

WATER SHORTAGE RESPONSE PLAN

June 14, 2018

Orange Water and Sewer Authority
Carrboro, North Carolina



*A public, non-profit agency providing water, sewer and reclaimed water services
to the Carrboro-Chapel Hill community.*

ORANGE WATER AND SEWER AUTHORITY

WATER SHORTAGE RESPONSE PLAN

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SECTION 1.

PURPOSE AND BACKGROUND

This Water Shortage Response Plan (WSRP) describes the actions Orange Water and Sewer Authority (OWASA) will take during a water shortage condition due to drought or special operational constraints, including the measures that OWASA will implement to reduce potable water use during such shortage conditions. This plan has been prepared as required by North Carolina General Statute (NCGS) 143-355(l).

That statute requires most public water systems in the State to have a State-approved WSRP as a component of their Local Water Supply Plan. State regulations governing water use during droughts and water emergencies (15A NCAC 02E .0607) and Session Law 2008-143 passed in July 2008 set forth specific items that must be included in local WSRPs.

OWASA's WSRP is generally organized along the lines of the North Carolina Division of Water Resources' (DWR) *Water Shortage Response Plan (WSRP) Guidelines* issued in January 2009. This plan meets the following criteria as required by the State, including:

- ✓ tiered levels of water conservation measures or other response actions based on the severity of a water shortage condition;
- ✓ each tier is based on increased severity of drought or water shortage condition and represents increasingly stringent conservation measures;
- ✓ specific measurements of available water supply, water demand and system conditions that OWASA *must use* to determine the severity of water shortage conditions and to initiate water use reduction measures and the movement between various water shortage stages;
- ✓ procedures that will be followed to ensure compliance with the provisions of the plan;
- ✓ procedures for affected parties to review and comment on the plan prior to final adoption;
- ✓ procedures to receive and review applications for variances from specific requirements, and the criteria that will be used to evaluate such requests;
- ✓ general method for evaluating the effectiveness of the plan; and
- ✓ procedures for reviewing and revising the plan, which must be done at a minimum of every five years concurrent with the update of the state-required Local Water Supply Plan.

DWR is responsible for reviewing all Water Shortage Response Plans to ensure they meet the State's minimum requirements.

This plan is only one part of OWASA's long-term water conservation and demand management efforts. The OWASA Board of Directors approved a Long-Range Water Conservation and Demand Management Goal and Objectives in April, 2005. OWASA's primary strategies for

achieving its long-term conservation goals and objectives, and which are complementary to this WSRP but not described in this document, are:

- ✓ implementing aggressive conservation pricing structures, including increasing block water rates for residential customers, year-round water rates for all irrigation use, and seasonal water rates applicable to all other customers;
- ✓ promoting the use of reclaimed water for non-drinking purposes;
- ✓ treating and recycling drinking water treatment plant process water back to the head of the water plant; and
- ✓ providing education and awareness, including targeted water use audits for customers, technical assistance to developers, etc.

Additionally, water demands by OWASA's existing and future customers will be shaped by factors outside the control of OWASA, including but not limited to:

- ✓ Session Law 2007-546 (Senate Bill 668), *"An Act to Promote the Conservation of Energy and Water Use in State, University, and Community College Buildings;"*
- ✓ changes in water use efficiency standards of the NC Plumbing Code, as suggested in the North Carolina Department of Environment and Natural Resources' report titled *"Recommendations for Water Efficiency Standards for Water-Using Fixtures in Residential and Commercial Buildings"* (January 2009); and
- ✓ changes in climate, precipitation, and/or land use, which would affect rates and patterns of inflows into OWASA's water supply reservoirs, as well as customer demands.

Additional information about OWASA's comprehensive water conservation efforts is available on OWASA's website at www.owasa.org; by e-mail to info@owasa.org; by phone at 919-968-4421; by fax to 919-968-4464; or by mail to OWASA, 400 Jones Ferry Road, Carrboro, NC 27510.

SECTION 2.
AUTHORIZATION

OWASA's Executive Director is responsible for: (a) declaring a Water Shortage as described in this Plan; (2) enacting the applicable provisions of this WSRP; and (3) overseeing implementation of the Plan. In the Executive Director's absence, OWASA's General Manager of Operations is responsible for such actions.

As required by NCGS 143-355, OWASA will implement the provisions of this Plan whenever the trigger conditions established herein (and/or as they may be revised from time to time in accordance with Section 10 of this plan) occur.

Following is the contact information for the above-listed individuals as of the date of this plan:

PRIMARY RESPONSIBILITY

Ed Kerwin, or Successor
Executive Director
Orange Water and Sewer Authority
400 Jones Ferry Road
Carrboro, NC 27510

Telephone: 919-537-4211
E-Mail: ekerwin@owasa.org

ALTERNATE

Todd Taylor, or Successor
General Manager of Operations
Orange Water and Sewer Authority
400 Jones Ferry Road
Carrboro, NC 27510

Telephone: 919-537-4216
E-Mail: ttaylor@owasa.org

SECTION 3.

NOTIFICATION OF EMPLOYEES AND CUSTOMERS

OWASA will, as soon as possible, notify its employees, customers, and the public if and when a Water Shortage declaration is issued as described in Sections 4 and 5. Such notification will be provided via several methods, including but not limited to the following:

1. OWASA's Executive Director (or designee) will notify the following officials and agencies:
 - ✓ OWASA Board of Directors;
 - ✓ OWASA General Counsel;
 - ✓ Managers of the Towns of Carrboro and Chapel Hill, and Orange County; and
 - ✓ Division of Water Resources and the Public Water Supply Section within the NC Department of Environment and Natural Resources.
2. The Executive Director (or designee) will inform all OWASA employees of changes in Water Shortage stages and conservation requirements applicable to OWASA customers. This will be communicated via one or more methods, including but not limited to:
 - ✓ e-mail through the OWASA Local Area Network;
 - ✓ presentations at staff and crew meetings; and
 - ✓ memoranda or other written materials.

Employees will be reminded of their role and responsibility and applicable procedures for monitoring and responding to potential or actual violations of applicable water use restrictions. If an employee observes such an event, he/she will be instructed to attempt to inform the customer of the restrictions in effect, the observed violation, the need for corrective action by the customer, and consequences of repeat violations.

3. OWASA's Communications and Community Relations Officer (or designee) will contact the news media (including newspapers, television, and radio) and provide them with information about the applicable declaration, associated requirements, water rate surcharges if applicable, etc. Such notifications may be made by e-mail, website postings, news releases, telephone, etc. News releases will include the name(s) and contact information of the OWASA staff member(s) that will be primarily responsible for addressing media inquiries.

As in the past, OWASA will make extensive use of e-mail, the media, the OWASA website, etc. to provide information to its customers about the need to conserve water, the use restrictions in effect, and water rate surcharges if applicable.

4. The Communications and Community Relations Officer (or designee) will be responsible for updating the OWASA website in a timely manner regarding current information on the status of local water supply and demands, Water Shortage declarations, conservation requirements, and water rate surcharges if applicable.

5. The Communications and Community Relations Officer (or designee) will assist OWASA staff in responding to customer inquiries.
6. The Communications and Community Relations Officer (or designee) will contact local law enforcement personnel about the applicable water conservation requirements in effect during the declared Water Shortage.
7. If feasible, OWASA will notify residential and non-residential customers of water restrictions via media and e-mail. In addition, OWASA staff may provide targeted information to the following customers:
 - ✓ The University of North Carolina at Chapel Hill;
 - ✓ UNC Hospitals;
 - ✓ Chapel Hill-Carrboro City Schools;
 - ✓ multi-family residential property owners/managers/residents;
 - ✓ irrigation customers;
 - ✓ hotels, motels, and restaurants; and
 - ✓ others as appropriate.
8. OWASA may place informational signs at high-visibility locations, such as the OWASA Administration Building, local town halls, entranceways to Carrboro and Chapel Hill, etc.

SECTION 4.

WATER SHORTAGE RESPONSE PROGRAM

The cornerstones of OWASA's water shortage response strategy are:

1. Water Conservation Standards, including year-round water use restrictions;
2. OWASA's water rate surcharges that are implemented during a declared water shortage and increase as the severity of the shortage increases; and
3. Public education and awareness, including provisions for voluntary issuance of a water shortage advisory by OWASA during unusually dry periods.

Water Conservation Standards

OWASA has established Water Conservation Standards that apply to the use of OWASA drinking water by all customers. The current Standards, which went into effect in June 2009, include year-round water use restrictions and four tiers of increasingly strict requirements depending on the severity of water shortage conditions.

The Water Conservation Standards are summarized in Table 4-1. The full text of the current Standards is included as Appendix A.

To complement and support OWASA's water shortage response program, the Town of Carrboro, Town of Chapel Hill, and Orange County enacted local water conservation ordinances which incorporate all of OWASA's Water Conservation Standards. The applicable provisions of the local ordinances go into effect upon a request by OWASA and subsequent proclamation by the chief elected official of each jurisdiction.

(The implementation and associated enforcement actions under the local water conservation ordinances is outside the direct control of OWASA. OWASA works very closely with the local governments to coordinate monitoring and enforcement efforts to promote compliance with applicable use restrictions.)

Table 4-1.

SUMMARY OF KEY CONSERVATION STANDARDS FOR OWASA DRINKING WATER *

Effective June, 2009

Water Use	Year-Round	Stage 1	Stage 2	Stage 3	Emergency
Spray Irrigation of Turf / Grass (on designated days of the week as noted)	3 days per week, up to 1 inch per week, 6 pm - 10 am only ** Odd Addresses: Tu/Th/Sat Even Addresses: Sun/W/F	1 day per week, up to 1/2 inch per week, 6 pm - 10 am only ** Odd Addresses: Tues. Even Addresses: Thurs.	X**	X**	X
Spray Irrigation of Non-Turf Plant Materials (on designated days of the week as noted)	3 days per week, up to 1 inch per week, 6 pm - 10 am only ** Odd Addresses: Tu/Th/Sat Even Addresses: Sun/W/F	3 days per week, up to 1 inch per week, 6 pm - 10 am only ** Odd Addresses: Tu/Th/Sat Even Addresses: Sun/W/F	1 day per week, up to 1/2 inch per week, 6 pm - 10 am only ** Odd Addresses: Tues. Even Addresses: Thurs.	X***	X
Drip irrigation, underground drip emitters, soaker hose, hand-watering, and other non-spray methods allowed <i>at any time</i> or frequency	✓	✓	✓	✓	X
Washing of Building Exteriors Before Painting	✓	✓	✓	X	X
General Cleaning of Building Exteriors, Paved Areas, Etc.	✓	✓	X	X	X
Filling, Refilling, or Topping Off Ornamental Ponds, Fountains, etc.	✓	✓	X	X	X
Vehicle Washing	✓	✓	Only at commercial or institutional facilities where at least 50% of the water is being recycled, or is from a non-potable source or well	X	X
Filling, Refilling, or Topping Off of Swimming Pools and Backyard-Scale Facilities to Support Wildlife	✓	✓	✓	✓	X
Flushing or Pressure Testing New Water Lines	✓	✓	✓	✓	Only if captured and returned to system
Year-Round Requirements, Regardless of Water Shortage Condition > Automatic controllers and rainfall or soil moisture sensors required on all irrigation systems > "Wasteful" water use* prohibited at all times > Water leaks must be repaired within 10 days of discovery and/or notification by OWASA > Water may be served in restaurants and other dining facilities only at customer's request > Hotel/motel linens may only be changed upon customer changeover, every 5 days, or upon customer request					
Symbols and Notes					
* For the actual text of OWASA's Water Conservations Standards, please use the following link: http://www.owasa.org/conservationstandardsmarch26_2009					
✓ Water use is allowed.					
X Water use is not allowed.					
** Restrictions may not apply to public purpose athletic fields, recreational fields, or public purpose botanical sites operated in compliance with OWASA-approved Water Conservation Plans.					
*** Restrictions may not apply to public purpose botanical sites operated in compliance with OWASA-approved Water Conservation Plans.					

Water Rate Surcharges During Declared Water Shortages

In 2007, OWASA adopted water rate surcharges to be imposed during declared water shortages. The surcharges were implemented during the 2007-2008 drought and resulted in a substantial reduction in water use.

Based on that experience, OWASA refined the surcharges in 2008 to apply more equitably to all customer classes throughout all drought stages.

Table 4-2 summarizes the water rate surcharges included in OWASA's October 1, 2017 schedule of rates and fees. When the surcharges are implemented, the applicable water rates in effect are increased by the factors shown in the table. The OWASA Board of Directors, at its discretion, may from time to time revise the water rate surcharges following a public hearing on OWASA's rates, fees and charges.

Table 4-2.

WATER RATE SURCHARGES IN DECLARED WATER SHORTAGES

Individually-Metered Residential						Multi-family Master-metered Residential	Non-Residential and Irrigation- Only
Block:	Res. Block 1	Res. Block 2	Res. Block 3	Res. Block 4	Res. Block 5		
Use Level: (gallons)	1,000 to 2,000	3,000 to 5,000	6,000 to 10,000	11,000 to 15,000	16,000 and up		
Stage 1	No surcharge	No surcharge	1.25 times normal Block 3 rate	1.5 times normal Block 4 rate	2 times normal Block 5 rate	1.15 times year- round rate	1.15 times seasonal and irrigation-only rate
Stage 2	No surcharge	1.25 times normal Block 2 rate	1.5 times normal Block 3 rate	2 times normal Block 4 rate	3 times normal Block 5 rate	1.25 times year- round rate	1.25 times seasonal and irrigation-only rate
Stage 3 and Emergency	No surcharge	1.5 times normal Block 2 rate	2 times normal Block 3 rate	3 times normal Block 4 rate	4 times normal Block 5 rate	1.5 times year- round rate	1.5 times seasonal and irrigation- only rate

Calculating OWASA's Water Rates With Water Shortage Surcharges in Effect

Based on the water rates in effect as of October 1, 2017 (and which will be revised at the discretion of the OWASA Board of Directors), here are a couple illustrations of how OWASA's water rates change when water rate surcharges are in effect.

