
FINAL

2015 Interbasin Transfer Certificate

Drought Management Plan

Prepared for
Town of Cary
Town of Apex

Submitted to
North Carolina
Division of Water Resources

July 2015



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Drought Management Plan

1.1 Introduction

On March 12, 2015, the North Carolina Environmental Management Commission (EMC) granted an interbasin transfer (IBT) certificate modification to the Towns of Cary and Apex (Towns) with transfer limits of 31 million gallons per day (mgd) from the Haw River basin to the Neuse River basin, and 2 mgd from the Haw River basin to the Cape Fear River basin, calculated as a daily average of a calendar month. In addition to the permitted transfer volume, the IBT certificate included a condition that requires the development of a Drought Management Plan that specifies how the IBT shall be managed to protect the source river basin (Haw River basin) during drought conditions or other emergencies that occur within the source river basin.

Currently, the Towns both have Water Shortage Response Plans (WSRPs), as required by North Carolina General Statute (NCGS) 143-355(l). The rules governing water use during droughts and water emergencies (15A North Carolina Administrative Code [NCAC] 02E. 0607) stipulate specific items that must be included in those plans. The Towns' WSRPs were developed in accordance with the NCAC and the *Water Shortage Response Plan Guidelines* (NCDWR, 2009) provided by the Division of Water Resources (NCDWR), and have been approved by the NCDWR, as well as each Town's respective Town Council.

In contrast to each Town's long-term water conservation program, the purpose of the WSRPs is to deal with short-term or immediate water shortages that may be caused by drought, water quality problems, or disruptions in facility operations. Both Cary and Apex have codified the authority to enact water shortage response provisions identified in the WSRPs in their respective Code of Ordinances. The implementation of the water shortage response provisions applies to the entire utility service area for both Towns, inclusive of the Haw River basin, Cape Fear River basin, and Neuse River basin.

The following sections of this Drought Management Plan provide a summary of the Towns' WSRPs and how the implementation of the WSRPs provides protection of the IBT source river basin (Haw River basin) during droughts or other emergencies.

1.2 Water Shortage Response

The IBT certificate condition requiring a Drought Management Plan focuses on the protection of the source river basin; the authority of the Towns to require water use reductions across each Town's service area as described in their WSRPs will provide for reduced water withdrawals from Jordan Lake, in the source basin, during periods of drought or other water emergencies.

The Towns have developed their WSRPs to be consistent with each other, as well as with other Triangle area water providers. The Cary and Apex WSRPs are included in Appendixes A and B, respectively.

1.3 Protection of the Source Basin

NCGS 143-215.22L(n)(2) states that a Drought Management Plan, as a condition of an IBT certificate, should specify how the IBT will be managed to protect the source basin during drought conditions with its mandatory implementation.

1. The Towns' WSRPs will reduce water withdrawals and IBT from Jordan Lake during drought conditions, thereby protecting the source basin.
2. The Towns' level of water use reduction from Jordan Lake will increase, and IBT decrease, in direct proportion to the severity and duration of drought conditions, thereby protecting the source basin.

The *Final Environmental Assessment (EA) for the Towns of Cary, Apex, and Morrisville, and for the Wake County IBT Certificate Modification* showed that the modified IBT certificate would have no significant

impact on the source basin, as indicated by potential changes in Jordan Lake levels, Jake Lake water quality, and water supply pool storage volumes and Cape Fear River flows (CH2M HILL, 2014).

Table 1 provides a comparison of the percentage of the 81-year period of record less than key hydrologic indicators for 2045 conditions, with and without the approved IBT certificate modification. The results presented in Table 1 are from hydrologic modeling analyses completed for the Final EA and include the modeled effect of the implementation of the Towns' WSRPs during drought conditions.

