the following comments into the public record concerning the proposed drought management rule changes as outlined in the meeting conducted by your agency on July 15, 2014:

The City of LaGrange is very much supportive of many efforts to protect the public water supply, and ensure adequate clean water for future generations. We further understand that in times of drought these efforts and subsequently required actions may have to be amended periodically to meet extraordinary situations. However, we do not agree with the proposed methodology of Georgia EPD for several of the proposed rule changes. As the rule changes currently read, the "Director" is given the sole responsibility and control over the declaration of drought in the state. No specific list of indicators has been provided (only general thoughts), nor have numerical targets, ranges, or limits been suggested or established for said indicators. We thoughtfully request that public comment and scientific expertise be sought in the area of drought and climate research to develop specific values that will trigger the levels of drought in both surface and ground water conditions. These requirements should extend to the establishment of the geographic boundaries for the drought declaration as well.

To avoid confusion and the potential for missed reporting, the suggested time period for mandated reporting of non-drought and drought water consumption data should be the same, 14 days. Variable reporting times will only lead to confusion and communication issues in the months that are declared a drought versus the non-drought months.

The drought surcharge program is also a serious concern to the City of LaGrange. Due to the potential for elastic usage of this public utility in the service territory of the city, the Mayor and City Council established policy a number of years ago that automatically adjusts the water fee rate as demand (and consumption) drops. Therefore, the surcharge program proposed by EPD would be redundant to, and in conflict with, the current city ordinance that covers this very set of circumstances. While the help of Georgia EPD is appreciated in ensuring the water system is held in a "cost neutral"

CITY OF LAGRANGE
OFFICE OF THE ECONOMIC DEVELOPMENT DIRECTOR
200 Ridley Avenue • LaGrange, Georgia 30241 • (706) 883-2055 • FAX (706) 883-2020
www.lagrangega.org

position as the proposed drought responses are implemented, the city has already addressed this concern. As an alternative, the agency could suggest the implementation of a system similar to what is in place at the City of LaGrange. We would be pleased to share this information with Georgia EPD.

Being part of a large job-producing region places the city in a unique position of responsibility for the livelihood of many of our citizens and those that reside in the surrounding communities. As such, we continually work to assist our existing industry to resolve issues, while striving to recruit additional jobs to our region of the state. The proposed drought management rules appear to be geared toward large water users without taking into account the amount of water returned to the basin. Our large industrial water users are generally good stewards of this precious natural resource and provide quality water returns to our system. They also do not waste water, as this is a business cost than is closely monitored.

The large industrial users are the life blood of our regional economy, and on a broader scale, Georgia as a whole. For example, several of our local industries account for an increasing percentage of port operations in Savannah. The proposed rules do not give adequate information as to the ultimate impact to their operations, and leave it to "Industry permittee percent reduction determined on a case-by-case basis through permitting process". This is an unacceptable response to a critically important issue and definitely not the words of an industrial recruitment presentation to be sure. This issue alone could easily cause the loss of current jobs, or the elimination of our community for potential future job consideration. Industry recruiters are very judicious in the vetting process for a new industry to locate in a particular community. Any thought of potential service interruption of any kind, or other perceived issue can immediately derail the recruitment process. In the competitive global environment in which we operate, even a hint of a problem is all this is takes to lose out on job growth.

In order to continue to provide tens of thousands of jobs for working Georgians, and to recruit the next companies that will provide the future wave of jobs for our growing population, we must have the certainty of a water and drought management policy in place that ensures employers operational stability in Georgia. As drought management rules are established that could affect industrial users to the point of production curtailment or lay-offs, Georgia EPD must carefully consider the public benefit of all such proposed rule changes.

The economic development staff at the City of LaGrange would very much like to be more closely engaged in this rule-making process. Please contact me directly if we can provide any assistance or insight into this process.

Sincerely,

Mike Criddle
Director, Economic Development

CITY OF LAGRANGE
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P.O. Box 430 • LaGrange, Georgia 30241 • (706) 883-2055 • FAX (706) 883-2020
www.lagrangega.org

Metro District

Cash, Tim

From: Metro Water District Chairman <chairman@northgeorgiawater.com>
Sent: Tuesday, August 19, 2014 4:29 PM
To: Cash, Tim
Subject: Drought Management Rule – Stakeholder Meeting #2
Attachments: District Input on EPD Drought Rule Concepts_July rule.pdf; Zieburtz_drought surcharge letter_August 2014.pdf

Mr. Cash:

Please find attached the Metropolitan North Georgia Water Planning District's input on EPD's draft drought management rule.

The District looks forward to continuing its work with EPD during the development of the draft drought rule.

Thank you for your consideration of these comments.

Sincerely,

Mayor Boyd Austin
District Chair

Metropolitan North Georgia Water Planning District
40 Courtland Street NE | Atlanta, Georgia 30303

James A. Capp
Chief, Watershed Protection Branch, EPD
2 Martin Luther King Jr. Drive, Suite 1152 East
Atlanta, Ga 30334

August, 19 2014

Re: Drought Management Rule – Stakeholder Meeting #2

Dear Mr. Capp:

Thank you for the opportunity to provide input on EPD's draft drought management rule. The Metropolitan North Georgia Water Planning District's (District) member governments and water providers are on the front line of water stewardship and drought management and will be significantly impacted by this rule. We concur that EPD's goal for this rule should be to ensure a modest reduction in water use during times of drought consistent with O.C.G.A. 12-5-8.

EPD should continue its deliberative approach to the development and refinement of the draft drought rule. Based on discussions we've had and letters we have seen to date, we hope EPD will consider a number of refinements to the rule. If this is the case, it would be beneficial if stakeholders had an opportunity to review and comment on the revised draft prior to the DNR Board's consideration and official public comment period.

As detailed below, the District continues (despite the comment deadline's passage) to coordinate and develop a proposed set of drought response strategies that show promise in ensuring a modest reduction in water use during times of drought. The District will provide this additional detail separately and as soon as practicable and sincerely hopes that EPD will entertain and give full consideration to this supplemental substantive input. The District looks forward to continuing its work with EPD during the development of the draft drought rule.

Pre-drought Mitigation Strategies

As noted by a number of utilities in their individual letters on this rule, the most effective pre-drought mitigation strategies include and are based on implementation of broad non-drought water conservation and efficiency measures that serve to sustainably steward water resources and prolong water sources, delaying the effects of drought.

A potential bridge between baseline conservation, efficiency and drought response that has been implemented in other states is a periodic, and continuing, revision to drought contingency plans. As EPD considers this approach, we suggest there may be a role for the Regional Water Planning Councils and District, as appropriate, to incorporate drought contingency planning into their respective regional water planning responsibilities.

Drought Indicators and Triggers

As discussed at the July 15th stakeholder meeting, the District remains concerned about the lack of articulated drought thresholds or triggers. Without this detail, the regulated community lacks the necessary clarity, predictability and notice regarding the implementation of drought restrictions.

We recommend that EPD consider working directly with the National Integrated Drought Information System (NIDIS) to determine which of their products provides the most reliable triggers based on the values leading up to past droughts. It is also advisable to examine past trends in general, as testing for false positives is equally vital when considering drought indicators and triggers. This approach would allow for the calculation of appropriately weighted spatial values for the basin, as looking at single gages or even a simple averaging of a number of gages can be misleading given the region's heterogeneity.