Example 1: *The Block 3 water rate for individually-metered residences is \$7.83 per 1,000 gallons of water use (use between 6,000 and 10,000 gallons). When the Stage 1 water rate surcharge is in effect, the Block 3 rate would increase to \$9.7875 per 1,000 gallons (an increase of 25%).*

Example 2: *The Peak Season (May – October) water rate for all non-residential and non-irrigation customers is \$7.91 per 1,000 gallons of water use. Under Stage 3 surcharges, the Peak Season water rate would increase to \$11.865 per 1,000 gallons (an increase of 50%).*

Major Water Conservation Initiatives of OWASA

Following the extreme droughts of 2001-2002 and 2007-2008, OWASA implemented a number of important strategies to reduce and manage customer demands throughout the year, including:

1. Implementing a permanent process water recycling system at the Jones Ferry Road Water Treatment Plant. This has reduced average daily raw water withdrawals by about 7% since the fall of 2002.
2. Establishing seasonal water rates for all customers beginning in 2002 and subsequently implemented a five-tiered increasing block rate structure for all individually-metered residential customers beginning in 2007.
3. Implementing a new reclaimed water system to initially serve the University of North Carolina at Chapel Hill. This system reduces drinking water demands by approximately 0.65 million gallons a day (mgd).
4. Continuing water conservation education and awareness efforts for OWASA customers, including information and technical assistance for customers interested in implementing cost-effective conservation measures.

As a result of these strategies and the conservation efforts by OWASA customers, average day water sales in the OWASA service area are about the same now as they were in 1991 despite about a 60% increase in OWASA's customer base during that period.

Together, these measures have reduced the community's risk to droughts and other water shortage conditions, thereby reducing the need for additional restrictions during such events. It is, however, essential that OWASA have a water shortage response program in place to respond to such events because the potential for a water shortage due to drought or other event always exists.

SECTION 5.

MANDATORY WATER SHORTAGE RESPONSE TRIGGERS

As required by NCGS 143-355, OWASA has established a set of specific measurements of available water supply and demand conditions to: assess the severity of water shortage conditions during extended droughts; guide the initiation of water use reduction measures; and guide the transition between the various water shortage stages described in this Plan. The measurements and rationale are explained below.

From time to time, it may be necessary to implement water use restrictions in response to certain drinking water system emergencies, such as water main breaks, water quality problems, planned and unplanned maintenance events, natural disasters, etc. OWASA's water shortage response strategy for operational emergencies is also described below.

OWASA staff continually monitors and evaluates the operational status of water supply, treatment, and distribution system components to ensure that customer demands can be met at any given time. Staff also tracks customer demands and the amount of raw water supply remaining in each supply source on a daily basis. USGS streamflow gaging data are monitored closely to determine conditions and trends in inflows to the reservoirs. This and other information is used to guide OWASA's water shortage response strategy.

Triggers for Implementing Water Shortage Response Stages During Extended Droughts

OWASA's drought management decisions are guided primarily by the estimated level of risk that usable reservoir storage will decline to 20 percent (approximately 700 million gallons [MG]) or less during the next 12 months. At a raw water demand level of 7.5 mgd, 700 MG of raw water supply on-hand would meet customer needs for approximately three months during an extreme drought, thus providing time to implement emergency water supply augmentation and conservation measures.

Water supply risk is determined from OWASA's Reservoir Optimization Model (OWASA-ROM), which includes a statistical analysis of 82 years of actual and simulated streamflow records (1926-2007) for the Cane Creek/University Lake/Quarry Reservoir supply system. The model simulates what reservoir storage levels would be under various levels of annual average-day demand, storage volume remaining at a given time of the year, and historical streamflows and evaporation rates.

The average-day demand for the year is adjusted to reflect historical monthly demand ratios for the OWASA system. The model reflects OWASA's operating protocols and the capacities of existing raw water pumping and transmission facilities. It simulates reservoir inflows, levels and demands on a daily time-step, and evaluates the reliability of the system to meet demands while maintaining a minimum emergency storage reserve target of 20% of total capacity as a margin of safety.

OWASA-ROM has been used to estimate the total reservoir storage volumes (percent remaining) that correspond to approximately 2% (2 years in 82), 10% (8 years in 82) and 20% (16 years in 82) probabilities that reservoir storage will be drawn down to 20% or less of storage during the

following 12 months under various annual average-day demand levels and assuming no other action taken to reduce demands and/or augment the supply.

In the late fall, winter and early spring, when inflows are typically higher and demand lower, reservoir storage can drop to relatively low levels before the risk of drawdown to 20% or less during the following 12 months becomes significant. From late spring through fall, when demand rises and inflows decline, the level of risk for a given demand increases.

This analysis has been used to establish the trigger levels that will automatically result in OWASA's implementation of the various Water Shortage stages and associated restrictions.

Figures 5-1 through 5-4 show the trigger levels that will apply to the implementation of successive Water Shortage response stages under annual average-day demands of 7.0, 8.0, 9.0, and 10.0 mgd, respectively. (OWASA projects average-day raw water withdrawals will be about 7 mgd in Fiscal Year 2018.)

OWASA's Executive Director will declare the appropriate Water Shortage stage within five (5) working days after the trigger has been reached (assuming storage remains at or below the applicable level). However, OWASA may declare a Water Shortage or implement stages before the specific trigger is reached (sooner than the applicable Figure would indicate) if other factors indicate such an action is appropriate or required upon approval by the Board of Directors.

Staff will provide regular informational reports to the Board during extended droughts. Other factors that will be considered when determining whether to declare a Water Shortage before a specific trigger is reached include but are not be limited to:

- regional water supply and demand conditions and forecasts;
- likelihood of obtaining raw or finished water from other utilities;
- Drought Advisory issued by the NC Drought Management Advisory Council; and
- long-term weather forecasts.

It is also possible that Water Shortage response stages may not necessarily be implemented sequentially if water supply and/or demand conditions change rapidly.

If and when OWASA determines a Water Shortage stage is in effect, it will clearly explain to its customers and the public the basis for the decision, including the estimated risk that the local water supply could be drawn down to very low levels (at or below 20% of total storage) over the following 12 months.