TABLE 1

Comparison of Percentage of Period of Record Less Than Key Hydrologic Indicators

Model Scenario	2045 Baseline (%)	2045 Requested IBT (%)
	(Without Approved IBT Certificate Modification)	(With Approved IBT Certificate Modification)
Jordan Lake Level < 210 feet msl	1.6	2.0
Jordan Lake Level < 210 feet msl, Memorial Day to Labor Day	0.2	0.3
Water Quality Pool <80% total storage volume	15.8	16.4
Water Quality Pool <60% total storage volume	5.9	6.4
Water Quality Pool <40% total storage volume	0.5	0.7
Water Quality Pool <20% total storage volume	0.0	0.0
Water Supply Pool <50% total storage volume	1.6	1.9
Flow at Lillington < 550 cfs	15.6	15.9
Flow at Fayetteville < 600 cfs	6.1	6.3

Source: CH2M HILL, 2014

< = less than

% = percent

cfs = cubic feet per second

msl = mean sea level

The implementation of the Towns' WSRPs is based on conditions in the Towns' water supply (and IBT) source basin (Haw River basin), and will result in reductions in water withdrawals from the Haw River basin by requiring water use reductions in both the source and receiving river basins (Haw, Neuse, and Cape Fear River basins). The level of water use reduction will increase in direct proportion to the severity and duration of drought conditions in the Haw River basin. As water withdrawal decreases, IBT will decrease, although not in direct proportion, since curtailing irrigation will also decrease the amount of water returned to the source basin in the form of consumptive use by customers in the Haw River basin.

The Towns' WSRPs include an estimate of the expected effectiveness of the mandatory water use reductions for each stage of water shortage response. Similarly, Table 2 provides an estimate of the range of percentage reductions that might be expected in IBT for each WSRP stage. The ranges are based on the projected water demand, consumptive use, surface water discharge, and resulting IBT for the 30-year planning period used for the IBT certificate modification (2045), as well as the expected effect of the time of

year when the WSRP is implemented. The ranges reflects the amount of uncertainty inherent in predicting the potential impact of water use reductions on the multiple factors that go into estimating IBT.

TABLE 2

Estimated Range of Interbasin Transfer Reduction for the Towns of Cary and Apex Water Shortage Response Plan Stages

WSRP Stage	Potential Decrease in IBT from WSRP Implementation (%)
1	0-5
2	5-20
3	10-25
Emergency/Rationing	20-30

1.4 Modifications to Water Shortage Response Plans

Since the WSRPs are referenced in this *Interbasin Transfer Certificate Drought Management Plan*, and the WSRPs are required to be approved by NCDWR and adopted by the Towns' governing bodies, any NCDWR-approved updates to the WSRPs will automatically be included in this plan. Additional NCDWR approval of this plan will not be required.

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SECTION 2

References

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Appendix A
Town of Cary Water Shortage Response Plan

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Town of Cary Water Shortage Response Plan

Prepared by: Leila Goodwin, P.E., Water Resources Manager and Marie Cefalo, Water Resources Outreach Supervisor

Supersedes: 1/21/2010

Adopted by Council: 8/13/2015

Effective: 8/13/2015

Purpose: To establish measures and procedures for reducing potable water use during times of water shortage.

In 1996 the Town established a comprehensive water conservation program designed to effectively manage Cary's long term water resources. The established goals for the program are to support the high quality of life in Cary by providing safe, reliable water service, while reducing per capita use of potable water, conserve a limited natural resource, and reduce the costs of infrastructure expansion. To achieve these goals the comprehensive water conservation program includes regulatory, educational, and financial incentive components. The regulatory component primarily consists of three year-round water conservation ordinances: Section 36-80, Water Service Provided by Town Includes only Alternate Day Outdoor Irrigation; Section 36-83, Waste While Watering Ordinance, 36-84 Rain Sensor Ordinance. There are also irrigation system design requirements included in the Land Development Ordinance. The fundamental educational initiatives are administered through the Town's Web pages, the annual Summer Campaign and the Block Leader Program. The primary financial incentive is the Town's tiered rate structure.