Regarding coordination of information about conditions and implementation of drought restrictions, EPD should consider a coordination role for the Regional Water Planning Councils and District, as appropriate, in the context of their respective regional water planning responsibilities.

Drought Declaration

Several revisions and additions are needed to improve this section of the rule. First, this section should be revised for consistency with Rule Section .04 to allow for a drought declaration to be based on not just on an evaluation of "water supply conditions" but also "climatic indicators." Second, this section should also be revised to allow the Director's consideration of water supplies beyond "affected drought areas." This is important because of basin interconnections; a drought in one part of the state might affect the water supplies in another basin even if it is not officially an "affected drought area" for purposes of the rule. For example, a drought declared in the Flint basin would impact Lake Lanier and therefore could affect utilities in the Chattahoochee basin. Additionally, and as discussed in our June 3rd letter, equally important to a sound drought declaration process is a transparent and systematic process for declaring an end to a drought and its associated restrictions. EPD should develop and include a provision to this end in the rule.

Drought Response Committee

As we highlighted in our June 3rd letter, this section of the rule presents an ideal opportunity to provide necessary clarity and notice to the regulated community regarding implementation of the strategies required by the rule. The current lack of a requirement to consult with any specific entity, much less local water providers, puts the Director at risk of missing an opportunity to systematically coordinate with those who have first hand, on the ground information. At a minimum, the rule should clarify who sits on the committee, why and when the Director would convene the committee, and the role the

committee's advice would play in the implementation of any of the strategies required by the rule. Given this continuing concern and that the current draft rule did not reflect original stakeholder input, EPD should include this as a topic for further discussion with stakeholders prior to finalizing the proposed rule and submitting it to the DNR Board.

Record Keeping and Reporting

As recommended in our June 3rd letter, the rule should recognize, use and build on the existing body of information prior to establishing new record keeping and reporting requirements. As recommended in Cobb County Water System's August 14th letter on this draft rule, EPD should examine current reporting requirements, make any needed changes to those reports and incorporate the draft water use and efficiency reporting guidance currently being tested by GAEPD and several utilities. This approach is likely to provide data that can be more readily utilized in determining how water systems are being managed and better estimate the current impact on the resource. Furthermore, if in fact, as discussed below, the rule's percentage water use reductions are not mandated requirements, but are actually aspirational targets, the purpose underlying the burden associated with this recordkeeping and reporting exercise should be clearly articulated in the rule.

Drought Response Strategies

- Drought response levels

The drought response levels as drafted are essentially the same and will likely not result in meaningful curtailment of water use, thus accelerating the Level III declaration. EPD should redraft the levels and associated responses into more distinct steps. A more sequenced approach should also recognize the expected behavioral response (and water use reduction) lag associated with the implementation of more restrictive drought response strategies.

- Numeric water use reductions

Given EPD's goal that the rule ensure a modest reduction in water use during times of drought, the rationale for limiting water use reduction requirements to only those permittees who are public water systems and whose monthly average water use is one million gallons per day needs clarification. The rationale for deciding that a vast amount of water use should not be subject to a statewide drought rule should be documented in the rule to bolster an otherwise potentially arbitrary distinction that places the burden of achieving EPD's ends on a small proportion of water systems.

Equally unclear is EPD's intent regarding the role of wholesale suppliers in achieving required numeric water use reductions. The draft monthly reporting form provides no clarity as to intent and only magnifies this problem. This is particularly evident in situations where a wholesaler might be left to require a single industrial client to generate the required water use reductions once sales to retail suppliers are accounted for (per the form's instructions). Given the unintended economic development consequences, EPD should consider exempting water providers whose business profile is primarily wholesale and industrial use. Please refer to Cobb County-Marietta Water Authority's specific comments regarding this issue.

Aside from inappropriately requiring selected systems to shoulder the burden of achieving EPD's ends, the concept of water use reduction requirements as drafted needs clarification and refinement. This rule section states that systems, "shall achieve a 10% reduction in monthly average water use." However in both the subsection's title and later in the rule, this concept is referred to as "Numeric Water Usage Reduction Targets" and a "water use reduction target," respectively. In the stakeholder meetings we have understood EPD to convey that the reductions are not intended as mandated requirements, but much more akin to aspirational targets. If this is the case, 1) "water use reduction target" should be defined either in .02 or within the context of .08 to clarify intent, 2) the word "shall" needs to be deleted every time a reduction is discussed, and 3) every time a reduction is discussed, it needs to be accompanied by the (defined) phrase "water use reduction target."

Finally, the "supply and demand" analysis provisions needs refinement. The driver for any demand reduction targets should be the probability of meeting demand with some specified level of certainty. How full a reservoir is has no direct bearing on how much water supply is available without considering what the actual need may be. For example, whether a reservoir is 50% full or 75% full has no bearing on water availability without looking at the volume of water in the reservoir versus the expected daily usage from that reservoir. There is no way to determine the amount of daily water supply remaining merely from the percent a reservoir is full. At a minimum, EPD should include the use of appropriate forecasting techniques as part of this analysis.

- Baseline

As raised in our June 3rd letter, the District is concerned with the water use baseline as presented. It continues to appear that the current concept may be better suited for consideration in context of a water conservation rule. Additionally, the term baseline is only used in reference to what surcharge rates are designed to achieve. From a drafting perspective, this may become an issue if the surcharge section is significantly revised or removed entirely. It is also unclear why this term is not also used when describing the time period permittees are to reference when determining water use reductions.

Aside from the inconsistency in how this section is drafted, and as outlined in our June 3rd letter, the use of the specified six-month period of the year immediately preceding the declared drought to establish the baseline for water use reductions remains problematic. We agree with Cobb County Water System that utilizing a baseline that reflects current conditions is not an accurate representation of water use because use has not rebounded from the drought or the economic slowdown. As they provided in their August 14th letter, a fixed baseline reflective of wet and dry years appropriately considers the strides made by parts of the state on conservation.

Instead of using the baseline as drafted, EPD should consider making use of the draft water use and efficiency reporting guidance being prepared in the context of the conservation rule making. For purposes of the drought rule, the associated baseline formula could be used to set a realistic baseline - one that could easily be used by utilities that are further down the efficiency path when setting base reductions. This would have the important effect of lessening the anticipated impact of demand hardening thereby avoiding punishing those systems who have invested in efficiency.

Given this continuing concern and that the current draft rule did not reflect original stakeholder input, EPD should include this as a topic for further discussion with stakeholders prior to a decision as to whether or not to include it in the proposed rule submitted to the DNR Board.

- Adjustment of water use reductions based on water loss audit results

As we stated in our June 3rd letter, EPD's concept for using the water loss audits in a drought management context is problematic. While the audits represent a promising approach to providing systems a new tool for understanding system efficiency, there are significant limitations to using the audits in this context, primarily because they were not designed to inform the degree of temporary reductions a system should implement during a drought. We remain concerned about EPD's ex-post facto adaptation of the audits results for this new purpose. At a minimum, this topic should be further discussed between EPD and stakeholders prior to a decision as to whether or not to include it in the proposed rule submitted to the DNR Board.