**OWASA Water Shortage Trigger Levels for
Average Annual Demand of 7.0 MGD**

Figure 5-1

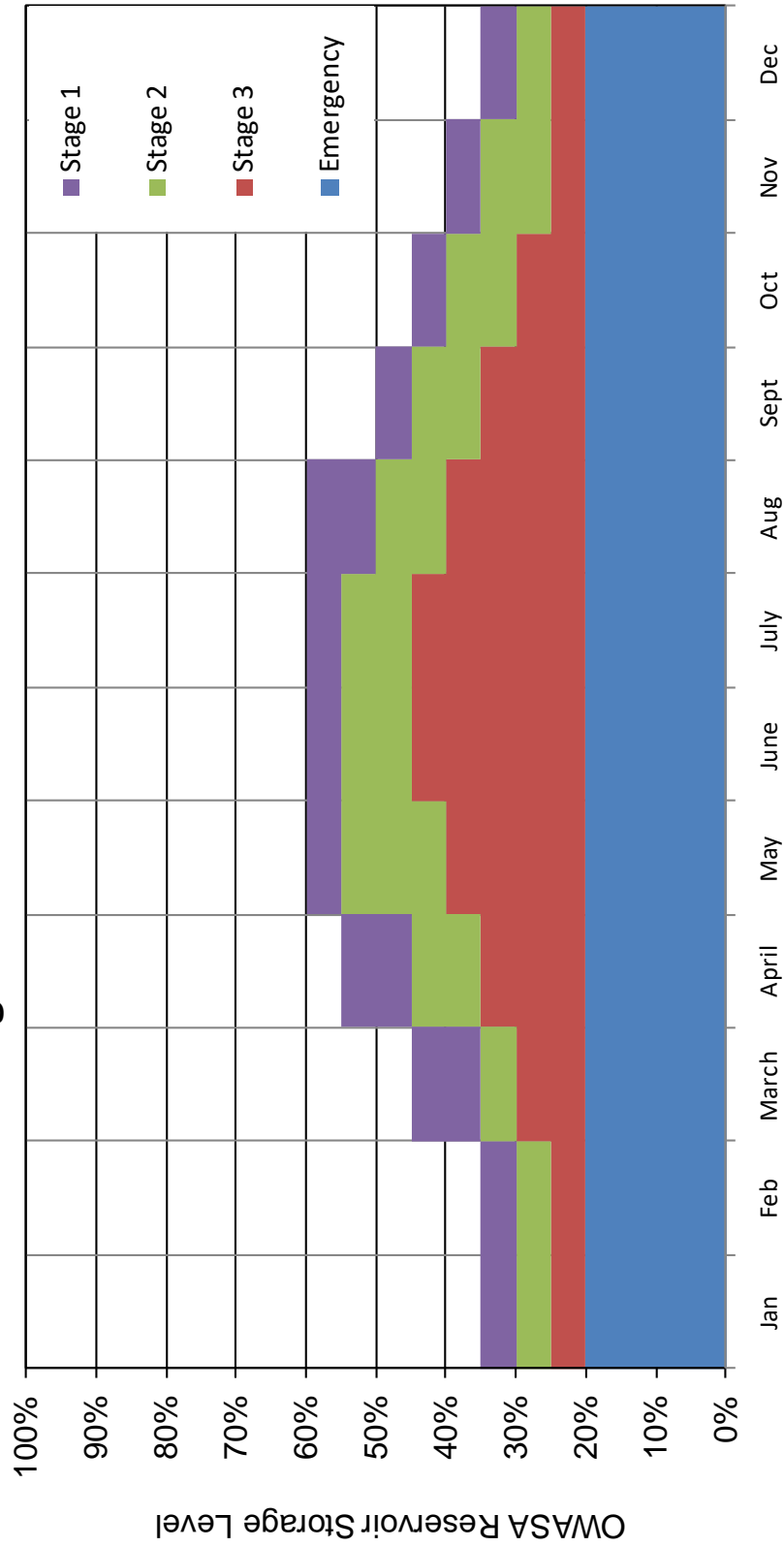


Figure 5-2

**OWASA Water Shortage Trigger Levels for
Average Annual Demand of 8.0 MGD**

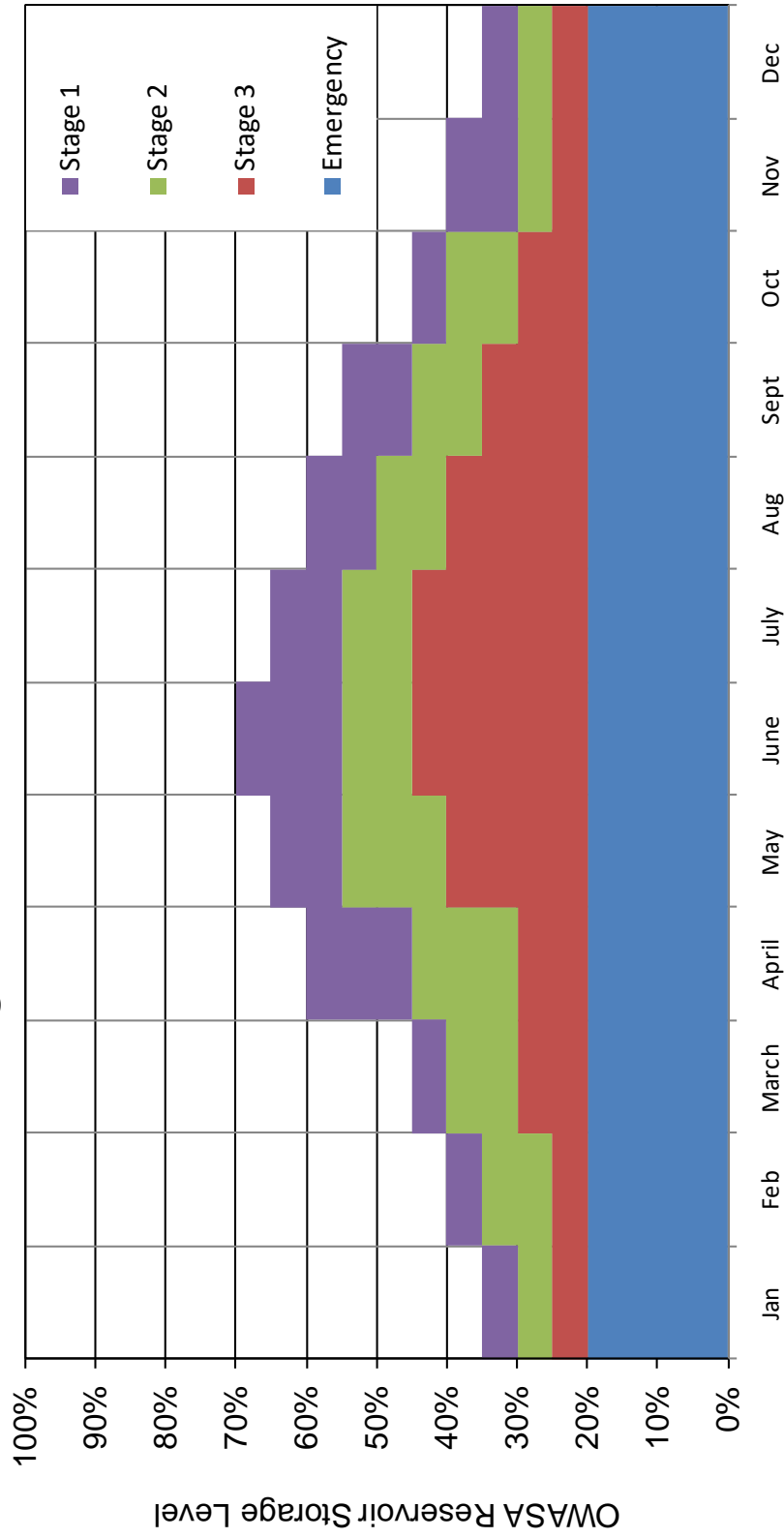


Figure 5-3

**OWASA Water Shortage Trigger Levels for
Average Annual Demand of 9.0 MGD**

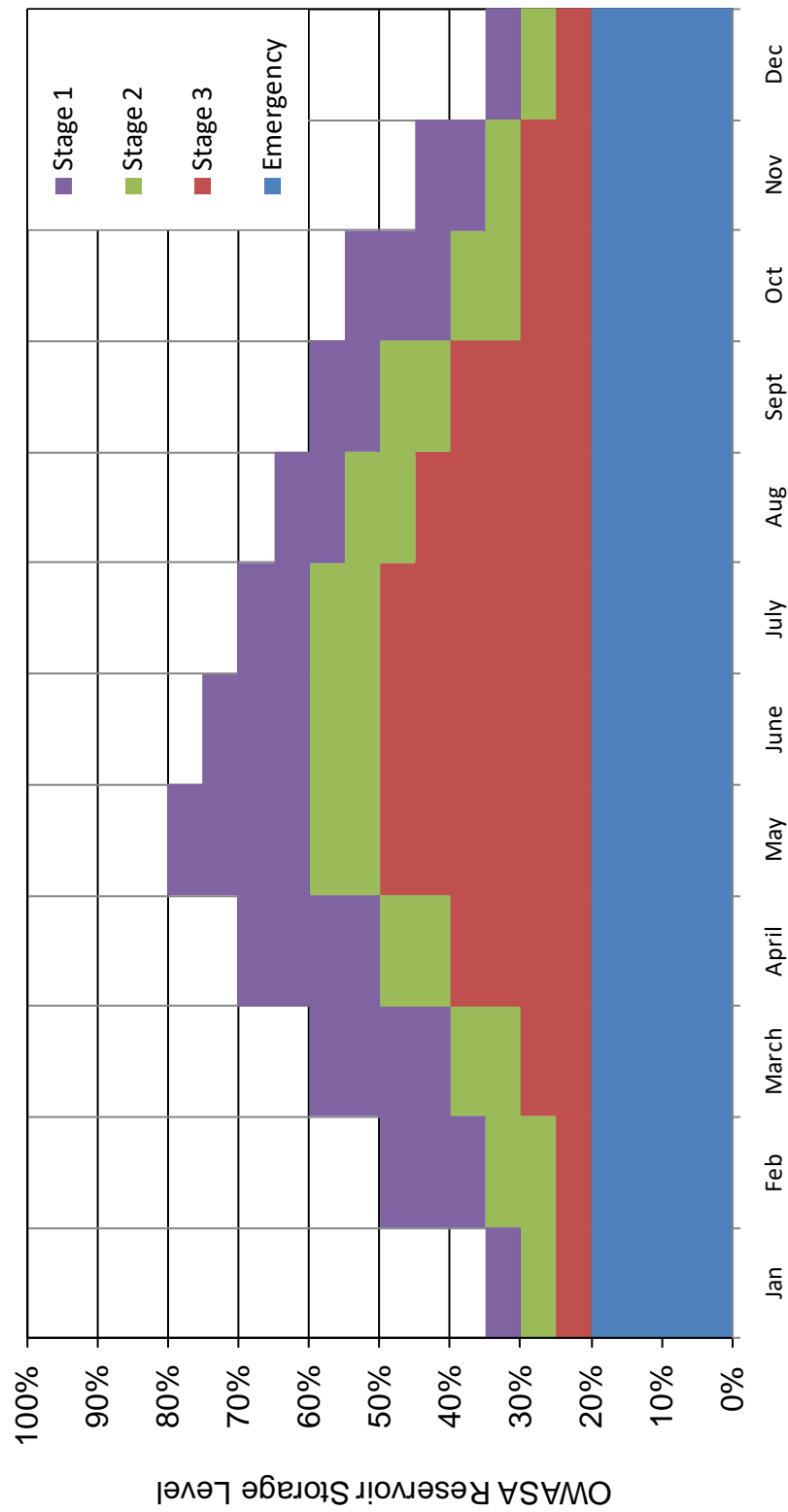
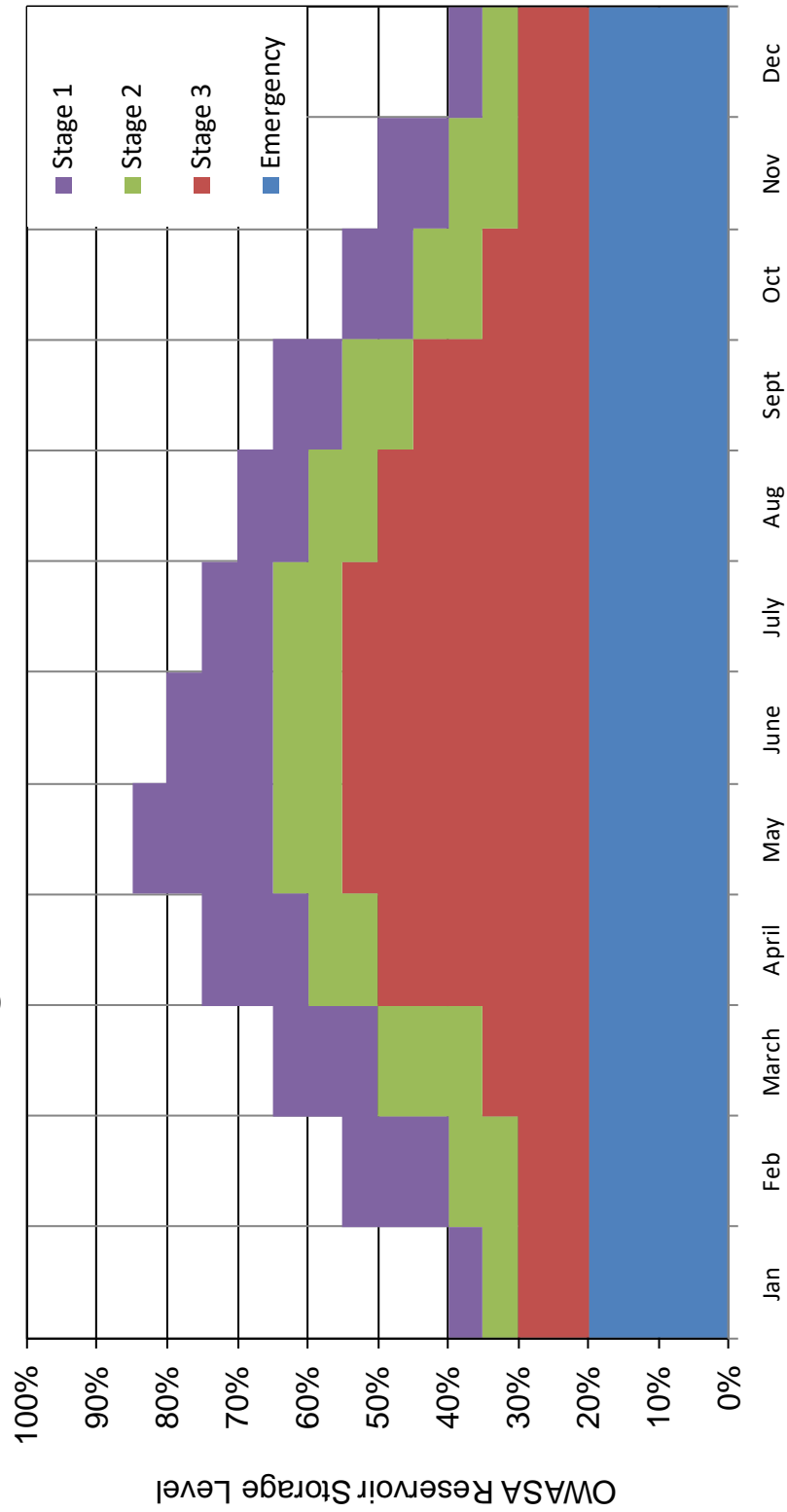


Figure 5-4

**OWASA Water Shortage Trigger Levels for
Average Annual Demand of 10.0 MGD**



Triggers for Rescinding Water Shortage Response Stages During Extended Droughts

For a Water Shortage stage to be rescinded, the water supply storage volume must be at least ten percent (10%) above the specified Water Shortage initiation trigger for the applicable stage. However, OWASA's Executive Director may delay the rescission of a Water Shortage stage depending on water supply and demand conditions, extended weather forecast, regional water supply conditions and outlook, and other factors.

As with initiation, rescission of Water Shortage stages may not always occur sequentially, depending on how quickly supply and/or demand conditions change.

Water Shortage Response Triggers for Operational Emergencies

OWASA may occasionally need to implement mandatory water use restriction to address abnormal operating conditions – other than extended droughts – when current demand cannot be met. Such events include, but are not limited to:

- production problems at the Jones Ferry Road Water Treatment Plant;
- pump, tank, or pipeline failures;
- raw or treated drinking water quality problems;
- planned or unplanned maintenance events; and
- natural disasters.

OWASA may declare a Water Supply Shortage or Emergency whenever customer demand – as averaged over three consecutive days – exceeds 85 percent of OWASA's capability of treating and delivering water. The stage and duration of such a Water Supply Shortage or Emergency shall be guided by the degree to which customer demands approach or exceed OWASA's capacity to meet those demands, and by the degree to which conservation efforts successfully reduce short-term demands.

Operational emergencies are typically characterized by the need for rapid response by OWASA and its customers, and may require major curtailment of water use in a short period of time.

Non-drought water emergencies are unique because of the potential lack of preparation time and the need for immediate and potentially large-scale demand reductions. Because each emergency scenario is different, no single strategy can meet OWASA's needs during all emergency scenarios.

If OWASA's Executive Director determines that an emergency operating condition exists, he/she may implement a Water Shortage response stage and associated mandatory water use restrictions that he/she deems necessary and appropriate given the nature, extent, and expected duration of the emergency condition.

The Water Shortage response stage initially selected may be quickly modified as operating conditions are further assessed and there is a better understanding of the length of time that may be needed to restore normal operating and/or demand conditions.

SECTION 6.

ENFORCEMENT

OWASA does not have statutory authority to establish water conservation ordinances; therefore, as described in Section 4, it has established Water Conservation Standards applicable to all OWASA customers. The Standards include year-round mandatory water use restrictions as well as a system of increasingly stringent restrictions for different stages of a declared water shortage.

OWASA does not have statutory authority to directly impose civil or criminal penalty provisions for violations of its Conservation Standards. The Standards provide for the temporary disconnection of water service to any customer that repeatedly violates the Standards.

Upon learning of an actual, reported, or suspected violation, OWASA staff will contact the customer by phone, in person, and/or in writing to inform them of:

- ✓ the restrictions in effect;
- ✓ the nature of the actual, reported, or suspected violation;
- ✓ the need for corrective action by the customer; and
- ✓ the potential consequences of continued violations, including temporary disconnection of service for non-compliance with the Standards and the potential for citation by local government law enforcement officers.

In addition to OWASA's authority and approach to enforcing its Standards, the Carrboro, Chapel Hill and Orange County ordinances include civil penalty provisions for violations of their respective conservation ordinances, which, as noted before, are based on the OWASA Standards.

SECTION 7.

PROCEDURES FOR REVIEW OF VARIANCE REQUESTS

OWASA's Water Conservation Standards allow exemptions only for the following water uses during declared Water Shortages:

- ✓ Public purpose athletic fields and public purpose botanical sites are exempt from certain irrigation restrictions provided that an OWASA-approved site-specific Water Conservation Plan is in place.
- ✓ Car washes are exempt from certain restrictions provided that at least 50% of their water has been recycled, is from a non-potable water source, or is supplied from a well.

(Exemptions from water use restrictions do not include exemptions for water rate surcharges.)

Customers may request a variance from the Water Conservation Standards by submitting a letter or e-mail to OWASA's Executive Director (or designee) specifically describing the nature and reason for the requested variance and the customer's specific plan to reduce water use or to maintain a high level of water use efficiency during the declared shortage.

A decision to approve or deny individual variance requests will be provided to the customer within two weeks of receipt of the request, after careful consideration of the following criteria:

- ✓ purpose and necessity for use of drinking water;
- ✓ social and economic importance/hardship imposed by compliance with the Standards;
- ✓ the prevention of structural damage impact;
- ✓ expected duration of the use for which the variance is requested;
- ✓ expected direct and indirect impact on water demands; and
- ✓ practicality of options for alternative water sources.

Required Water Conservation Plans may be submitted at any time and will be reviewed and either approved or denied by OWASA within six weeks of receipt. To be considered for approval, a Water Conservation Plan must include:

1. Estimated amount of water use per day during both an average winter month and an average summer month for various purposes, including drinking water, basic sanitation, process water, irrigation, and other major uses specific to the customer
2. Description of alternate water sources available
3. Description of existing measures or high-efficiency fixtures in place to reduce water use
4. Measures that could be taken during each Water Shortage Response Stage for which a variance is requested in order to meet the percentage reductions in Table 8-1.

5. Description of the impact to the customer (e.g. reduced production, reduction of business hours, employment impacts, structural damage, etc.) of meeting the Table 8-1 water use reduction percentages during each Water Shortage Response Stage for which a variance is requested.
6. Proposed alternative measures to be taken during each Water Shortage Response Stage for which a variance is requested, and the resulting expected percentage reduction in water use for the categories listed in item 1, under both average winter and average summer conditions.