In contrast to Cary's long-term water conservation program, the purpose of this Water Shortage Response Plan (WSRP) is to deal with short-term or immediate water shortage, which may be caused by things such as drought, water quality problems, or disruptions in facility operations. The Town of Cary has been required by the state to have a WSRP since 2001 by both our Jordan Lake Allocation water supply contract and our 2001 interbasin transfer (IBT) certificate, and our 2015 IBT certificate requires Cary and Apex to have a Drought Management Plan. As of July 1, 2009, all public and privately owned water systems subject to GS 143-355 (l) are required to have an approved WSRP as part of their Local Water Supply Plans (LWSP). Rules governing water use during droughts and water emergencies (15A NCAC 02E. 0607) stipulate specific items that must be included in those plans. This WSRP was developed in accordance with the *Water Shortage Response Plan Guidelines* provided by the Division of Water Resources (January 2009) and supports the Drought Management Plan required by our 2015 IBT certificate.

I. Authorization

The Cary Town Manager, and in his or her absence the Deputy or an Assistant Town Manager, is authorized by Section 36-81 of the Town Code of Ordinances to declare a Water Shortage and to enact water shortage response provisions. References in this

document to the Town Manager apply to the Deputy or Assistant Town Managers in the Town Manager's absence.

II. Notification

Once a Water Shortage has been declared, and whenever the Water Shortage Response Stage (defined in Section IV below) changes, the following notifications will be made:

1. A notice of the effective date of the declaration and the current water use reduction state will be posted at Town Hall.
2. The Town Manager (or designee) notifies the Mayor, Town Council, neighboring municipal contract water recipients, and town government departments.
3. The Public Information Director (or designee) will contact the media. The media, including television, print, internet, and radio, will inform the public. Contact information for the Water Resources Department will be provided for additional information needed by the public.
4. The Public Information Director (or designee) will update the Town's Web site with the Water Shortage status.
5. The Water Resources Director (or designee) will contact Finance Customer Service, Public Works and Utilities Customer Service and the Water Distribution System Operator, and distribute a general e-mail so Town employees can help provide accurate information to the public.
6. Finance Customer Service will contact major water customers (both irrigation and water accounts) and inform them of the implemented measures.
7. The Water Distribution System Operator will contact the police communications center, and coordinate with bulk users.
8. The Town will directly notify both residential and non-residential customers of water restrictions via mail and/or e-mail when a water shortage is declared and when a new more restrictive stage is implemented. In addition, Town staff will email the information to irrigation contractors listed on a notification list maintained by Water Resources staff.
9. Water Resources staff will provide Public Works field employees with handouts to give customers who ask them questions as they work throughout the community.

During drought periods when declaration of a water shortage appears likely, the Town will keep customers informed of the potential for declaring a water shortage, and will provide information to customers via public service announcements and the Web site about measures they can take to reduce water use and, potentially, avoid a water shortage situation.

III. Drought Contingency Plans for Non-residential Customers

Non-residential customers are encouraged to prepare for a water shortage by determining the measures they would implement to meet the requirements of the Water Shortage Response stages described in Section IV. This can be accomplished by developing a Drought Contingency Plan during normal water supply conditions before there is a water shortage situation. Customers who use relatively large amounts of potable water and/or use potable water for public health purposes (e.g., hospitals or assisted living facilities) are especially encouraged to develop a Drought Contingency Plan well in advance of a potential water shortage situation. Resources available for assistance with developing a plan include the NC Department of Environment and Natural Resources , which published the “Water Efficiency Manual for Commercial, Industrial and Institutional Facilities” in May 2009, and Waste Reduction Partners in the Division of Environmental Assistance and Customer Service. The manual and more information are available at www.p2pays.org.

If, after developing a Drought Contingency Plan, a customer believes that meeting the default water use reduction requirements will compromise public health and safety or cause extreme hardship, the customer can submit a Drought Contingency Plan as described below to the Town’s Water Resources Outreach Supervisor (or designee) for approval. An approved Drought Contingency Plan can then be used – and must be followed – in lieu of meeting the default requirements included in Section IV for non-residential customers.