- Drought Surcharges

In light of significant concerns regarding the rule's drought surcharge language, the District commissioned an analysis to assist the District, our member utilities, and EPD with better understanding the role and effectiveness of drought surcharges as a drought response strategy. Among the conclusions detailed in the attached letter prepared by Bill Zieburtz, a principal author of several chapters of AWWA's M1 Manual, Principles of Water Rates, Fees, and Charges, is that state mandated surcharges are not always effective and can yield negative unintended consequences, particularly for systems such as those in the District with tiered conservation rate structures.

As detailed in the attached letter, the difficulties associated with successfully implementing a state mandated drought surcharge stem from the complexities of demand management, including demand inelasticity and assumptions regarding the uniformity of the ability to curtail demand. Additionally, the potential for inequitable cost allocations, confusing customer messaging, non-neutral impacts on revenue generation, and billing system risks and costs also play a role in undermining the effectiveness of state mandated drought surcharges. Please see the attached letter for specifics on each of these topics. Consistent with the incorporation of Mr. Zieburtz's letter into the District's comments, we wish to highlight a few of his key points here.

As Mr. Zieburtz's explains, one of the unintended consequences associated with mandating drought surcharges for systems with tiered conservation rate structures is the risk of undermining a system's financial stability. For these systems it is a very real possibility that in times of drought the customer behavioral response not only avoids the drought surcharge, but also yields a further reduction of water use beyond intended targets. When this occurs, neither the anticipated revenue of the inclining rate structure nor the surcharge are realized. The impact of this loss of revenue to the system can be profound and could force the adoption of emergency "across the board" rate increases – a result clearly not in keeping with EPD's stated intent for this rule.

Additionally, Mr. Zieburtz's discussion of the relative inelasticity of water pricing and his point that large and very visible rate changes are required to obtain reductions in consumption further demonstrate the difficulty with implementing state mandated drought surcharges. The draft rule requires that systems develop and implement a "surcharge rate consistent with a [given] percentage water use reduction." The rule contemplates water use reductions between 5% and 15% depending on the drought level and season. As discussed in the attached letter, given a reasonable estimate of price inelasticity, it is likely that rate increases of 50% are needed to obtain a 10% reduction in water use. This level of price increase is not trivial, especially in the District where conservation rates and measures are already in place. We are concerned that without further contemplation of the surcharge concept, EPD may inadvertently mandate massive rate increases when other drought response strategies could be employed to similar effect.

Finally, as other commenters have noted, the rule's language sets up a potential conflict. The draft provides the surcharge shall be "consistent with" achieving a 5 or 10% reduction. It also states it shall be approximately revenue neutral. If the concept of a surcharge is retained at all, EPD needs to clarify the intent in light of the possible implementation of surcharges required to achieve reductions that turn out to not be revenue neutral.

Because surcharges are useful for some utilities in some circumstances, but can be a very negative option for others, EPD should remove this provision from the draft rule, or at a minimum clarify EPD's intent and identify drought surcharges as a non- mandatory option among other drought response strategies.

- Effective drought response strategies

As we stated in our June 3rd letter, the most effective drought response strategies are based on local system flexibility in the context of a set of state preferred approaches. Given the inability for drought surcharges to ensure a modest reduction in water use during times of drought, the District continues to coordinate and develop a set of drought response strategies that show promise in ensuring a modest reduction in water use during times of drought. This set of strategies, cognizant of a water system's specific circumstances, is being developed from a perspective of what can be done, rather than what arbitrary percentage of water use reduction must be achieved by a select few. The District will provide this additional detail separately and as soon as practicable and sincerely hopes that EPD will entertain and give full consideration to this supplemental substantive input.

Variance Requests

This section of the rule also needs significant revision and clarification. For example, rule section .09 (5)'s provision that variances won't be granted is ambiguous regarding EPD's intent and therefore needs to be redrafted.

More problematic is rule section .09 (6), which suffers from a number of issues including ambiguity regarding intent as well as inconsistency with the enabling legislation. First, clarification is needed as to which restrictions are the subject of this section. As written, this section's implicitly broad application of

the word "restrictions" is ambiguous in light of the statute's narrow specificity regarding "...no statutory outdoor watering..." At a minimum we recommend hewing closely to the statute.

Furthermore, the rule's prohibition that systems who rely on water from Corps projects may not apply for a variance needs to be removed. O.C.G.A. 12-5-7 (b) provides that "any political subdivision of this state or local government authority may apply..." for a variance. As written, the rule removes this important statutory procedural assurance thereby disqualifying a system from even attempting to seek a variance. The creation of this "disqualified" new sub-class of permittees creates real-world problems and presumably unintended consequences for "permittees whose water supply is obtained in... part from..." projects operated by the Corps. For example, as written, systems who obtain an extremely small part of their water supply from a Corps project are disqualified from seeking a variance from "restrictions" that are less stringent than those described in the Rule. Including these types of systems in EPD's new sub-class makes even less sense when one considers the investments some have made in drought contingency projects. Given the significant issues with .09 (6), EPD should strike this section of the rule.

Again, we appreciate your consideration of these comments. As noted at the outset, EPD should continue to meaningfully engage stakeholders in the development and refinement of the draft drought rule before providing the proposed rule to the DNR Board. The District looks forward to continuing its work with EPD during the development of the draft drought rule, particularly on drought response strategies which, as noted above, will follow under separate cover.

Sincerely,

Mayor Boyd Austin
District Chair

Katherine Zitsch, PE, BCEE
District Manager

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August 19, 2014

Katherine Zitsch, PE, BCEE
Natural Resources Division Manager
Atlanta Regional Commission
Metro North Georgia Water Planning District
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Atlanta, Georgia 30303-2538
404-463-3255

Dear Katherine,

This letter is in response to your request for information and perspective on the use of drought surcharges and some of the potential implications for utilities in the Metropolitan North Georgia Water Planning District. I understand that Georgia EPD's draft drought rule contemplates a requirement for implementation of drought surcharges consistent with achieving a given percentage water use reduction, and that there is an opportunity to dialog with EPD on this and other measures.

This letter provides my perspective on drought surcharges, reflecting my experience as a municipal utility rate analyst in Georgia and throughout the country since 1986. I'm experienced in these matters, and am immediate past chair of AWWA's Rates and Charges Committee, the principal author of several chapters of M-1, and I personally reviewed and provided comments on every chapter in the current edition of the manual.

These comments are relatively brief, attempting to spare you a treatise on conservation rates, rate setting, or drought management, and I've not attempted to provide any "how to" instructions or recommendations as to potentially effective demand management strategies. Instead, these are comments on the specific question of the potential risks of a requirement that utilities adopt a drought surcharge consistent with achieving a given percentage water use reduction according to defined drought levels in Georgia.

INTRODUCTION

Water utilities within the District employ a wide variety of rate structures to recover their costs of providing service. Even with the degree of consistency provided by District requirements regarding conservation rates, wide variations in terminology, in reliance on base and volumetric charges, and in the structure of rate blocks are so significant that it is often hard for water professionals to compare rates and rate implications to end-users. Further, demand management is intrinsically complex. Other than concrete measures such as changing fixtures, it is non-mechanical and non-linear, and even when success is attained, it is often unreproducible.

I believe that the inherent variability among utilities and complexity of demand management, combined with comparable variability in local operational, policy, billing, and communications procedures would make it very difficult for a required drought surcharge to have a net positive effect. Some of the key reasons for my conclusions follow.