SECTION 8.

EXPECTED AND ACTUAL EFFECTIVENESS OF THIS PLAN

Because OWASA revised its Water Conservation Standards in June 2009 and no drought has occurred subsequent to that date, there is no actual data or experience regarding the effectiveness of these Standards. However, based on customer response to water use restrictions and other measures in place during the 2001-2002 and 2007-2008 droughts, OWASA has the following water use reduction objectives associated with the Water Shortage Response Stages in the Standards:

Table 8-1.

Expected/Targeted Water Use Reductions for OWASA's Water Shortage Stages

Water Shortage Response Stage	Target Reductions Relative to Normal* Water Use
Stage 1	10%
Stage 2	15%
Stage 3	20%
Emergency	To be Determined

* Normal Water Use is the level of customer demands that would be expected to occur during the time of the year that the Water Shortage Response Stage is in effect.

OWASA will periodically evaluate the effectiveness of its Water Shortage response actions through several methods, including but not limited to:

- ✓ comparing actual demand reductions achieved to the objectives of the Water Conservation Standards, as well as demand information for the same period for prior years;
- ✓ monitoring the frequency, severity, and duration of declared Water Shortage conditions;
- ✓ identifying any situations where action should have been taken but was not required under this plan;
- ✓ monitoring the number, type and recurrence of violations of applicable water use restrictions, and any required enforcement actions; and
- ✓ reviewing the inquiries and feedback received from customers during declared Water Shortages.

SECTION 9.

PUBLIC REVIEW AND COMMENT

In accordance with State law, OWASA's draft 2010 WSRP was issued for public review and comment and all comments received were considered prior to the OWASA Board of Directors' formal approval of the WSRP.

The core components of this Plan – OWASA's Water Conservation Standards, Water Shortage response stages, and associated water use restrictions – were adopted by OWASA in June 2009 following an extensive public review and comment process that included stakeholder meetings, review and comments from local governments and the Chapel Hill–Carrboro Chamber of Commerce, and a formal public hearing. Notice of the proposed Standards and restrictions was provided in the local newspaper and on OWASA's website.

The draft 2010 WSRP was made available for public review and comment for two weeks in advance of final consideration by the OWASA Board of Directors. Public review and comment was invited by:

- ✓ posting the draft on OWASA's website (www.owasa.org);
- ✓ providing copies for public review at OWASA's main office and the Chapel Hill Public Library;
- ✓ providing notice in the local newspaper of the draft plan's availability and the deadline for submitting written and/or verbal comments; and
- ✓ issuing electronic news releases announcing the availability of, and inviting comments on, the draft plan.

OWASA invited interested persons to submit written comments via e-mail or letter, and/or verbal comments at the public meeting when the draft was considered by the OWASA Board of Directors. Following consideration of the public comments, the OWASA Board of Directors formally approved OWASA's WSRP on November 11, 2010 (Appendix D).

The 2015 update of the WSRP included minor updates such as contact information changes. It also included a summary of OWASA's Drought Response Operating Protocol which was approved by the Board of Directors on January 10, 2013, which was developed to align with the 2010 WSRP. The DROP made no modifications to the trigger graphs included in Section 5 of this Plan. This version of the WSRP was presented to the Board at a work session on December 11, 2014 and approved by the Board of Directors along with OWASA's Local Water Supply Plan at its January 22, 2015 meeting (Appendix D).

This update of the WSRP includes minor updates (Table 4-2 is updated to reflect the change in multi-family, master-metered residential rates, the reclassification of our Public Affairs Administrator to Communications and Community Relations Officer, and other minor formatting changes. This version of the WSRP was presented to the Board of Directors at a work session on June 14, 2018 along with OWASA's 2017 Local Water Supply Plan (Appendix D).

SECTION 10.

FUTURE REVIEW AND REVISION OF OWASA'S WSRP

In accordance with State requirements, OWASA will review the local WSRP, and revise it where necessary, as follows:

- ✓ concurrent with the update of OWASA's Local Water Supply Plan as required per NCGS 143-355(1), which occurs a minimum of once every five years;
- ✓ following the rescission of all mandatory water use restrictions that were imposed during an event that required declaration of a Stage 1, Stage 2, Stage 3, or Emergency Water Shortage condition; and/or
- ✓ at any time as deemed necessary to reflect changes in water supply and demand conditions, new information regarding the effectiveness of conservation management practices including the water use restrictions in OWASA's Water Conservation Standards, experience gained with implementation of the plan, and other factors.

Prior to the OWASA Board's final consideration of any proposed major revisions to the local WSRP, OWASA will provide its customers and the public an opportunity to review and comment on the proposed revisions. Information about proposed revisions and requests for comments on such proposals will be provided via OWASA's website, e-mail communications, news releases, notices of availability published in the local newspaper, etc. The draft plan will be available at OWASA's main office building and on our website (www.owasa.org) for public review.

The Executive Director (or designee) will be responsible for initiating all major WSRP updates, and for ensuring that OWASA customers and the public have the opportunity to comment on the plan and any proposed changes prior to final approval by the OWASA Board of Directors.

It has been OWASA's practice to meet with representatives of organizations such as the Chamber of Commerce, green industry, and local governments to receive information, comments, and suggestions regarding the effectiveness of existing water use restrictions and potential changes to those restrictions. OWASA will continue this practice as part of future evaluations and major updates of this plan.

APPENDIX A

OWASA WATER CONSERVATION STANDARDS

Orange Water and Sewer Authority
Water Conservation Standards
(Approved March 26, 2009)

Article I – Purpose and Definitions

I. A. Purpose

These Water Conservation Standards are enacted by the Orange Water and Sewer Authority (OWASA) for the purposes of:

1. Reducing the rate of increase in overall water use through year-round water conservation practices that will help maximize the community's existing and planned water supply sources and help reduce seasonal peak day demands that result in the need for costly expansion of water treatment, storage, and transmission facilities. Such year-round practices shall include:
 - a. Reducing indoor water waste by encouraging the installation and maintenance of ultra-low flow toilets, faucet aerators, low-flow showerheads and similar devices, as well as other creative and commonsense indoor conservation practices.
 - b. Reducing irrigation and irrigation-related water waste without sacrificing landscape quality through the cultivation of lower water use plants; improved landscape design and planting practices; more efficient watering practices; and improved irrigation system design and maintenance.
 - c. Increasing the use of non-potable water, as permitted by appropriate public health regulations, for irrigation and other uses that do not require water of potable quality.
2. Providing an orderly process for reducing community-wide water demands during periods of drought or other naturally occurring causes of water shortages.
3. Providing an orderly process for reducing community-wide water demands during periods of water shortages due to natural disaster (other than drought), major OWASA facilities failure, or other unexpected and sudden loss of water supply, treatment, or distribution capacity that constitutes a water supply emergency.

I. B. Definitions

For the purpose of these Standards, the following definitions shall apply unless the context clearly indicates or requires a different meaning.

AUTOMATIC CONTROLLER. A mechanical or electronic device capable of operating an irrigation system and its component valve stations according to a pre-determined schedule of irrigation frequency and duration.

CISTERN. A tank or container, typically located underground, for the storage and subsequent reuse of rainwater collected from rooftops or other impervious surfaces that would have otherwise evaporated or drained off the premises.

DRIP IRRIGATION. The application of irrigation water through drip emitter devices at low pressure, volume, and velocity near or at ground level in order to minimize runoff and evaporative losses. Drip irrigation emitters are typically used for irrigating non-turf vegetation and release water in the range of 0.04 to 0.40 gallons per minute.

EVEN-NUMBERED PROPERTIES. Properties with street addresses that end in even-numbered digits, or other properties so designated for the purposes of these Standards through special arrangements with OWASA.

GRAYWATER. Wastewater removed from household wash basins, bathtubs, or showers. Graywater may only be reused in accordance with practices approved by applicable regulatory agencies.

HAND WATERING. The application of water for irrigation purposes through a hand-held hose or watering container.

HARVESTED WATER. Precipitation or irrigation runoff collected, stored and available for reuse for irrigation purposes.

IRRIGATION SYSTEM. Any permanently installed system of pipes, hoses, or other conveyance devices and appurtenances that provides water to living plant material through spray heads or other emission devices located at, above, or below the ground surface. For the purposes of these Standards, a sprinkler, soaker hose, or other device connected to its water source via a moveable above-ground garden hose is not considered to be an irrigation system.

LANDSCAPE AREA. That portion of a parcel that contains turf or non-turf vegetation.

LOW-PRECIPIATION BUBBLER. An irrigation head which typically operates within six inches of ground level and delivers water at a rate of less than 0.45 gallons per minute within a radius of less than two feet of the head. Low-precipitation bubblers are typically used for irrigating non-turf vegetation.

MICRO SPRAY. The application of irrigation water through small, low volume sprayer heads in order to minimize runoff losses. Micro sprays are typically used for irrigating non-turf vegetation. Individual micro spray heads typically operate less than 12 inches above ground level and typically deliver water in the range of 0.10 to 0.50 gallons per minute within a radius of five feet or less of the head.

MULCH. A protective covering of organic material, such as sawdust, wood chips, compost, or other vegetative matter, spread on the ground to reduce evaporation and increase water retention.

ODD-NUMBERED PROPERTIES. Properties with street addresses that end in odd-numbered digits, or other properties so designated for the purposes of these Standards through special arrangements with OWASA.

OVERALL WATER DEMAND. The total water demand for any given month, as projected by OWASA.

OWASA. The Orange Water and Sewer Authority.

POTABLE WATER. Treated water provided by OWASA that is suitable for drinking, cooking, and other domestic use. Water that is collected indoors in containers from indoor faucets or spigots that would otherwise be discharged into drainpipes while a user awaits the warming of the water for dishwashing, other washing, shaving, bathing, or showering is not considered to be potable water for the purposes of these Standards.

PRECIPITATION RATE. The amount of water applied per unit of time, usually expressed in inches per hour.

PUBLIC PURPOSE ATHLETIC OR RECREATIONAL FIELD. An athletic or recreational field owned or leased by a public or not-for-profit entity and which is (a) operated for the use of the public pursuant to general invitation, and (b) not operated for the purpose of profit. For purposes of this definition, a golf course is not considered to be a public purpose athletic field or recreational field.

PUBLIC PURPOSE BOTANICAL SITE. A landscaped area which is owned or leased by a public or not-for-profit entity in which a variety of plants are grown to be categorized and documented for scientific purposes and/or which may also be open to the public for entertainment and educational purposes.

PUBLIC RIGHT-OF-WAY. The area of land owned or maintained by municipal, county, or state government primarily for the use of the public for the movement of people, goods, vehicles, or storm water. For the purposes of these Standards, the public right-of-way shall include curbs, streets, sidewalks, and storm water drainage inlets, but shall not include adjacent landscaped areas that also may be located within the legally delineated public right-of-way.

RAIN BARREL: A tank or container, typically located on the ground beneath a roof drainage system, that captures and stores rainwater for subsequent reuse.

RAW WATER. Water drawn from a reservoir or other water source before treatment.

RECLAIMED WATER. Highly treated effluent from a wastewater treatment plant that can be safely used for non-potable purposes approved by applicable regulatory agencies.

RUNOFF. Water that is not absorbed by the soil or landscape to which it is applied. Runoff occurs when water is applied too quickly (application rate exceeds infiltration rate), particularly if there is a severe slope. These Standards do not apply to stormwater runoff which is created by natural precipitation rather than human-caused or applied water use.

SERVICE AREA. The geographic area in which OWASA provides or is authorized to provide water and/or sewer service.

SHUT-OFF NOZZLE. A device attached to the end of a hose that completely shuts off the flow, even if left unattended.

SOAKER HOSE. A flexible hose designed to emit a trickle of water along its entire length, either through numerous small-diameter (less than 1/32-inch) perforations or through the permeable material of its composition.

SPRAY IRRIGATION. The application of water to landscaping by means of a device, other than a hand-held hose or watering container, that projects water through the air in the form of small particles or droplets.

SPRINKLER HEAD. A device that projects water through the air in the form of small particles or droplets.

UNDERGROUND SYSTEM. An irrigation system with emitters installed beneath the ground surface.

WATER CONSERVATION PLAN (OWASA-APPROVED). A written document submitted by the owner or operator of a public purpose athletic field, recreational field, and/or a public purpose botanical site and approved by OWASA's Executive Director or his/her designee that specifies the conservation measures and irrigation operating modes that will be employed year-round at those public purpose facilities and the specific practices that will be employed to achieve Stage 1, 2, and 3 Water Shortage conservation goals enumerated in these Standards.

WATER WASTE. The non-beneficial use of OWASA potable water. Non-beneficial uses include but are not restricted to:

- a. Landscape water applied in such a manner, rate and/or quantity that it overflows the landscaped area being watered and runs onto adjacent property or public right-of-way; or landscape water applied during periods of rainfall or when soil moisture is already adequate.
- b. The use of water for washing vehicles, equipment, or hard surfaces, such as parking lots, aprons, pads, and driveways in such quantities to flow onto adjacent property or the public right-of-way.

- c. Water applied in sufficient quantity to cause ponding on impervious surfaces.
- d. Water lost through plumbing leaks that can be readily identified and corrected.

WATERING BAG. A container used to hold and slowly dispense water around the base of a tree or shrub. These are commonly called “Gators.”

XERISCAPING. An approach to landscape design and maintenance that uses small amounts of water but sustains a traditional look through the proper conditioning of soil, the selection of appropriate drought-tolerant plants, generous use of mulch, efficient use of water, and other proven techniques.

Article II – Water Waste Prohibited, Penalties for Violating Standards

II. A. Water Waste Prohibited

No person, party, or entity shall use, cause, waste, or permit to be wasted any OWASA-supplied potable water in violation of the Standards set out herein.