To be considered for approval a Drought Contingency Plan must include:

1. Estimated amount of potable water use per day, during both an average winter month and an average summer month, for different purposes including drinking water, basic sanitation, process water, irrigation, and other major uses specific to the customer
2. Description of any alternate water sources available
3. Description of existing high-efficiency fixtures, technologies, hardware, management practices, or other measures in use to reduce water use.
4. Measures that would be taken during each Water Shortage Response stage in order to meet the requirements in Section IV.
5. Description of the impact to the customer or to the public (e.g. reduced production, reduction of business hours, employee impacts, structural damage, etc.) of meeting the water use reduction requirements.
6. Proposed alternative measures to be taken during each Water Shortage Response stage, and the resulting expected reduction in water use for the categories listed in item 1, under both average winter and average summer conditions.

Non-residential customers with an approved Drought Contingency Plan must resubmit their plan for approval every five years, or sooner if there is a significant change in water use or other conditions which would alter the plan’s effectiveness.

IV. Water Shortage Response Stages

Four water shortage response stages, intended to achieve system-wide water use reduction, are described below and summarized in Table 1. Before Stage 1 is implemented, the Town will communicate to each customer a summary of the customer's historical water use, their normal indoor winter water use, and information on how much water can be saved with different water use reduction measures.

Non-residential customers who have an approved Drought Contingency Plan must reduce water use during each stage as specified in their plans.

Stage 1

Spray irrigation using potable water is limited to one (1) day per week for all purposes except the maintenance of athletic fields. No new turf watering exemption permits will be issued and any existing permits for watering periods that begin later than 14 days after the effective date of Stage 1 will be rescinded. Hand watering, drip irrigation, and subsurface irrigation are still allowed. Other outdoor water uses such as pressure washing, car washing, and keeping swimming pools filled are allowed, although customers are strongly encouraged to minimize such uses.

Stage 2

Spray irrigation using potable water is not allowed for any purpose except the maintenance of athletic fields. No new turf watering exemption permits will be issued, and any previously issued exemption permits for watering periods that have not expired will be rescinded. Hand watering, drip irrigation, and subsurface irrigation are still allowed. Other outdoor water uses such as pressure washing, car washing, and keeping swimming pools filled are allowed, although customers are strongly encouraged to minimize such uses.

Stage 3

No outdoor water use with potable water is allowed, including but not limited to: spray irrigation, hand watering, drip irrigation, and subsurface irrigation, ornamental fountains, car washing, pressure washing, and keeping swimming pools filled. No new turf watering exemption permits will be issued and any previously issued permits for watering periods that have not expired will be rescinded. Firefighting and utility system maintenance are the only allowable outdoor water uses.

All customers are required to limit their monthly water use to average winter monthly use. This amount will be provided to each customer by the Water Resources Department, based on the water use history for his or her account, well in advance of Stage 3 implementation. If historical monthly use was radically different than expected normal winter indoor use (e.g., a customer was away for an extended period) staff may modify the monthly limit. The approach will be the same for residential and non-residential customers.

Rationing

In this stage, the goal is to ensure there is drinking water available to protect public health (e.g., health care, drinking water, basic sanitation). Customers are encouraged

to use the minimum amount of water needed for public health protection. No outdoor water use with potable water is allowed, including but not limited to: spray irrigation, hand watering, drip irrigation, and subsurface irrigation, ornamental fountains, car washing, pressure washing, and keeping swimming pools filled. As in Stage 3, no new turf watering exemption permits will be issued and any previously issued permits for watering periods that have not expired will be rescinded. Firefighting and utility system maintenance are the only allowable outdoor water uses.

All customers are required to reduce their normal winter water use, as defined above in Stage 3, by 15%.