Inelastic demand

Rates and charges have an important supporting role in well-crafted demand management strategies. Yet extensive water industry discussions regarding successes related to conservation pricing and industry-wide rate increases well

above the rate of inflation for the last 15 years notwithstanding, the price elasticity of the demand for water is low by comparison to most goods and services. Water is an excellent example of a product for which demand is inelastic. This fundamental truth reflects the obvious necessity of water in a very real sense. One implication is that comparatively large and very visible changes to rates are required to obtain reductions in consumption. This simple fact raises the risks for a water utility because a drought surcharge large enough to work must have both actual and perceived impacts on customers. Many of the risks and concerns identified below arise from this fundamental fact.

Assumed uniformity of the ability to curtail demand

A statewide policy requiring a specific percentage reduction in demand for all public water suppliers reflects an incorrect implicit assumption: that all systems are similarly capable of obtaining comparable reductions in demand. A cursory examination of consumption data from very few systems would demonstrate the fallacy of this assumption, with wide variation in per-capita demands reflecting both business and industrial usage, as well as significant variability in residential consumption patterns. A community with an ongoing commitment to water conservation simply does not have the same ability to curtail demand as a community where conservation has not been a long standing priority. Utilities having previously invested in conservation education, policy development, and elaborate rate analysis will have influenced customers to make changes in advance of the next drought. A set statewide requirement of a given percentage reduction would necessarily require such systems to undertake draconian steps to achieve required drought-related demand reductions, while other systems would be able to implement minor changes and programs to achieve the same result. Extreme measures are required to respond to extreme conditions, but it is only in response to extreme local conditions that the benefits of extreme pricing measures are likely to outweigh the costs.

Interaction with tiered rates

Drought surcharge programs are not a new idea, having been originally conceived in the days when declining block and uniform unit charges were the most common rate structures. Because declining blocks were generally structured to isolate customer classes, in both cases customers generally faced a consistent unit charge regardless of the amount of their consumption. As such, consumers made their consumption decisions in a simple environment, and the addition of a drought surcharge offered an observable and understandable change to which they were able to respond. The water rate environment of the past was also a very stable one, with rate changes being infrequent by modern standards, so a drought driven surcharge was a noticeable event to customers.

Modern water pricing practices and patterns reflect a different situation. Increasing block rates (tiered rates) are now required in the District and are common throughout Georgia; as a result, rate schedules are interacting with consumer decisions in a more elaborate fashion than was previously the case. Tiered rate structures have already been successful in encouraging customers to change their behavior and reduce discretionary consumption on a regular basis. One result, in essence, is that the customer base for many District utilities has aligned itself into subsets reflecting different usage patterns. The segmenting of the price and program responsive customers and other low-end users from the non-responsive higher-consuming customers results in the risk that a drought surcharge could possibly create potentially punitive situations or undesired customer perception effects.

Some of the risks are more fully addressed below, but one dilemma should suffice to make this point: An "across the board" surcharge increasing all volumetric rate components equally would come at the risk of undue financial burden to highly conservation conscious and other low consumption customers. A drought surcharge of sufficient magnitude to impact consumption would necessarily create

large perceived budget impacts and disproportionate impacts on the part of some of these low-consuming customers, and as such would be a politically difficult and potentially economically inequitable change. The obvious alternative, a surcharge applied only to higher-end usage, targeting the presumably larger proportion of discretionary consumption comes combined with risk: the significant potential of creating a much larger than expected reduction in revenues than planned. Should a significant portion of high-end consumers, or even a significant individual customer be motivated to make a reduction in consumption, their change could be much larger than a 10% to 15% reduction that might be desired. In that case, not only would the drought surcharge fail to produce any offsetting revenues, the reduction in revenues from higher tier, (and hence, higher rate), usage would create a disproportionately large financial impact on the utility. In the case of increases large enough to engender the desired levels of reduction in demand, this strategy could very well force some utilities to adopt an emergency "across the board" rate increase further impacting all levels of consumption. Rate increases such as this, following quickly on the heels of a prior and visible change are especially damaging of public trust and engagement.

The potential for individual impacts

Water utilities understand the multitude of uses for water, but they do not know which uses any customer or group of customers is satisfying at any given time. So discretionary uses, to which conservation and drought related measures are most appropriately applied, are only estimated in a general sense by customer class. This class aggregation conceals both the ability to conserve and the potential economic impact on customers.

The economically disadvantaged water customers of a system with effective pre-drought conservation strategies are particularly at risk if mandatory drought surcharges are implemented. In part, this is because utilities with effective pre-drought conservation programs tend to have effective price signals built into their

rate structures already. The Environmental Finance Center's Georgia Rates Dashboard prepared for GEFA, indicates that residential water and sewer bills in the District for 5,000 gallons of consumption ranged from approximately $24 to $122 in 2013. Virtually every community, regardless of its overall level of prosperity has an economically disadvantaged members. Yet very few utilities have been able to implement meaningful "affordability" programs, and almost no utilities have information on customer income or wealth. The lack of programs and data, combined with legal constraints regarding cross subsidization, mean that almost no utility would be able to implement a meaningful drought surcharge without disproportionately impacting its poorer customers.

Price elasticity estimates for water are wide ranging, with many results ranging from -.05 to -.75, but with a concentration of results around -.2. Acknowledging that a single data point is of limited usefulness, but assuming price elasticity of for this purpose, -.2, it would take a 25% price increase to obtain a 5% reduction and a 50% price increase to obtain a 10% reduction. One of the many variations in methods used in elasticity studies is to focus either on marginal pricing or average cost pricing, so mixing broad, aggregated figures is only illustrative, not conclusive. Still, for purposes of exposition, it is useful to acknowledge that a meaningful drought surcharge could easily result in a monthly bill increase of $25 to $50 (assuming a representative pre-drought bill of $100).

Monthly budget impacts of $25 or $50 can represent a material problem for some low income households, and again, it is a very rare utility that has any program or procedure in place to mitigate such impacts based on financial need. Some expressions of affordability issues are overstated, and anxiety over nominal rate increases is often misplaced. But impacts of the magnitude we are contemplating are potentially significant at the household level.

Adding political risk to what is more fundamentally a socio-economic concern is the potential for unintended consequences on the opposite end of the consumption

scale. Some more prosperous, or just higher-consuming consumers would be able to curtail discretionary uses to a significant degree in the face of a drought surcharge large enough to obtain the desired level of demand reduction. Consumers reacting to the large drought driven rate increase could quite possibly receive monthly bills lower during a drought than before. This risk is not unique to a drought surcharge, but it is a real risk for utility managers and reaffirms the benefit of thorough system-specific demand analysis and rate planning.

Impacts on customer understanding

Changes in rate structures and rates themselves have the potential to confuse customers and reduce the effectiveness of pricing strategies. It is literally possible to introduce a rate or rate structure change with the intention of reducing demand, and have the opposite result if customers become disengaged or less trustful of the utility. The perception of the integrity of the utility and belief in its objectives and initiatives has a significant impact on customer willingness to respond positively to utility messaging. Since conservation successes are so largely dependent on customer buy-in to the need for behavioral change, many utilities are very cautious about irregular rate adjustments, recognizing that a consistent message is an important part of demonstrating stability and competence.