II. B. Penalties

OWASA may discontinue water service to any customer where, after notice of a prohibited use is delivered to the service address, OWASA-supplied potable water continues to be used or wasted in violation of the Water Conservation Standards set out herein.

Article III – Year-Round Requirements, Policy and Practice

III. A. Exterior Use

1. The following outdoor or exterior use requirements shall apply to all customers using OWASA-supplied potable water:
 - a. Spray irrigation shall not occur more than three days per week. Even-numbered properties may be irrigated with spray systems only on Sundays, Wednesdays, and/or Fridays. Odd-numbered properties may be irrigated with spray systems only on Tuesdays, Thursdays, and/or Saturdays. All spray irrigation shall occur only between the hours of 6:00 p.m. and 10:00 a.m., and shall apply no more than one inch of water in any given week. These restrictions shall not apply to properties using underground, drip irrigation, micro spray, low precipitation bubblers, soaker hoses, hand watering, tree or shrub watering bags, or where watering of containerized plants and commercial plant stock in trade is maintained for resale.

- b. All irrigation systems shall be equipped with automatic controllers that activate the system according to a desired frequency and duration, and shall also be equipped with rain or soil moisture sensors that will prevent irrigation during periods of rainfall or when there is sufficient moisture in the ground for plant health and survival.
 - c. All hoses used for hand watering, vehicle washing, or other allowable outdoor uses shall be equipped with shutoff nozzles.
 - d. No exterior use of OWASA-supplied potable water shall result in the flow of water onto adjacent property or public right-of-way, and all irrigation systems shall be designed and maintained to prevent to the extent practicable water from flowing onto paved or other impervious surfaces.
 - e. Outdoor water leaks on property or facilities of OWASA customers shall be repaired within ten (10) days of discovery by the customer and/or notification by OWASA.
2. Owners of public purpose athletic fields, recreational fields, and/or public purpose botanical sites shall not be subject to the year-round limitations of III.A.1.a-e if those facilities are operated in compliance with an OWASA-approved Water Conservation Plan that specifies the conservation measures and irrigation operating modes to be employed at that facility year-round and during successive stages of a declared water shortage.
3. Unless superseded by the declaration of a Water Supply Shortage or Emergency, the year-round requirements of III.A.1.a and III.A.1.b above shall not apply to the following:
- a. Outdoor irrigation necessary for the establishment of newly sodded or seeded lawns and for the establishment of new non-turf plant materials within the first 45 days of planting, provided that such irrigation occurs only between the hours of 6:00 p.m. and 10:00 a.m.
 - b. Irrigation necessary for one day only where treatment with an application of chemicals requires immediate watering to preserve an existing landscape or to establish a new landscape, provided that such irrigation occurs only between the hours of 6:00 p.m. and 10:00 a.m.
 - c. Water used to control dust or to compact soil when alternate methods are not available.
 - d. Visually supervised operation of watering systems for short periods of time to check system condition and effectiveness.
 - e. Water used for construction or maintenance activities where the application of water is the appropriate methodology and where no other practical alternative exists.

- f. Water used for firefighting, firefighter training, fire hose testing, fire pumper testing, and other emergency situation mitigation purposes.
- g. For situations in which there is no practical alternative, OWASA-supplied potable water may be used for other special purposes, such as washing out garbage trucks, cleaning up hazardous or unsanitary materials, etc., or for other purposes necessary to protect public health, safety, and welfare – provided that such water is used in the least quantity needed to accomplish the task.

III. B. Interior Use

- 1. The following indoor or interior use requirements shall apply to all customers using OWASA-supplied potable water:
 - a. Restaurants and dining facilities shall serve water only upon request of the customer.
 - b. Hotels, motels, and other facilities providing sleeping accommodations shall change bed linens only upon request of the customer, or upon customer changeover, or every five days for long-term customers.
 - c. Indoor water leaks on property or facilities of OWASA customers shall be repaired within ten (10) days of discovery by the customer and/or notification by OWASA.
- 2. Unless superseded by the declaration of a Water Supply Shortage or Emergency, the year-round requirements of III.B.1. above shall not apply to the following:
 - a. Visually supervised operation and flushing of plumbing systems for short periods of time to check system condition and effectiveness.
 - b. Water used for construction or maintenance activities where the use of water is the appropriate methodology and where no other practical alternative exists.

III. C. Year-Round Policy and Practice

- 1. It shall be OWASA's policy and practice to publicize periodically water conservation methods, including but not limited to, methods of conserving water both indoors and outdoors; methods of collecting and storing harvested water in appropriate devices, such as rain barrels and cisterns; as well as information about the availability, feasibility and allowable uses of reclaimed water from OWASA. It shall be OWASA's policy to strongly encourage and promote the following voluntary conservation measures year-round, regardless of water supply conditions:

- a. Operate dishwashers and clothes washers only when loaded to their maximum capacity or at water level settings appropriate for the size of the load.
- b. Where not otherwise required, install ultra-low flow toilets, tank dams, flow restrictors (aerators) and low-flow showerheads.
- c. Repair and maintain plumbing systems to prevent water leaks.
- d. Use harvested rainwater and/or reclaimed water for indoor and outdoor purposes where allowable and practical.

Article IV – Determination of a Water Supply Shortage or Emergency

IV. A. Drought Condition Shortage

OWASA's drought response strategy and Water Supply Shortage declarations will be guided primarily by the risk that OWASA's water supplies will decline to 20 percent or less of total storage capacity within the next 12-month period. A Stage One Water Shortage declaration will generally correspond to a two percent (or greater) risk that reservoir levels will decline to 20 percent or less of total storage capacity within the next 12 months; provided, however, that in making such a determination, OWASA will also consider the actual and projected severity of the ongoing drought relative to historical droughts included in OWASA's water supply simulation models; existing and anticipated demand, including expected customer response to water use restrictions; availability of supplemental supplies, including water purchases from neighboring communities; regional water supply conditions, including, but not limited to, the concurrent drought response status of neighboring jurisdictions; guidance or directives from the State of North Carolina; and other elements of reasonable professional judgment and management.

More severe Water Supply Shortage Stages will subsequently be declared if the risk level increases and/or if other factors indicate that further action is needed. Similarly, OWASA will reduce the severity of, or rescind, a Water Supply Shortage declaration as the risk level and related factors improve.

IV. B. Water Treatment, Storage, or Distribution Capacity Shortage

In addition to conditions caused by drought, OWASA may declare a Water Supply Shortage or Emergency whenever customer demand – as averaged over three consecutive days – exceeds 85 percent of OWASA's capability of treating and delivering water. The stage and duration of such a Water Supply Shortage or Emergency shall be guided by the degree to which customer demands approach or exceed OWASA's capacity to meet those demands, and by the degree to which conservation efforts successfully reduce short-term demands.

IV. C. Disasters and Catastrophic Equipment or Plant Failure Shortage

Any other circumstances, including service losses caused by equipment or facility failure, human error, deliberate act, weather, or other natural disaster, which constrain OWASA's water supply, treatment, or distribution capacity to less than that reasonably needed by its customers, shall constitute a Water Supply Shortage up to and including a Water Supply Emergency, requiring immediate action by OWASA.

Article V – Required Actions Under Water Supply Shortage or Emergency Conditions

In the event of a water supply shortage, OWASA shall, using its best professional judgment, determine which of the following stages is the most appropriate response to the estimated level of risk considering factors in IV.A above.

V. A. Stage One (1) Water Shortage

In the event that OWASA declares a Stage One Water Shortage, OWASA shall advise the Mayors of Carrboro and Chapel Hill and the Chair of the Orange County Board of Commissioners of its declaration and shall request that they issue Proclamations of a Stage One Water Supply Shortage. Upon OWASA's declaration of a Stage One Water Shortage, the following actions shall be taken with the goal of reducing overall water demand by ten (10) percent:

1. Spray irrigation of turf grass using OWASA-supplied potable water shall not occur more than one day per week with a maximum of one-half inch of water applied to plant material in any given week. Odd-numbered properties shall be allowed to spray irrigate only on Tuesdays; even-numbered properties shall be allowed to spray irrigate only on Thursdays. Spray irrigation of turf grass shall occur only between the hours of 6:00 p.m. and 10:00 a.m. Owners of public purpose athletic fields, recreational fields, and/or public purpose botanical sites shall not be subject to the limitations of this subsection V.A.1 if those facilities are operated in compliance with an OWASA-approved Water Conservation Plan.
2. Spray irrigation of non-turf plant materials may occur up to three days per week as provided under the year-round requirements specified in Section III.A.1.a.
3. Irrigation of non-turf plant materials by underground, drip irrigation, micro spray, low precipitation bubblers, soaker hose systems with automatic shutoffs, or by hand held hoses or watering cans may occur at any time or frequency.

Notwithstanding the restrictions specified in Sections V.A.1 through V.A.3, the protection of public health, safety, and welfare may, under special circumstances, require the use of limited amounts of OWASA-supplied potable water for such purposes as washing out garbage trucks, cleaning up hazardous or other materials. Such uses shall be permitted during declared Water

Shortages or Emergencies, provided that other practical alternatives are not available and water is used in the least practical amount.

V. B. Stage Two (2) Water Shortage

In the event that OWASA declares a Stage Two Water Shortage, OWASA shall advise the Mayors of Carrboro and Chapel Hill and the Chair of the Orange County Board of Commissioners of its declaration and shall request that they issue Proclamations of a Stage Two Water Supply Shortage, if not already issued. Upon OWASA's declaration of a Stage Two Water Shortage, the following actions shall be taken with the goal of reducing overall water demand by fifteen (15) percent:

1. Spray irrigation of turf grass with OWASA-supplied potable water shall not be permitted, except at public purpose athletic and recreational fields and public purpose botanical sites operating under OWASA-approved Water Conservation Plans.
2. Spray irrigation of non-turf plant materials shall not occur more than one day per week according to the schedule specified in Section V.A.1 and in quantities of no more than ½ inch per week, except at public purpose botanical sites operating under OWASA-approved Water Conservation Plans.
3. Irrigation of non-turf plant material by underground, drip irrigation, micro spray, low precipitation bubblers, soaker hose systems with automatic shutoffs, tree or shrub watering bags, or by hand held hoses or watering cans may occur at any time or frequency.
4. No OWASA-supplied potable water shall be used to re-fill ornamental fountains, ponds, and like devices; provided, however, that OWASA water may be used to fill and re-fill bird baths and other backyard-scale facilities used to support wildlife.
5. No OWASA-supplied potable water shall be used for washing vehicles, except at commercial or institutional car washes in which at least 50 percent of the water has either been recycled, is from a non- potable source, or is supplied by a well.
6. No OWASA-supplied potable water shall be used for cleaning or washing exterior building surfaces, decks, or paved areas, such as sidewalks, driveways, roadways, and parking lots. This restriction shall not apply to the cleaning of exterior building surfaces or decks prior to painting or re-painting.
7. No OWASA-supplied potable water shall be used for fire department training or equipment testing unless required by State or Federal regulations.

Notwithstanding the restrictions specified in Sections V.B.1 through V.B.7, the protection of public health, safety, and welfare may, under special circumstances, require the use of limited amounts of OWASA-supplied potable water for such purposes as washing out garbage trucks, cleaning up hazardous or other materials. Such uses shall be permitted during declared Water

Shortages or Emergencies, provided that other practical alternatives are not available and water is used in the least practical amount.

V. C. Stage Three (3) Water Shortage

In the event that OWASA declares a Stage Three Water Shortage, OWASA shall advise the Mayors of Carrboro and Chapel Hill and the Chair of the Orange County Board of Commissioners of its declaration and shall request that they issue Proclamations of a Stage Three Water Supply Shortage, if not already issued. Upon OWASA's declaration of a Stage Three Water Shortage, the following actions shall be taken with the goal of reducing overall water demand by twenty (20) percent:

1. The use of OWASA-supplied potable water for heating and/or cooling purposes shall be reduced in all but the most essential facilities to the extent practical in consideration of indoor air quality standards, weather conditions, and health and safety requirements.
2. No OWASA-supplied potable water shall be used for irrigation of turf grass, except for public purpose athletic and/or recreational fields and public purpose botanical sites operating under water conservation plans that have been approved by OWASA's Executive Director or by his/her designee.
3. No OWASA-supplied potable water shall be used for irrigating non-turf plant material unless applied (a) via hand held hoses or watering cans, watering bags, drip irrigation or soaker hoses, or (b) at public purpose botanical sites operating under OWASA-approved Water Conservation Plans.
4. OWASA-supplied potable water may be used to fill, re-fill, or top off swimming pools, or to fill or re-fill bird baths and other backyard-scale facilities used to support wildlife. OWASA supplied potable water shall not be used for any other outdoor purposes, except for emergency fire suppression or other activities necessary to maintain public health, safety, or welfare.
5. No bulk sale of potable OWASA water shall occur except for the wholesale transmission of potable OWASA water to neighboring communities, or for other purposes necessary to maintain public health, safety, or welfare.
6. No OWASA-supplied potable water may be used for washing any vehicles.
7. No OWASA-supplied potable water may be used for pressure washing building exteriors.
8. No OWASA-supplied potable water may be used for fire department training or equipment testing.

Notwithstanding the restrictions specified in Sections V.C.1 through V.C.8, the protection of public health, safety, and welfare may, under special circumstances, require the use of limited amounts of OWASA-supplied potable water for such purposes as washing out garbage trucks,

cleaning up hazardous or other materials. Such uses shall be permitted during declared Water Shortages or Emergencies, provided that other practical alternatives are not available and water is used in the least practical amount.