Table 1: Water Shortage Response Stage Summary

	Year-round Water Conservation Program	Water Shortage Response Stages			
		Stage 1	Stage 2	Stage 3	Rationing
Outdoor Spray Irrigation	Three days per week	One day per week	None	None	None
Hand watering, drip irrigation, subsurface irrigation, athletic field maintenance	Allowed	Allowed	Allowed	None	None
Other outdoor water use such as pressure washing, car washing, filling/topping off swimming pools	Allowed	Allowed	Allowed	None	None
New Turf Watering Exception Permits	Allowed	No new permits issued, permits beginning more than 14 days after stage 1 date rescinded	None	None	None
Indoor Water Use Restrictions ¹	None	None	None	Limited to normal indoor winter use	Reduce normal winter use by 15%
¹ Non-residential customers with an approved Drought Contingency Plan will follow the steps in their Plans.					

V. Water Shortage Response Triggers for Chronic Conditions

Triggers are conditions which, when reached, cause a water shortage response stage to be implemented. Triggers are based on the ability to meet water demands and are influenced by several components of the Town’s water supply system: the water source (Jordan Lake and/or purchase from others), raw water intake and pipeline, treatment plant, storage tanks, and distribution system. Town staff and the Town Manager

continually evaluate the status of all these components to determine if a water shortage condition exists or is approaching.

The triggers that would initiate a water shortage declaration from the Town Manager, and cause changes in the Water Shortage Response Stages as conditions worsen or improve, are based on the number of days of water supply available to meet potable water demands. The days of water supply remaining is calculated by dividing the working supply volume by the moving 30-day average daily demand. The working supply volume is defined as the amount currently stored, and accessible without permitting or capital improvements, in the combined Cary/Apex, Morrisville, and Wake County (for RTP South) Jordan Lake water supply storage allocations. The moving 30-day average daily demand is the total demand from customers in the Towns of Apex, Cary and Morrisville, and RTP South.

$$\text{Days of Supply Remaining} = \frac{\text{Working Supply Volume}}{\text{Moving 30-Day Average of Daily Demand}}$$

Table 2 describes the triggers for entering the increasing stages of Water Shortage Response as conditions worsen and the Days of Supply Remaining declines. The Water Resources Director (or designee) will advise the Town Manager, in writing, when a trigger has been reached for a water shortage response stage. The Manager (or designee) shall then implement the appropriate water shortage response stage by issuing a declaration to take effect within 10 days of the date when the trigger was reached. The Town Manager may, based on other factors (described below), declare a Water Shortage or implement stages before a trigger is reached (sooner than Table 2 would indicate) if Days of Supply are declining or other conditions are worsening.

Table 2: Water Shortage Response Triggers for Declining Days of Supply Remaining

Stage	Triggers When Days of Supply Remaining is Declining
(Water Shortage declared) Stage 1	Days of Supply Remaining is 120 days or less
Stage 1 to Stage 2	Stage 1 has been in place for 28 continuous days AND Days of Supply Remaining is 90 days or less
Stage 2 to Stage 3	Days of Supply Remaining is 60 days or less
Stage 3 to Rationing	Days of Supply Remaining is 30 days or less

Table 3 describes the triggers for moving out of Water Shortage Response stages as conditions improve and the Days of Supply Remaining increases. The Water Resources Director shall advise the Manager, in writing, when a trigger has been reached for decreasing a water shortage response stage or ending a water shortage declaration. Based on the written notification that a trigger has been reached, the Manager, in his discretion, may issue a declaration decreasing the water shortage response stage or ending a water shortage declaration. Based on other factors

(described below), the Manager may elect to move out of a stage after a trigger is reached (slower than Table 3 would indicate).