Billing system complexities

A required drought surcharge will require staff time of every utility and create the potential for errors in billing. Because obvious errors and mistakes are infrequent, water professionals who do not interact with billing system personnel tend to dramatically underestimate the complexity involved. Unfortunately, billing system resilience and flexibility is not common, and a key reason that publicly visible problems are infrequent is that most billing systems are subject to infrequent change. Because local government utilities typically operate under a "hand me down" set of policies and procedures, with local conditions, situations, and areas of

concern that are literally unique, they have to accommodate a dizzying array of special conditions in their billing systems.

It isn't that a drought surcharge requires uniquely complex concepts to manage, but moving from conceptual work to concrete work requires careful analysis and respect for local situations. The required work is analogous to an engineering study, but some utilities are less likely to grasp the risks and complexity of this issue and encounter very visible billing errors.

Revenue neutral objective

The draft language instructs utilities to adopt revenue neutral drought surcharges, compensating utilities for the reduction in water sales while not providing any material increase or decrease in revenues overall. While conceptually simple, revenue neutrality is notoriously difficult to achieve in the real world.

The first significant challenge is weather. Pricing must be done in advance, but weather is only knowable in hindsight. Utilities are accustomed to working through wet and dry periods, and over the span of several years, most utilities are able to align revenues, costs, and usage, to balance their budgets. It is not possible to change rates during a drought and assure that the change will be anywhere near revenue neutral, except on paper with projected figures.

Second, most District water utilities issue bills on a monthly basis. By the time a monthly bill reaches the hands of a consumer, the consumption in question is generally a minimum of two weeks in the past, making the connection between a surcharge driven increase and last month's behavior hard for consumers to discern. It isn't that pricing doesn't play an important role in influencing conservation behaviors, but it is important to recognize that changes in pricing and rate structures are not able to induce a mechanical, consistent response from consumers.

Third, while economists and other water professionals discuss the price elasticity of the demand for water extensively, customer behavior is strikingly inconsistent across differences in price, time, geography, income levels, and cultural norms. The elasticity response within a single utility varies widely between neighborhoods and from year to year, and as a result, predicting the impact of a price change on customer behavior is much more difficult than is often assumed, even by the utility professionals involved. Further, note that this comment presumes a well-functioning, well-staffed, well-funded utility, with a commitment to demand analysis and management. Even within the District, not every utility has been able to make this commitment and level of investment.

Fourth, even in cases where utilities have made unusually large investments in customer and demand analysis, elasticity estimates are constrained in their usefulness by the limitations of the conditions under which they were derived. Specifically, a utility with an understanding of what a specific customer group has done in response to price changes is still in possession of an insufficient predictor of their future response to different price changes. It isn't just that consumer preferences and options can change over time – it is that consumers react differently to a change from, say $2.00 to $2.50 than they do to a change from $2.50 to $3.00. From a consumer's perspective, it doesn't matter that each change was the same at $0.50 per unit, because they've been impacted at a different point on their personal demand curve, so they react differently. As such, utilizing even locally derived elasticity estimates at one price level could easily result in significant over- or under-estimates of the impact on demand.

As a result, and exacerbating the situation, any statement, law, regulation, or instruction from the state indicating that drought surcharges should be revenue neutral runs the risk of providing material for use by disgruntled parties in attempts either to obtain water restriction or rate concessions for themselves, or to defame and diminish the utility or local government generally.

Costs to local government utilities

A required drought surcharge will result in significant cost impacts to some local government utilities. The costs would be faced by those utilities who turn to outside entities for the management of their billing systems. This situation is not uncommon, with as many as 50% of smaller systems working either with billing system companies who charge for every modification of a rate structure or billing procedure, or with outside IT professionals who come in as needed to make adjustments.

Summary

Drought surcharges are a potentially useful strategy for utilities facing a short term curtailment of supply, as described in Chapter V.3 of AWWA's M-1 Manual (Drought and Surcharge Rates). Every rate strategy involves complexities and unique requirements reflecting specific local conditions, and some of the ones associated with drought surcharges are mentioned in pages V.3 - 5 through V.3 - 11 of the manual. The chapter's list of surcharge options (general rate adjustment, general volumetric surcharge, class-based volumetric surcharges, individualized volumetric surcharge, and targeted volumetric surcharge levels) hints at some of the structural considerations utility managers need to consider. The following sections on surcharge policy issues, (drought management plan, timing for implementation of drought surcharges, revenue sufficiency, additional and/or deferred expenses, equity, bill presentation and accounting issues, customer acceptance, media relations, and removal of drought pricing), suggest some of the analytical and policy issues that need to be resolved.

The point of that recitation is not that these issues cannot be resolved in many cases, but to emphasize that each issue must be resolved according to the specific local conditions and circumstances faced by each individual utility, and to state that this single solution is not a good fit for every utility facing drought conditions. Drought

surcharges are useful for some utilities in some circumstances, but that they can actually be a very negative option for others. Utilities with effective tiered rates and other conservation programs (such as the utilities in the District) would seem to be unlikely candidates for drought surcharges because of the potential for inequitable cost allocations, confusing customer messaging, non-neutral impacts on revenue generation, and billing system risks and costs.

I hope that these brief comments are of use. Please do not hesitate to call if I can be of any further assistance.

Warm regards,

William B. Zieburtz, Jr.

Oglethorpe Power

Cash, Tim

From: Fulle, Doug <doug.fulle@opc.com>
Sent: Tuesday, August 19, 2014 3:23 PM
To: Cash, Tim
Cc: Averett, Lindsay; Price, Mike; Whitney, Chuck; Robbins, Clay; Mitchell, Clarence; Casey F Bradford (cbradford@jonesday.com); Hairston, Robin; Yarbrough, Deniece
Subject: Comments on Drought Management Rule - Stakeholder Meeting #2
Attachments: 140819 Drought Management Rule letter to EPD 8 19 14.pdf

Tim:

Attached are the comments of Oglethorpe Power Corporation on the subject issue. Please call me with any questions.

Doug

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OglethorpePower
An Electric Membership Corporation

August 19, 2014

Mr. James A. Capp
Chief, Watershed Protection Branch
Georgia Environmental Protection Division (EPD)
2 Martin Luther King Jr. Drive, Suite 1152 East
Atlanta, GA 30334

Delivered via email and US mail to:
tim.cash@dnr.state.ga.us

Subject: Drought Management Rule – Stakeholder Meeting #2

Dear Mr. Capp:

Oglethorpe Power respectfully submits these comments in response to EPD's stakeholder meeting on July 15, 2014 regarding the possible development of a new Drought Management Rule. While we appreciate the opportunity to comment on EPD's unofficial Stakeholder Draft Rule for Drought Management ("Draft Rule"), we urge EPD to work with a broad stakeholder group to develop new language as the basis for any official proposed rule. We are especially concerned that the unofficial Draft Rule is unnecessary and infeasible as it relates to industrial water use permittees. Oglethorpe Power welcomes the opportunity for continued dialogue with EPD on the development of proposed rule language.