V. D. Water Supply Emergency

In the event that OWASA declares a Water Supply Emergency, OWASA shall so advise the Mayors of Carrboro and Chapel Hill and the Chair of the Orange County Board of Commissioners and shall request the issuance of a Proclamation of a Water Supply Emergency. In addition to those applicable measures listed above for a Stage Three Water Shortage, the following actions shall be taken upon OWASA's declaration of a Water Supply Emergency:

1. No OWASA-supplied potable water may be used for any outdoor purposes other than emergency fire suppression or other activities necessary to maintain public health, safety, or welfare.
2. No OWASA-supplied potable water shall be used to fill, refill or top off the water level in any private or public purpose swimming pool.
3. No OWASA-supplied potable water shall be used for the flushing or pressure testing of new distribution lines unless that water is returned to the OWASA water supply system through methods approved by OWASA. This restriction shall not apply to the testing of in-building fire control sprinkler systems
4. The use of OWASA-supplied potable water for heating and/or cooling purposes shall be reduced in all but the most essential facilities to the extent practical in consideration of indoor air quality standards, weather conditions, and health and safety requirements.
5. Water service may be discontinued or reduced to designated users or in designated portions of the OWASA service area in order to preserve the availability of water for essential public health and safety requirements, such as fire protection, hospitals, clinics, and other critical community needs.

APPENDIX B

EXAMPLE OF MAILINGS TO CUSTOMERS

As discussed in Section 4 of the WSRP, during a declared Water Shortage OWASA uses several methods to inform its customers of the consideration and implementation of water use restrictions in a shortage, including but not limited to:

- paid media advertising;
- e-mails using our distribution list for local and University officials, customers who have shared their e-mail addresses, etc.;
- news releases (by e-mail);
- reports and announcements in televised and other public meetings of the OWASA Board;
- posters in public facilities such as municipal offices; and
- website postings including water supply/demand/rain data that are updated on weekdays (and e-mailed to interested parties)

Following are examples of two information brochures that OWASA mailed directly to its customers during the 2007/2008 drought, and an example of an ad that was placed in a local newspaper during that drought.

(The water use restrictions and water rate surcharges have been revised since that drought.)

ADDITIONAL WATER USE RESTRICTIONS IN EFFECT DUE TO STAGE ONE WATER SHORTAGE

IMPORTANTE BOLETÍN INFORMATIVO SOBRE RESTRICCIONES EN EL USO DEL AGUA (NIVEL I); PARA SOLICITAR UNA TRADUCCIÓN EN ESPAÑOL, LLAME AL 537-4221 O ENVÍE UN CORREO ELECTRÓNICO A WEBMASTER@OWASA.ORG.

On September 27th, the OWASA Board of Directors declared a Stage One Water Shortage with the goal of reducing the community's water demand by at least 10%. We request and very much appreciate your help in conserving our drinking water during this extreme drought and throughout the year.

The extended dry weather has resulted in steady declines in our reservoir levels, and there has been essentially no water flow since early August in the creeks and streams that drain to the Cane Creek Reservoir and University Lake. Drinking water demand in September averaged about 11 million gallons per day (MGD), compared to the previously projected demand of about 9.6 MGD for September.

The Stage One mandatory water use restrictions listed below will be in effect until further notice.

Stage One Water Shortage Use Restrictions for OWASA Customers

- **Spray irrigation is limited to one day per week, and is allowed only before 9:00 AM and after 8:00 PM. Irrigation is limited to 1/2 inch per week. At even-numbered addresses, spray irrigation is allowed only on Tuesdays; at odd-numbered addresses, only on Thursdays.** These restrictions do not apply to watering of containerized plants and commercial plants for sale at local nurseries and businesses.
- Spray irrigation is defined as "The application of water to landscaping by means of a device that projects water through the air in the form of small particles or droplets." You can measure irrigation with a small container such as a tuna can. If you have an irrigation system, you may wish to have the control system adjusted and soil and rain sensors checked by a company that installs or maintains irrigation systems.
- Spray irrigation systems are required to have automatic timer systems and rain or soil moisture sensors, and hoses for outdoor use are required to have automatic shut-offs.
- Water waste is prohibited. Water waste includes using so much water that it runs onto adjacent properties or street rights-of-way or causes ponding on impervious surfaces; failing to fix leaks; and irrigation during rainfall or when soil moisture is already adequate.
- **If water use by an individually-metered residential customer or by an individually-metered single family residential irrigation-only customer exceeds an average of 1,000 gallons per day during any monthly billing cycle, OWASA MAY TERMINATE SERVICE.**
- The previous exemption for watering new plants, sod, seeding and reseeding of lawns is no longer in effect. That means the maximum amount of water that can be applied to a new lawn or landscaped area is limited to a total of one-half inch per week.
- Watering with a hand-held hose or watering can or with underground, drip irrigation, micro spray, soaker hose or low precipitation "bubbler" watering systems is allowed on any day of the week and at any time of day, but is limited to the maximum of one-half inch of water per week.
- No OWASA water may be used to re-fill ornamental fountains, ponds, and like devices.
- No OWASA water may be used for routine cleaning or washing of paved areas such as sidewalks, decks, driveways, roadways, or parking lots. (However, pressure cleaning of exterior building surfaces is allowed under the Stage One restrictions.)
- Hotels, motels, etc. shall change bed linens only upon request of the customer, upon customer changeover or every five days for long-term customers.
- Restaurants shall serve water only upon request.

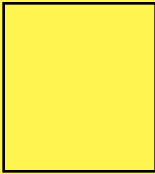
OWASA customers are strongly encouraged to conserve in other ways, such as:

- Taking shorter showers, not letting faucets run unnecessarily, and flushing the toilet only when necessary.
- Installing low-flush toilets and low-flow showerheads and faucet aerators where they are not already in place as required by current plumbing codes.
- Using rain barrels, cisterns, etc. to store rainwater for irrigation and other suitable purposes. Rain barrels are available at some retail outlets and local Boy Scout Troop #42 (telephone: 942-4830).
- Dishwashers and clothes washers should be used only with full loads or with water level settings appropriate for the load size.



400 Jones Ferry Road
Carrboro, NC 27510

IMPORTANT NOTICE: WATER USE RESTRICTIONS



WATER RATE SURCHARGES TO BEGIN IN NOVEMBER FOR HIGH RESIDENTIAL WATER USE (11,000 OR MORE GALLONS PER MONTH)

In addition to declaring the Stage One Water Shortage, the OWASA Board decided that surcharges for high residential water use will go into effect on November 1st. The surcharges are set forth in OWASA’s schedule of rates and fees for water and sewer service as approved in June, 2007.

As previously announced, OWASA’s new rates effective on October 1st will include increasing block water rates for individually-metered residential customers:

	Volume of Use	Water Rate
Block 1	1 – 2,999 gallons per month	\$1.98 per 1,000 gallons
Block 2	3,000 – 5,999 gallons per month	\$4.70 per 1,000 gallons
Block 3	6,000 – 10,999 gallons per month	\$5.53 per 1,000 gallons
Block 4	11,000 – 15,999 gallons per month	\$7.46 per 1,000 gallons
Block 5	16,000 or more gallons per month	\$13.05 per 1,000 gallons

(The typical residential OWASA customer uses about 6,000 gallons per month; water use over 10,000 gallons per month is very likely for outdoor purposes such as irrigation)

On November 1st, under the Stage One Water Shortage surcharges, the Block 4 water rate will increase to \$11.19 per 1,000 gallons (1.5 times the normal Block 4 rate) and the Block 5 water rate will increase to \$26.10 per 1,000 gallons (2 times the normal Block 5 rate). The surcharges are intended to strongly discourage high water use.

During a Stage One Water Shortage, there are no surcharges on water rate blocks 1 through 3 and there are no surcharges for non-residential and multi-family master-metered customers, who will pay seasonal water conservation rates rather than block rates. Additional and higher surcharges would apply if the OWASA Board declares a more severe water shortage.

THANK YOU VERY MUCH FOR YOUR HELP!

We sincerely appreciate your assistance in helping to conserve our essential drinking water supply during this extended drought and throughout the year. We welcome and encourage you to contact us for information about ways to conserve water, or to report actual or possible water leaks, water waste or water use that is not consistent with the conservation requirements.

Your conservation efforts now will help to reduce our community’s risk in the event the current drought continues in the months ahead.

TO CONTACT OWASA

Please call us at 968-4421; send e-mail to webmaster@owasa.org; visit our website, www.owasa.org; send a fax to 968-4464 or visit or write to us at 400 Jones Ferry Road, PO Box 366, Carrboro, NC 27510

OWASA is the community-owned, non-profit public water and sewer agency serving the Carrboro-Chapel Hill community.

WATER CONSERVATION:
part of our community’s SUSTAINABLE quality of life



STAGE 2 WATER SHORTAGE DECLARED; WATER USE RESTRICTIONS TIGHTENED

IMPORTANTE BOLETÍN INFORMATIVO SOBRE RESTRICCIONES EN EL USO DEL AGUA (NIVEL 2); PARA SOLICITAR UNA TRADUCCIÓN EN ESPAÑOL, LLAME AL 537-4221 O ENVIE UN CORREO ELECTRÓNICO A WEBMASTER@OWASA.ORG.

On October 18th, the OWASA Board declared a Stage Two Water Shortage with the goal of reducing water demand by at least 15%. The decision to declare the Stage Two Water Shortage was due to factors including:

As a result of the ongoing exceptional drought, reservoir levels and total water storage on hand have continued to decline and there has been no inflow to OWASA's reservoirs for more than two months.

The U.S. Drought Monitor rates the drought as "Exceptional," and continuation of the drought into 2008 is forecast.

The Cane Creek Reservoir and University Lake, which are the Carrboro-Chapel Hill-southeast Orange County community's primary public water sources, were about 50% full as of October 22, 2007.

Water demand in early and mid-October was well above the Stage One Water Shortage goal of 8.2 million gallons per day or less.

STAGE TWO WATER USE RESTRICTIONS

Spray irrigation with OWASA drinking water is not permitted, except by people regularly engaged in the sale of plants, who are allowed to irrigate their commercial stock in trade.

Irrigation by underground, drip irrigation, micro-spray, low precipitation bubblers, soaker hose systems with automatic shutoffs, or by hand held hoses or watering cans is limited to a maximum of one-half inch of water applied to plant material in any given week.

Water waste, which includes the following, is prohibited.

- 💧 Landscape watering applied in such a manner, rate and/or quantity that it overflows the landscaped area being watered and runs onto adjacent property or public right-of-way; or landscape water applied during periods of rainfall or when soil moisture is already adequate.
- 💧 The use of water for washing vehicles, equipment, or hard surfaces, such as parking lots, aprons, pads, driveways, or other surfaced areas, in such quantities to flow onto adjacent property or the public right-of-way.
- 💧 Water applied in sufficient quantity to cause ponding on impervious surfaces.
- 💧 Water lost through plumbing leaks that can be readily identified and corrected.

Water use by individually metered residential customer accounts and by individually metered single-family residential irrigation-only accounts is limited to no more than an average of 800 gallons per day during any monthly billing cycle beginning after the declaration of the Stage Two Water Shortage and ending while such restrictions are still in effect. **OWASA MAY TERMINATE SERVICE FOR WATER USE OVER THE 800 GALLON PER DAY LIMIT.**

Water shall not be used for washing vehicles, except at commercial or institutional car washes where at least 50 percent of the water is recycled.

Water shall not be used for filling or re-filling empty swimming pools. OWASA drinking water may be used to top off operating swimming pools.

Water shall not be used to re-fill ornamental fountains, ponds, and like devices.

Water shall not be used for the routine cleaning or washing of exterior building surfaces, decks or paved areas such as sidewalks, driveways, roadways, and parking lots. This restriction shall not apply to the pressure cleaning of exterior building surfaces or decks before painting or re-painting that is necessary to protect or maintain the physical integrity of the structure.



400 Jones Ferry Road
Carrboro, NC 27510

**IMPORTANT NOTICE:
STAGE TWO WATER SHORTAGE
AND WATER USE RESTRICTIONS**

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Chapel Hill, NC
Permit #251

(continued from other side)

Restaurants and dining facilities shall serve water only on request of the customer.

Hotels, motels, and other facilities providing sleeping accommodations shall change bed linens only upon request of the customer, or upon customer changeover, or every five days for long-term customers.

The operation of dishwashers and clothes washers only when loaded to their maximum capacity, or at water level settings appropriate for the size of the load being washed; and installation of ultra-low flush toilets, tank dams, faucet aerators and low-flow shower heads are strongly encouraged if not already required.

Water leaks must be repaired within 10 days of notification by OWASA.

STAGE TWO SURCHARGES TO BEGIN IN NOVEMBER FOR HIGH RESIDENTIAL WATER USE

Stage Two surcharges for high water use by individually-metered residential customers will go into effect on November 1st. (Previously, Stage One water surcharges had been approved to go into effect on November 1st.)

OWASA’s current block water rates are:

OCTOBER 1 BLOCK WATER RATES

Block 1	1 – 2,999 gallons per month	\$1.98 per 1,000 gallons
Block 2	3,000 – 5,999 gallons per month	\$4.70 per 1,000 gallons
Block 3	6,000 – 10,999 gallons per month	\$5.53 per 1,000 gallons
Block 4	11,000 – 15,999 gallons per month	\$7.46 per 1,000 gallons
Block 5	16,000 or more gallons per month	\$13.05 per 1,000 gallons

A typical residential OWASA customer uses about 5,500 gallons per month.

ON NOVEMBER 1:

The block 3 water rate will increase to \$8.295 per 1,000 gallons.
The block 4 water rate will increase to \$14.92 to per 1,000 gallons.
The block 5 water rate will increase to \$39.15 per 1,000 gallons.

The surcharges are intended to strongly discourage high water use. During a Stage Two Water Shortage, there are no surcharges on water rate blocks 1 and 2 and there are no surcharges for non-residential and multi-family master-metered customers, who will pay seasonal water conservation rates rather than block rates. Additional and higher surcharges would apply in more severe water shortage conditions.

THANK YOU VERY MUCH FOR YOUR HELP!

We sincerely appreciate your assistance in helping to conserve our essential drinking water supply during this extended drought and throughout the year. We welcome and encourage you to contact us for information about ways to conserve water, or to report actual or possible water leaks, water waste or water use that is not consistent with the conservation requirements. Your conservation efforts now will help to reduce our community’s risk in the event the current drought continues in the months ahead.

TO CONTACT OWASA

Please call us at 968-4421; send e-mail to webmaster@owasa.org; visit our website, www.owasa.org; send a fax to 968-4464 or visit or write to us at 400 Jones Ferry Road, PO Box 366, Carrboro, NC 27510.

*OWASA is the community-owned, non-profit public water and sewer agency
serving the Carrboro-Chapel Hill community.*

THE DROUGHT AND OUR WATER SUPPLIES

How much water do we have now?

As of Thursday, November 29th, our Cane Creek Reservoir, University Lake and Stone Quarry Reservoir were about 47% full with a total of 1.665 billion gallons. Based on average water demand of 7.6 million gallons per day in the last 30 days, we have an estimated 6 to 7 months of supply assuming no rainfall.

Since we have several months of supply on hand, why is conservation important?

- We are in a severe drought as is much of the southeast U.S. and rainfall continues to be well below normal. There is essentially no water flow in the streams and creeks that feed our reservoirs.
- The National Weather Service has forecast that the drought will continue into 2008 due to La Niña conditions in the Pacific.
- Although winter and early spring rains would refill our reservoirs under normal conditions, we cannot assume that will happen in 2008. We need to continue conserving to help ensure that we will have an adequate supply in 2008.

What are the current water use restrictions?

Stage Two restrictions on use of OWASA drinking water include a ban on spray irrigation (except by businesses that regularly sell plants, which may water their inventory). However, we strongly recommend using water only for essential purposes.

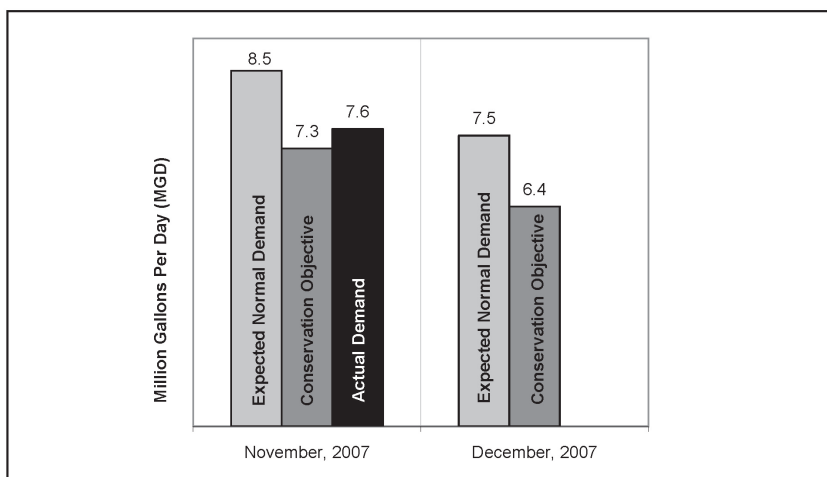
For a complete list of current restrictions or if you have any questions or comments, please contact OWASA at 968-4421 or webmaster@owasa.org, or visit our website, www.owasa.org.

Are water rate surcharges in effect?

Yes. Stage Two water rate surcharges have been in effect since November 1 for water use at or above 6,000 gallons per month at individually-metered residences. The average single-family residential customer in our community uses about 5,500 gallons per month. (The current surcharges do not apply to non-residential customers or master-metered multi-family locations.) For more detailed information, please contact OWASA at 968-4421 or by e-mail to webmaster@owasa.org, or visit our website, www.owasa.org.

What is our present water conservation objective?

Our objective for December is 6.4 million (or fewer) gallons per day or 15% below normal demand for December. Demand in November averaged about 7.6 million gallons per day, so more conservation is needed.



What are the most important conservation opportunities?

- Based on a national study of water use, about 31% of indoor residential water use is for toilet flushing. Therefore, flush less often and reduce an old toilet's flush volume by putting a container of water in the tank or installing a quick-closing flapper available free from OWASA at 400 Jones Ferry Road, Carrboro.
- Consider replacing old toilets with one that uses only 1.28 gallons (a "high efficiency" toilet) or 1.6 gallons (the plumbing code standard since 1994) per flush. Toilets installed before 1980 typically use 5 or more gallons per flush and toilets installed in the 1980s and early 1990s likely use 3.5 gallons per flush. New toilets may pay for themselves in a few years!
- About 25% of indoor residential water use is for clothes washing and 2% is for washing dishes. Wash clothes and dishes only when there is a full load. If you are ready to replace your clothes washer, choose a water- and energy-efficient front-loading model. Water-efficient dishwashers are also available. Please visit the EPA's WaterSense website, www.epa.gov/owm/water-efficiency/pp/het.htm, for information on independently certified water-saving fixtures, appliances, etc.
- Showers and baths account for 21% of indoor residential water use. Take short showers and install water-saving showerheads if you do not already have them. We give away low flow showerheads at our office in Carrboro.
- Faucet use totals about 18% of indoor residential water use. Don't leave the water running when it is not needed while you wash your hands, etc.
- Regularly check plumbing pipes, hoses and fixtures for leaks. Toilets are a very common place for leaks. To check a toilet, put food dye in the tank and do not flush for 15 to 20 minutes. If dye appears in the bowl, there is a leak, probably at the flapper.
- Cease non-essential outdoor use of OWASA drinking water if you have not already.

Questions or comments?

If you have questions or comments, or to report water waste, please call us at 968-4421, send e-mail to webmaster@owasa.org or visit our website, www.owasa.org.

Orange Water and Sewer Authority

400 Jones Ferry Road, Carrboro, NC
968-4421; webmaster@owasa.org; www.owasa.org



**WATER CONSERVATION: part of our community's
SUSTAINABLE quality of life**

APPENDIX C

DROUGHT RESPONSE OPERATING PROTOCOL

DROUGHT RESPONSE OPERATING PROTOCOL

JANUARY 10, 2013

Purpose

To describe the procedures and criteria that OWASA will use for making water supply and demand management decisions during an extended drought, including provisions for public notice of potential Water Supply Shortage declarations, water purchases, and/or use of OWASA's Jordan Lake water supply storage allocation. The protocol outlined below will provide OWASA's customers, local elected boards, and the overall Carrboro-Chapel Hill-UNC community with timely notice of a potential water shortage due to extended drought and the opportunity to reduce water consumption in order to avoid and/or minimize the need for more severe water use restrictions or emergency actions.

The statistically derived drought responses described below were based on the risk of depleting OWASA's existing Cane Creek/University Lake/Quarry Reservoir system to the Emergency Storage level. Those risks do not assume that Jordan Lake is part of OWASA's existing or primary water supply portfolio (University Lake, Cane Creek Reservoir, and Quarry Reservoir); instead, Jordan Lake is only an "insurance policy" for use during extended drought or operational emergencies.

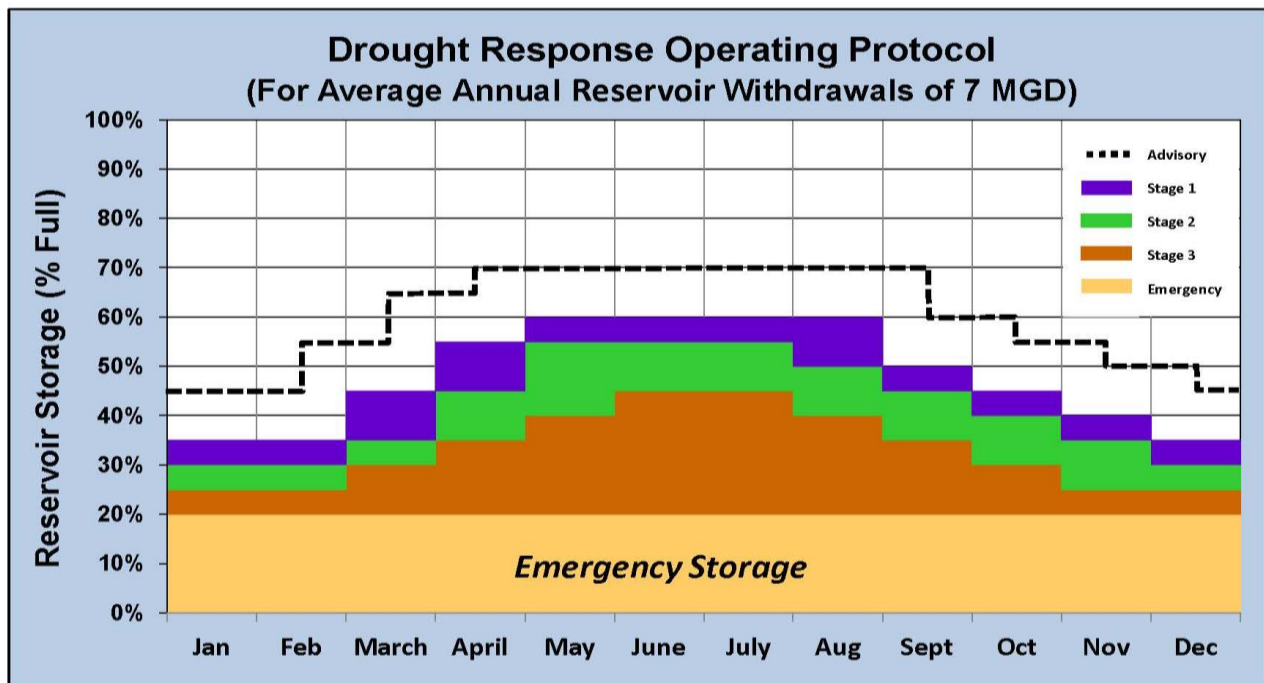
Protocol

1. OWASA shall monitor OWASA's water supply and demand conditions, short-and long-term weather forecasts, regional water supply conditions, and other factors which may affect the risk of a water supply shortage due to drought.
2. The attached graph, which is a modified version of the 7 million gallon per day (mgd) "trigger table"* in OWASA's State-approved *Water Shortage Response Plan*, shall guide OWASA's drought response decisions when raw water demands are at an annual average of 7 mgd. (When annual average demands are greater than 7 mgd, the corresponding trigger table graphs from the *Water Shortage Response Plan* shall be used.) Any drought-related Water Supply Shortage declaration at storage levels above those indicated on the trigger table, and/or any decision to purchase water from a neighboring jurisdiction (and/or to use OWASA's Jordan Lake allocation) during a drought, shall be made only upon approval by the OWASA Board of Directors.
3. OWASA shall declare a Water Shortage Advisory no later than when the total water stored in the reservoirs drops to within 10% of the mandatory Stage 1 trigger. (This Advisory stage is represented by the black dashed line on the attached graph). At or around that time, OWASA will initiate communications with the Carrboro Board of Aldermen, Chapel Hill Town Council, Orange County Board of Commissioners, and the University of North Carolina at Chapel Hill – and shall give public notice to customers and other stakeholders – regarding the likelihood that Stage 1 water use restrictions will go into effect, and that it may be necessary to begin purchasing water from the City of Durham and/or Town of Cary if current drought conditions continue or worsen. OWASA will carefully consider the advice and feedback from the elected boards. The OWASA Board of Directors will continue to exercise its sole responsibility and authority for decisions about water shortage declarations and water purchases, consistent with this Protocol. As in the past, OWASA will expand its standard conservation messaging before declaring the Water Shortage Advisory in order to encourage

* *The graph is based on an average daily raw water demand of 7 mgd. Trigger levels for greater or lesser demands will be correspondingly higher or lower than those depicted here.*

and to give the community as much opportunity as possible to intensify its water saving practices.

4. When total water storage in OWASA's reservoirs system declines to the purple block on the attached graph, OWASA must declare a Stage 1 Shortage as required by its State-approved *Water Shortage Response Plan*. OWASA may, at its own discretion, initiate Stage 1 use restrictions – with or without corresponding drought rate surcharges – earlier than indicated on the graph, but not later. The OWASA Board may authorize purchases from other utilities and/or obtain water through its Jordan Lake allocation only when total water storage in University Lake, Cane Creek Reservoir, and the Quarry Reservoir is below the Mandatory Stage 1 Shortage trigger, but no sooner. Board approval for such a declaration or purchase decision shall not be required, however, during an operational emergency as determined by OWASA's Executive Director per OWASA's *Water Shortage Response Plan*. Operational emergencies are typically characterized by the need for rapid response and may require the curtailment of water use and/or purchases in a short period of time. Examples of such emergencies include, but are not limited to:
 - Production problems at the Jones Ferry Road Water Treatment Plant
 - Failure of pumps, storage tanks, or pipelines
 - Raw or treated drinking water quality problems
 - Planned or unplanned maintenance events
 - Natural disasters.
5. During an extended drought, OWASA staff will initiate discussions with the Board of Directors regarding the need and timing of commencing water purchases or other prudent actions as total water in storage approaches the mandatory Stage 1 trigger levels shown on the attached graph; however, no purchase or use of OWASA's Jordan Lake allocation shall be made without explicit approval by the Board of Directors (except during Operational Emergencies as described above in Paragraph 4). Restrictions shall, and purchases may, continue until storage returns to levels above the mandatory Stage 1 trigger. Water use restrictions shall continue until storage returns to the "rescission" levels specified in the *Water Supply Shortage Response Plan*.
6. OWASA shall provide regular updates to the community and to the local elected boards throughout the drought as described in Paragraph 3 above. The OWASA Board and staff shall be available to attend meetings of the local governments to provide information about supply and demand conditions and to provide any information or answer questions elected officials may have.
7. The OWASA Board shall review this protocol (a) concurrently with its review of OWASA's State-approved *Water Shortage Response Plan* (as required in conjunction with Local Water Supply Plan updates that must be submitted to the NC Division of Water Resources at least once every five years); (b) following any drought during which mandatory water use restrictions were implemented; and/or (c) at any time deemed necessary to reflect changes in water supply and demand conditions or other new information, such as when the expanded Quarry Reservoir comes on line.