I. EPD should continue to rely on the existing drought planning system for industrial water permittees.

EPD is considering new drought management rules, in relevant part, to address O.C.G.A. § 12-5-8 (effective May 14, 2008), which calls for rules on pre-drought mitigation and drought response. While EPD currently lacks regulations on some of the elements outlined in O.C.G.A. § 12-5-8, such as drought response committees and a drought declaration process, the existing water permitting regulations already require drought mitigation and response strategies for industrial permittees like Oglethorpe Power. We appreciate EPD's attempt to acknowledge the existing drought planning system for industrial permittees in the unofficial Draft Rules, as well as EPD's intent to avoid new regulations that would require industrial permittees to curtail their operations or lay off employees. However, we believe that no new requirements are necessary or appropriate for industrial permittees for the following reasons:

- The existing surface and ground water permitting regulations already incorporate long-term planning for drought mitigation through implementation of the Comprehensive Statewide Water Management Plan ("State Water Plan"). Pursuant to the State Water Plan, each regional water planning council develops a Regional Water Plan to estimate

the current and future water needs of the region, and to outline management practices necessary to meet the region's water needs. In early 2009, the Department of Natural Resources adopted Georgia Rule 391-3-6-.25 and Georgia Rule 391-3-2-.16, requiring EPD to consider Regional Water Plans when issuing surface and ground water permits. Through Regional Water Plans, EPD already considers long-term planning for drought mitigation and avoidance when issuing surface and ground water permits.

- EPD's existing surface and ground water permitting regulations also require significant drought response planning by individual non-farm permittees. Drought contingency plans are a required part of any surface water permit application for a non-farm use, and such plans address significant planning features like drought condition indicators, low flow protection, and water storage availability. Ga. Rule 391-3-6-.07(4) (b) 9. In addition, water conservation plans are required for new or modified ground or surface water permit applications (except farm use applications) which request an increase in the permitted water use. Ga. Rule 391-3-6-.07(4) (b) 8; Ga. Rule 391-3-2-.04(11). Water conservation plans call for a number of significant planning measures, including drought contingency plans, submission of annual water use data to EPD, and five-year progress reports on water conservation efforts.

- Built-in economic pressures for industrial facilities have led to improvements in baseline water efficiency and reductions in water use, to the point where many permittees have little or no ability to reduce their water use further without curtailing operations. In fact, many facilities recycle or return much of the water they use to surface waters, which means that actual consumptive water use is low, and there may be no way to reduce consumptive use further without serious economic or operational impacts. For example, at the Rocky Mountain Pumped Storage Hydroelectric Plant ("Rocky"), Oglethorpe Power impounds water into a lower reservoir and then pumps it to an upper reservoir, from which water is released back down to the lower reservoir to generate electricity. This process is used daily to generate power that replaces higher priced or, in periods of extreme demand, potentially unavailable peaking generation. Although surface water is critical to Rocky's operation, the plant actually consumes no water except for water which is lost to evaporation. Rocky has a water conservation plan and a drought contingency plan outlining measures to be undertaken during drought. For the most part, however, Rocky is unable to reduce its relatively small amount of consumptive water use without curtailing operation. The plant impounds only the amount of water needed to fully utilize its power generation capability. Reducing water use below those levels would restrict a largely non-consumptive use and would only require the replacement of the lost power from another facility, which may consume more water than Rocky. During the 2007-2008 drought, EPD initially requested that Rocky comply with a uniform 10% water use reduction requirement, but later withdrew its request based on these considerations.

- A new obligation for industrial permittees to assign a *numeric* water use reduction to measures outlined in their drought plans, as described in Draft Rule 391-3-2-.04(11)(d)(i) and Draft Rule 391-3-6-.07(4)(b)9.(i), would be infeasible in most cases.

> Here again, Rocky provides a useful example. In 2007 and 2008, Oglethorpe Power implemented a number of water conservation measures at the plant in consultation with the Department of Natural Resources' Wildlife Resources Division, which manages the recreational areas at Rocky. These measures included closing the group campground, three recreation area buildings, and the vehicle maintenance facility car wash station, as well as posting water conservation signs in plant restrooms and requesting further conservation suggestions from the Floyd County Water Department. Despite these efforts, the plant did not see a significant decrease in on-site water use, likely due to an increase in manpower and potable water demand as a result of critical maintenance activities during the same time frame.

Going forward, EPD should continue to rely on the drought contingency planning system that is already in place for industrial water users under the existing permitting regulations. The existing system already requires industrial permittees to identify and implement, on a case-by-case basis, *measures* that can reasonably be implemented during times of severe drought to reduce consumptive water use without curtailing operations. Rocky's experience during the 2007-2008 drought illustrates the difficulty of predicting a *numeric* water use reduction to be achieved from a list of water conservation measures under hypothetical conditions, especially where baseline consumptive water use is already low. A better approach is for permit applicants to continue identifying the *measures* that can be implemented during times of severe drought to reduce water use without curtailing operation under their individual drought plans. Once those measures are actually being implemented, permittees could accurately quantify the resulting water use reductions under the circumstances presented.

II. Only systems that *sell* piped water to the public for human consumption should be regulated as public water systems.

Draft Rule 391-3-30-.02 would define "public water system" as "a system for the provision to the public of piped water for human consumption." However, the requirements for public water systems in the Draft Rule are actually targeted to municipal public water systems, or systems that *sell* piped water for human consumption. *See* Draft Rule 391-3-30-.08(3) (d) (calling for public water systems to implement drought surcharge *pricing*). To clearly exclude industrial facilities that hold drinking water permits for on-site use, any official proposed drought management rule should limit requirements for public water systems to systems that *sell* piped water to the public for human consumption.

III. EPD's process for declaring droughts should be flexible but should give all affected permittees an opportunity to comment.

Oglethorpe Power supports giving EPD significant flexibility under the rules to declare droughts according to certain geographic boundaries, surface waters, ground waters, or other features. The 2006 – 2009 droughts in Georgia demonstrated that a drought assessment and declaration process needs to be flexible and targeted toward the specific conditions presented in order to lay the groundwork for timely and efficient drought response. Inflexible drought response mechanisms will lead to overly costly, burdensome, and ineffective response. At the same time,

however, permittees within a proposed drought area must have an opportunity to submit comments on a proposed drought declaration. In drafting an official proposed rule for drought management, EPD should clearly provide an opportunity for public comment on drought declarations by all affected permittees.

IV. Conclusion

Oglethorpe Power appreciates the opportunity to comment on EPD's stakeholder process for drought management rules. If you have any questions about these comments, please do not hesitate to contact me at 770-270-7166 or contact Lindsay Averett at 770-270-7298.

Sincerely,

Douglas J. Fulle
Vice President, Environmental Affairs

cc: M. Price (OPC)
C. Whitney (OPC)
C. Robbins (OPC)
C. Mitchell (OPC)
C. Bradford (Jones Day)
Comments File

Ron Rogers

Cash, Tim

From: Rogers, Ron <Ron.Rogers@waynefarms.com>
Sent: Tuesday, August 05, 2014 1:16 PM
To: Cash, Tim
Cc: Dickson, Russ
Subject: Question on Drought Mgt. rules

As an industrial ground water permit holder whose permit is for over one million gallons per day, but use less than one million gallons per day, would you have to follow the Level 3 numerical water usage reduction targets?

Thanks,

Ronald Rogers
Wayne Farms LLC
Complex Manager, Pendergrass Ga.