These responses are based on the risk of depleting OWASA's existing Cane Creek/ University Lake/Quarry Reservoir system to the Emergency Storage level and are consistent with the Response Triggers of OWASA's State-approved Water Shortage Response Plan. Those risks do not consider Jordan Lake to be part of OWASA's existing or primary water supply (University Lake, Cane Creek, and Quarry Reservoirs), but only as an "insurance policy" for use during extended drought or emergency conditions.

Water Shortage Advisory: Aggressive public awareness/education effort, including direct communication with the Carrboro, Chapel Hill, and Orange County elected boards and the University of North Carolina at Chapel Hill. A Water Shortage Advisory may be initiated earlier at OWASA's discretion.

Stage 1 Shortage: Mandatory use restrictions -- with or without rate surcharges -- may be initiated earlier at OWASA's discretion, but not later. The OWASA Board may authorize purchases of water from other utilities and/or obtain water through its Jordan Lake allocation only when total water storage in University Lake, Cane Creek Reservoir, and the Quarry Reservoir is below this Mandatory Stage 1 trigger, but not sooner. Board approval for such a declaration or purchase decision shall not be required, however, during an operational emergency as determined by the Executive Director per OWASA's *Water Shortage Response Plan*.

Stage 2 Shortage: May be initiated earlier at OWASA's discretion, but not later.

Stage 3 Shortage: May be initiated earlier at OWASA's discretion, but not later.

Water Supply Emergency: Emergency actions will be taken to obtain supplemental water to ensure the protection of public health, safety and welfare. If Cane Creek/University Lake/Quarry Reservoir storage declines to this level, such actions would likely include the installation of temporary facilities to pump water from the Haw River to the Cane Creek Reservoir.

RESOLUTION ADOPTING A DROUGHT RESPONSE OPERATING PROTOCOL

WHEREAS, OWASA is responsible for providing current and future customers with a reliable, sustainable, and cost-effective supply of high quality drinking water at all times and is committed to making the highest and best use of our local water resources; and

WHEREAS, OWASA's role with respect to growth is explicitly addressed in its *Mission Statement*: "We will manage our responsibilities in a manner consistent and compatible with the adopted growth management policies and land use plans of the Town of Carrboro, the Town of Chapel Hill, and Orange County"; and

WHEREAS, OWASA's water use efficiency, conservation, and reclaimed water programs, which are key components of its sustainable resource management strategy, have successfully and consistently reduced water consumption during the past ten years among all customer groups; and

WHEREAS, notwithstanding these significant community-wide achievements in water use reduction, OWASA's University Lake, Cane Creek, and Quarry Reservoir supplies will be increasingly susceptible to shortages during extended periods of severe drought, especially until the expanded Quarry Reservoir is available in the mid 2030s; and

WHEREAS, it is OWASA's duty to proactively plan and prepare for water supply shortages due to extended periods of severe drought; and

WHEREAS, OWASA's *Water Shortage Response Plan* (November 11, 2010), as approved by the North Carolina Division of Water Resources, includes Response Triggers for a range of supply and demand conditions and describes the actions that OWASA will take during periods of water shortages; and

WHEREAS, community members and elected officials from Carrboro and Chapel Hill have requested clarification of the procedures and criteria that OWASA will use for making water supply and demand management decisions during extended periods of severe drought, including provisions to assure prompt and complete public notice of potential Water Supply Shortage declarations, water purchases, and/or the use of OWASA's Jordan Lake water supply storage allocation.

NOW, THEREFORE, BE IT RESOLVED BY THE BOARD OF DIRECTORS OF ORANGE WATER AND SEWER AUTHORITY THAT:

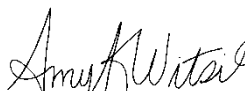
OWASA shall use the *Drought Response Operating Protocol* text and graph attached hereto as its procedures and criteria for making water supply and demand management decisions during periods of extended drought, including provisions for public notice of potential Water Supply Shortage declarations, water purchases, and/or use of OWASA's Jordan Lake water supply storage allocation.

Adopted this 10th day of January 2013.



Alan E. Rimer, P.E., Chair

ATTEST:



Amy Witsil, Secretary

APPENDIX D

RESOLUTIONS APPROVING OWASA'S WATER SHORTAGE RESPONSE PLAN

RESOLUTION APPROVING OWASA'S WATER SHORTAGE RESPONSE PLAN

WHEREAS, North Carolina General Statute 143-355(l) requires that each unit of local government that provides public water services or plans to provide such services shall, either individually or together with other such units of local government, prepare and submit a Water Shortage Response Plan; and

WHEREAS, as required by said statute and in the interest of sound local water supply planning and management, OWASA has developed a Water Shortage Response Plan; and

WHEREAS, the proposed Plan incorporates the Water Conservation Standards approved by OWASA in 2009 following an extensive public input process; and

WHEREAS, the OWASA Board of Directors finds that the Water Shortage Response Plan meets the requirements of North Carolina General Statute 143-355(l) and that said Plan will provide appropriate guidance for the future management of OWASA's water supplies, as well as useful information to the North Carolina Department of Environment and Natural Resources (NCDENR) for the development of a State water supply plan as required by statute;

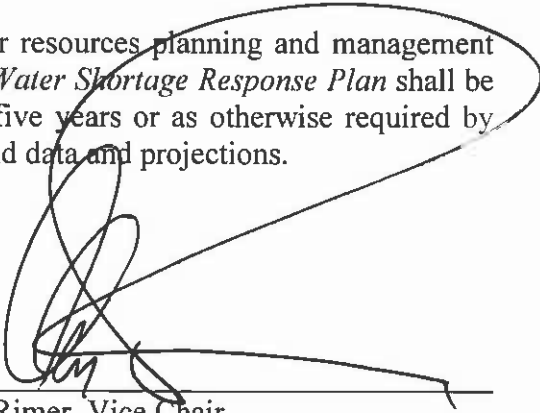
NOW, THEREFORE, BE IT RESOLVED:

1. The Board of Directors hereby approves and adopts the *OWASA Water Shortage Response Plan* dated November 11, 2010 and attached hereto and made part of this Resolution.

2. The Executive Director shall submit OWASA's plan to NCDENR's Division of Water Resources, and copies shall be provided to the managers of the Town of Carrboro, Town of Chapel Hill, and Orange County.

3. In accordance with State law and sound water resources planning and management practice, the Board of Directors intends that the *OWASA Water Shortage Response Plan* shall be reviewed and revised, as necessary, at least once every five years or as otherwise required by law, to reflect changes in relevant water supply and demand data and projections.

Adopted this 11th day of November, 2010.


Alan Rimer, Vice Chair

ATTEST:


Braxton Foushee, Secretary

**RESOLUTION APPROVING OWASA'S 2012 LOCAL WATER SUPPLY PLAN AND
WATER SHORTAGE RESPONSE PLAN UPDATE SUBMITTED TO THE NC
DEPARTMENT OF ENVIRONMENT AND NATURAL RESOURCES, DIVISION OF
WATER RESOURCES**

WHEREAS, North Carolina General Statute (NCGS) 143-355(1) requires that each unit of local government that provides public water services or plans to provide such services shall, either individually or together with other such units of local government, prepare and submit a Local Water Supply Plan that must be revised at least once every five years; and,

WHEREAS, 15A NCAC 02E 0.0606 requires each such unit of local government to develop a Water Shortage Response Plan for incorporation into its Local Water Supply Plan; and,

WHEREAS, in March 2013 Orange Water and Sewer Authority (OWASA) staff submitted a draft 2012 Local Water Supply Plan to the Department of Environment and Natural Resources, Division of Water Resources (DWR) in accordance with NCGS 143-355(1); and,

WHEREAS, on November 20, 2014, DWR approved OWASA's 2012 Local Water Supply Plan; and,

WHEREAS, on April 8, 2010 the OWASA Board of Directors adopted a *Long-Range Water Supply Plan, Final Report* (subsequently revised through January 25, 2013) that was developed by OWASA staff and consultants to serve as the Board's principal guide for future water supply policy and investment decisions; and,

WHEREAS, said *Long-Range Water Supply Plan* (as revised through January 25, 2013) is consistent with OWASA's 2012 Local Water Supply Plan originally submitted to DWR in March 2013 (as updated annually through April 2014); and,

WHEREAS, the 2012 Local Water Supply Plan cannot be considered compliant with NCGS 143-355(1) until DWR receives a Resolution of Approval by the OWASA Board of Directors; and

WHEREAS, OWASA submitted and DWR approved OWASA's Water Shortage Response Plan in September 2012; and

WHEREAS, in November 2010, the OWASA Board of Directors approved OWASA's Water Shortage Response Plan; and

WHEREAS, the OWASA Board of Directors adopted a Drought Response Operating Protocol in January 2013 to describe procedures and criteria OWASA will follow for making water supply and demand management decisions; and

WHEREAS, the Drought Response Operating Protocol is consistent with the Water Shortage Response Plan; and

WHEREAS, OWASA would like to update its Water Shortage Response Plan to include the Drought Response Operating Protocol; and

WHEREAS, OWASA desires to update its Water Shortage Response Plan on the same schedule as obtaining a Resolution of Approval for the Local Water Supply Plan by the OWASA Board of Directors and has accordingly updated its Water Shortage Response Plan to include the Drought Response Operating Protocol.

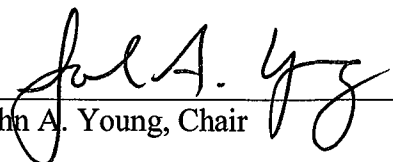
NOW, THEREFORE, BE IT RESOLVED BY THE OWASA BOARD OF DIRECTORS THAT:

1. OWASA's 2012 Local Water Supply Plan as submitted to DWR in March 2013 is hereby approved for the purposes of NCGS 143-355(l) and the OWASA Board intends that this plan shall be revised to reflect changes in relevant data and projections at least once every five years or as otherwise requested by DWR, in accordance with the statute and sound planning practice; and,

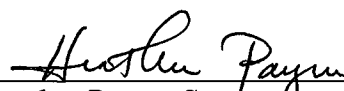
2. OWASA's Water Shortage Response Plan as updated in January 2015 is hereby approved for the purposes of NCGS 143-355(l) and the OWASA Board of Directors intends that this plan shall be reviewed and revised as needed, which will be at least once every five years; and,

3. Not inconsistent with the requirements of NCGS 143-355(l) and 15A NCAC 02E 0.0600 OWASA's 2010 *Long-Range Water Supply Plan Final Report* (as revised through January 25, 2013) or its update remains the principal guide for future water supply policy and investment decisions of the Orange Water and Sewer Authority.

Adopted this 22nd day of January, 2015.


John A. Young, Chair

ATTEST:


Heather Payne, Secretary

Resolution Approving OWASA's 2017 Local Water Supply Plan and (Revised) Water Shortage Response Plan as Approved by the NC Department of Environmental Quality, Division of Water Resources

Whereas, North Carolina General Statute (NCGS) 143-355(1) requires that each unit of local government that provides public water services shall, prepare and submit a Local Water Supply Plan, and that such Plans be revised at least once every five years; and

Whereas, NCGS 143-355(1) also requires each such unit of local government to develop a Water Shortage Response Plan for incorporation into its Local Water Supply Plan; and

Whereas, in March 2018 Orange Water and Sewer Authority (OWASA) staff submitted a draft 2017 Local Water Supply Plan to the Department of Environmental Quality, Division of Water Resources (DWR) for its review and approval, in accordance with NCGS 143-355(1); and

Whereas, on April 18, 2018, DWR approved OWASA's 2017 Local Water Supply Plan; and

Whereas, the 2017 Local Water Supply Plan must be approved and adopted by the OWASA Board of Directors after DWR approval in order to be compliant with NCGS 143-355(1); and

Whereas, OWASA has concurrently updated, and DWR has approved, its Water Shortage Response Plan; and

Whereas, OWASA desires to update and obtain approvals for its Water Shortage Response Plan on the same schedule of five-year renewals as that exercised for obtaining updates and approvals for its Local Water Supply Plan, and accordingly, has updated and requested approval of its Water Shortage Response Plan, and DWR has approved this update as of May 2018;

Now, Therefore, Be It Resolved By the OWASA Board of Directors That:

1. OWASA's 2017 draft of its Local Water Supply Plan as approved by DWR in April 2018, is hereby approved and adopted for the purposes of NCGS 143-355(1), and the OWASA Board intends and directs that this plan should be revised to reflect changes in relevant data and projections at least once every five years or as otherwise requested by DWR, in accordance with the statute and sound planning practice.

2. OWASA's Water Shortage Response Plan as approved by DWR in May 2018 is hereby approved and adopted for the purposes of NCGS 143-355(1), and the OWASA Board of Directors intends and directs that this plan shall be reviewed and revised as needed, which will be at least once every five years; or otherwise as requested by DWR, in accordance with the statute and sound planning practice.

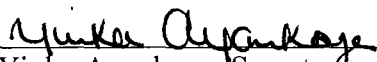
Resolution Approving OWASA's 2017 Local Water Supply Plan and (Revised) Water
Shortage Response Plan
June 14, 2018
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Adopted this 14th day of June 2018.



Heather Payne, Vice Chair

ATTEST:



Yinka Ayankoya, Secretary