Tim Thoms

Cash, Tim

From: Tim Thoms <tim@thomstrees.com>
Sent: Tuesday, August 19, 2014 3:59 PM
To: Cash, Tim
Subject: Drought Management Rule-Stakeholder Meeting #2
Attachments: Comments for Consideration on the Drought Management Rule Tim Thoms 8-19-14.docx

Dear Mr. Cash:

Following and included as an attachment are my personal comments on the DMR as currently presented.

I can be reached at any of the included contacts.

Comments for Consideration on the Drought Management Rules

August 19, 2014

Tim Thoms, Thoms Trees and Plants, Inc.
tim@thomstrees.com 770-461-6013

I appreciate the opportunity to comment prior to the development of an Updated Drought Management Rule and for the opportunity to attend the July 15, 2014 Drought Management Rule Stakeholder Meeting. The DMR is, without a doubt, a significant regulation that severely impacted my company in the past. I hope that the effects from a new DMR can be more equitably distributed across all water use segments. I is also my hope that these concerns are addressed in any DMR outcome.

I understand this is a complicated issue. As was apparent from the July 15 meeting, the process used to develop the DMR is important for acceptance and consensus among those whom the DMR significantly affects. Experience tells us it is important that any DMR considerations involve stakeholders in the process. There are many qualified and knowledgeable experts from the green industry as well as other segments of water users such as local government, hospitality, construction, energy, agriculture, manufacturing, education, etc., that can work in concert with EPD to develop a draft DMR that is effective, equitable and efficient. This can then be circulated for wider comments, and having already been vetted by knowledgeable stakeholders, be more readily acceptable to affected parties and reflect accurate information regarding items such as efficient irrigation and surcharge billing capabilities.

Having now seen a strawman DMR, I offer the following comments in addition to the above suggestion to incorporate a panel of experts to work with EPD on development of this rule.

1. The communication channel between EPD and stakeholders needs to be open and effective. Much improvement was made in communicating the opportunity to attend this meeting as represented by the packed meeting room. However, there appear to be some stakeholder segments that were still not in attendance at the meeting and may be unaware of the new DMR development. In addition we know of others who did not get email notification that had signed up on the list to receive such.

2. As stated previously, any DMR must take into economic considerations so as to not devastate any one industry as it did in the past. EPD even states this in the last two pages of the rule in relation to permittees who are not municipalities, **"(I) The numeric water usage reduction target shall be determined on a case-by-case basis and shall be based on reasonable temporary measures that the applicant or permittee can implement without having to curtail operations or lay off employees."** This should be true for any water user segment as well regarding any aspect of the DMR. Any rule must allow for shared consequences among all water users while achieving the goal of water

savings. The brunt cost in jobs, production, revenues and even business failures cannot be borne by one segment alone such as the green industry.

4. The exemptions in the Water Stewardship Act as outlined in 12-5-7 are there as statutory law and cannot be ignored or modified without creating new law. I stand by my opinion, and believe it to be legally enforceable, that these are not discretional by regulatory agencies such as EPD.

3. Beyond the fact that it is not legal to alter the exemptions, the restrictions on exemptions in paragraph (b) of Drought Level 2 penalize previous investments in efficient irrigation that many horticulture professionals have put in place over the last several years. Rules should reward efficient use of water that are already in place due to previous efforts to install conservation methods. Efficiencies such as drip irrigation, recycling water for evaporative coolers in institutional settings, or using waterless urinals should be credited to such users allowing them to meet less stringent criteria or go further into drought level reductions than those not using such efficiencies. Your own statement in 391-3-30-.03(2) reinforces this point **"(2) The state has already made, and continues to make, extensive investments in water efficiency since conservation measures play such an important role in water stewardship. Therefore, with the exception of the outdoor irrigation requirements in O.C.G.A. §12-5-7(a.1)(1) and (2) and the Drought Contingency Plans and Water Conservation Plans required under Rules 391-3-2-.4(11), 391-3-6-.07(4)(b)8, and 391-3-6-.07(4)(b)9, which are referenced within this rule, this rule does not repeat or modify any existing predrought mitigation strategy or create any new pre-drought mitigation strategies."** The last drought showed that completely eliminating outdoor watering has significant environmental and economic downfalls and cannot be repeated. Additionally restricting these types of efficient watering do not result in any significant additional water savings.

A. Timing restrictions would need to be practical from a horticultural and practical viewpoint. For example, drip irrigation needs to be able to be applied 24/7 as it only applies water in low gph rates through each emitter. In order to cycle through an application of several zones, water needs to run several hours on each zone.
B. Watering in of pesticides usually needs to be done as they are applied. Limiting hours does not allowing for environmentally sound or effective practice.
C. In summer planting, hour limits on new plantings will not work. On normal 90+ degree summer days, new material could be dead by the time watering is allowed.

5. Water rules must be consistent across jurisdictional lines. Business and individuals cannot be confused by varying rules that are difficult to communicate.

6. The drought triggers need not only to be communicated, but there must be a method of indicating to everyone where EPD is headed with drought levels. The term mentioned in the meeting of having the drought level declaration be discretionary for the Director gives no one, water systems included, any advance notice nor opportunity to plan.

7. I see no process for coming out of drought declarations. Determining that timing was more difficult than going into the drought. The process for restoring full water access needs to be planned as part of the process for coming out of a drought as making determination of drought levels going into the drought.

8. Baseline considerations using only the previous year's water use numbers are a poor decision based on the effect of weather and even more so the fact that as everyone increases or has increased their conservation level, that target is never still and becomes increasingly difficult in the future.

9. Definitions need to be cleared up. E.G., farm use, install, among others.

10. Drought surcharge principal is promising-make water cost what it should and people will use it wisely and conservatively at their own discretion. Implementation needs to be well thought out and discussed. However drought surcharge levels puts those uses, mostly outdoor, at double jeopardy—they already are proposed to be restricted and

then must be paid for at higher cost and later must also be part of % reduction target which is triple jeopardy. Again, involvement of experts who deal with this daily should be utilized.

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13. The only variance that the director will not approve is restrictions on outdoor water? Why? Page 8

14. Anyone who buys water from any system that gets water from USACE may not request a variance that is less stringent. Are not all systems interconnected in some fashion and many buy water from some source that uses Lanier and Allatoona (and other USACE water bodies)? Page 8

15. Non-municipal permittees >1MGD are fortunate to have economic consideration given their permit applications. Does none of the DMR apply to them between effective date and next permit application? Page 9 and 10

16. There may be a need to insert another drought level between 2 and 3 so that we don't go to such a drastic total outdoor ban from something so less drastic.

17. How is Drought Response Committee to be formed? Advance formation with input of experts and stakeholders would be appropriate. Page 3

Thank you for this opportunity to comment.

Tim Thoms

Tim Thoms

Thoms Trees and Plants, Inc
770-461-6013
www.thomstrees.com

Comments for Consideration on the Drought Management Rules

August 19, 2014

Tim Thoms, Thoms Trees and Plants, Inc.

tim@thomstrees.com 770-461-6013

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Thank you for this opportunity to comment.

Tim Thoms

Urban Ag Council

Cash, Tim

From: Mary Kay Woodworth <mkw@georgiauac.com>
Sent: Tuesday, August 19, 2014 6:15 PM
To: Cash, Tim
Cc: Pennington, Russ; Turner, Jud
Subject: Comments to Drought Draft Rule
Attachments: UAC comments on DroughtRule2014.docx

Tim,

Good afternoon, hope all is well with you. Please find attached comments to the draft provided by EPD at the stakeholder meeting. Please let me know if you have any questions or need assistance.

Mary Kay Woodworth
Executive Director

770-359-7337 (cell)
1-800-687-6949 (office)

www.urbanagcouncil.com

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August 19, 2014

James A. Capp, Chief, Watershed Protection Branch, EPD
2 Martin Luther King Jr. Drive, Suite 1152 East
Atlanta, GA 30334

RE: Drought Management Rule – Stakeholder Meeting #2

Dear Mr. Capp:

The Georgia Urban Ag Council would like to take this opportunity to submit comments regarding the draft State Drought Management Rule contemplated by the Georgia EPD Watershed Protection Branch. We work collaboratively with the Georgia Agribusiness Council and many of these comments parallel those submitted by GAC.

We recognize and promote efforts to enhance environmental stewardship, and water conservation is certainly an essential component of stewardship. We would like to offer the following comments for your consideration as the rulemaking process takes shape.

First, the Water Stewardship Act (WSA) of 2010 contemplated numerous water conservation programs, initiatives and guidelines. Some of these were geared toward planning for increased conservation and water loss reductions every day while others are geared toward clearly stating water use allowances to help protect jobs and economic viability of various industry sectors. As we have discussed previous drought planning overreached on several fronts and during the most recent major drought (2006 – 2009), this overreach hit Georgia's agriculture and landscape industries extremely hard. These sectors suffered more than $2 billion in economic losses and 35,000 jobs were eliminated according to a study conducted by the University of Georgia.

We believe that the approach taken must be more encompassing and holistic than narrowly focused on outdoor water use reductions and the WSA responded accordingly by including a series of outdoor water use exemptions. It states the following outdoor water uses **shall not have any limitation**:

1. Commercial agricultural operations as defined in Code Section 1-3-3;
2. Capture and reuse of cooling system condensate or storm water in compliance with applicable local ordinances and state guidelines;
3. Reuse of gray water in compliance with Code Section 31-3-5.2 and applicable local board of health regulations adopted pursuant thereto;
4. Use of reclaimed waste water by a designated user from a system permitted by the Environmental Protection Division of the department to provide reclaimed waste water;

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5. Irrigation of personal food gardens;
6. Irrigation of new and replanted plant, seed, or turf in landscapes, golf courses, or sports turf fields during installation and for a period of 30 days immediately following the date of installation;
7. Drip irrigation or irrigation using soaker hoses;
8. Handwatering with a hose with automatic cutoff or handheld container;
9. Use of water withdrawn from private water wells or surface water by an owner or operator of property if such well or surface water is on said property;
10. Irrigation of horticultural crops held for sale, resale, or installation;
11. Irrigation of athletic fields, golf courses, or public turf grass recreational areas;
12. Installation, maintenance, or calibration of irrigation systems; or
13. Hydroseeding.

Such language is important because it helps clearly highlight industries excluded from outdoor water use restrictions, such as farm use, as well as encouraging the use of water recapture, reuse and high efficient systems. However, it goes further by stating that new installations, hydroseeding, and handwatering are also exempt because of the need to protect plant life, landscape installations and the environment.

Second, in reference to various drought levels, we suggest the following regarding outdoor water use:

Drought Response Level 1

1) General Outdoor Watering. **Highlight the current outdoor irrigation allowance between the hours of 4:00 P.M. and 10:00 A.M.** for purposes of planting, growing, managing, or maintaining ground cover, trees, shrubs, or other plants, as described in O.C.G.A. §12-5-7(a.1). The current non-drought level does include hourly restrictions that reduce water use.
2) State the 13 exemptions listed in the law.

Drought Response Level 2

1) General Outdoor Watering. Outdoor irrigation for purposes of planting, growing, managing, or maintaining ground cover, trees, shrubs, or other plants, as described in O.C.G.A. §12-5-7(a.1) may be conducted between the hours of **8:00 p.m. and 8:00 a.m.**
2) State the 13 exemptions listed in the law.

Drought Response Level 3

1) General Outdoor Watering. Outdoor irrigation for purposes of planting, growing, managing, or maintaining ground cover, trees, shrubs, or other plants, as described in O.C.G.A. §12-5-7(a.1) **is not permitted with the exception of the 13 exemptions listed in the law.**
2) State the 13 exemptions listed in the law.

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Drought Response Level 3+

1) General Outdoor Watering. Outdoor irrigation for purposes of planting, growing, managing, or maintaining ground cover, trees, shrubs, or other plants, as described in O.C.G.A. §12-5-7(a.1) is not permitted and such unauthorized uses **shall be subject to a $250 fine per occurrence.**
2) State the 13 exemptions listed in the law.

Third, an additional allowance should be made for the watering in of pesticides and fertilizers. According to turfgrass specialists at the University of Georgia, many insecticides and fungicides need to be watered in immediately after application in order to move the product into the soil for effectiveness. We request language reflect these needs by allowing the watering in of these products **immediately following application or between the hours of 4:00 p.m. and 10:00 a.m. without exception to drought level.**

Fourth, we believe the implementation of water use reduction targets and a drought level pricing structure will aid in consumer responsiveness without unfairly targeting one type of water use over another.

Finally, we again stress EPD must establish measurable criteria for purveyors requesting to be more restrictive as well as a list of set objectives for such steps. These should include an analysis of reservoirs, stream flows and groundwater, as well as information on system water loss, balanced approach to prescribed water use reductions and stated goal of compliance (i.e. reduce water use by 10%, 20% etc.). The document "Guidance for Drought Response Modification Petition Process" dated May 27, 2008, is a good reference tool, however it targets only outdoor water use reductions as methods to meet water conservation objectives. Such a tiered conservation structure could be beneficial.

We understand that EDP will seek ruling on the authority of this Rule to supersede the exemptions in the law (WSA), and in addition to the above, we also offer the following comments specific to the rule strawman:

Rule 391-3-30-.08(2)(c)(i) for Level 1 seems a violation of 12-5 code and SB 370 intent and will have economic and practical detriment not only to all lawn care companies but environmental concerns as it clearly impacts best management practices. Please see above for suggested language and usage.

Rule 391-3-30-.08 (3)(b) for Level 2 – violation of 12-5 code and SB 370 intent - imposing hour restrictions on exempted uses.

- Specific to new installation, this will impact turf installation, along with other new installation and market demand by causing facilities to postpone projects as first 30 days watering is critical for root establishment.
- Specific to athletic fields and public turf grass recreational areas – it may be impractical to limit to those hours due to hours of use of and by those facilities and users.

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- Specific to efficient irrigation technologies (drip/soaker hose/other new technology) – due to highly efficient technologies, large commercial/recreational facilities and others may not be able to complete irrigation cycle during limited hours, thus potentially reducing the adoption of these technologies.

Rule 391-3-30-. 09(6) Limits less stringent options for water supply permittees whose water is from a Corp controlled water source. What is reason for this rule, it seems to discourage and remove conservation efficiency in those regions since they don't have any incentive for benefit when they are successful.

Thank you for your consideration of our comments and please feel free to contact me if we can be of assistance.

Sincerely,

Mary Kay Woodworth

Mary Kay Woodworth
Executive Director, Georgia Urban Ag Council

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