Table 3: Water Shortage Response Triggers for Increasing Days of Supply Remaining

Stage	Triggers When Days of Supply Remaining is Increasing
Rationing to Stage 3	Days of Supply Remaining has been at least 60 days for at least 14 continuous days
Stage 3 to Stage 2	Days of Supply Remaining has been at least 90 days for at least 14 continuous days
Stage 2 to Stage 1	Days of Supply Remaining has been at least 120 days for at least 14 continuous days
Water Shortage ended	Jordan Lake Water Supply allocation has been 100% full for at least 14 continuous days

Other factors considered may include but not be limited to:

- Jordan Lake elevation.
- US Army Corps of Engineers' operation of Jordan Lake in drought contingency mode.
- Indications of short or long-term water quality concerns regarding Jordan Lake or other sources.
- Level of interbasin transfers relative to the Cary/Apex interbasin transfer certificate amount.
- Drought Advisory issued by the NC Drought Management Advisory Council.
- Sudden loss of supplemental water supplies during periods of high demand.

VI. Water Shortage Triggers and Response for Acute Conditions

Events such as contamination, equipment or facility failure, or line breaks require a swift and immediate response. Examples of conditions that may result in an immediate water shortage include:

- The occurrence of a major water transmission main break, fire, or any other emergency that would require high volumes of water, such that demand could exceed supply.
- Accidental or intentional contamination of the water system.
- Mechanical failure in the water treatment plant or distribution system.
- Inability to distribute water through part of the system.

The following Standard Operating Procedures identify protocols Town staff follows when these circumstances arise:

OPS #007, De-chlorination Procedure for Water Distribution System Flushing and Main Break or Reclaimed Water System Main Break

OPS #008, Water Main and Service Line Breaks

OPS #010, Water Transmission Main Shut Down

OPS #015, Water Main Break by Contractor

OPS #017, Fecal Coliform-E.coli/Contamination Response

In addition, an Emergency Response Plan, kept confidential for security purposes, identifies detailed procedures to follow should an emergency of that magnitude happen. Upon recommendation of the Water Resources Director, the Town Manager may declare a water shortage and implement any water shortage response stages or other measures as he or she deems appropriate for any such immediate water shortage situation.

VII. Enforcement

Compliance with the requirements of the Water Shortage Response Plan is required by the Water Shortage Ordinance (Section 36-81). Penalties are specified annually in the Budget Ordinance (Operating Budget Fee Schedule, Water Resources).

The Town has Water Conservation Technicians who regularly enforce our year-round water conservation ordinances, which address outdoor water use and water waste. During a water shortage, these staff members will continue their enforcement of outdoor water use restrictions, and other staff members may also be used as needed to achieve the desired system-wide water use reductions. During a water shortage, in contrast to during normal times, there will be no warnings before fines are issued for non-compliance with outdoor water use restrictions, and the fines are higher than during normal times. However, the fine for a first-time violation will be deferred and either 1) waived at the end of the water shortage if there is not a second violation or 2) added to the fine for a second violation if that occurs.

Reductions in indoor water use are not required in Stages 1 and 2, but the amount of reductions that may be occurring voluntarily will be evaluated using water usage data. Compliance with the required indoor water use reductions in Stage 3 and Rationing will be monitored, and Town staff will audit water use as conditions warrant and/or if expected overall system water use is not decreasing as needed.

VIII. Variance Protocols

The Town recognizes that the requirements for water use reduction in Table 1 may have significantly more impact on some customers than on others and in some cases could affect public health and safety. To be considered for a variance, customers may submit a letter requesting the variance to the Water Resources Director. The letter must include an explanation of why the requirements in Table 1 are not appropriate, cause extreme hardship, or affect health and safety. The letter should include proposed water use reductions for each stage and an explanation of why they are more appropriate.

A decision to approve or deny variance requests will be based upon consideration of criteria including, but not limited to: impact on water demand, expected duration of water shortage, alternative source options, social and economic importance of water use,

purpose of water use (i.e., necessary use of drinking water) and the prevention of structural damage.

IX. Expected Effectiveness

The effectiveness of the Town of Cary Water Shortage Response Plan will be determined by measuring system-wide water use reduction. Variables other than water use restrictions that may impact reduction goals will be considered. Some of these include frequency of plan activation, any problem periods without activation, total number of violation citations, desired reductions attained and evaluation of demand reductions compared to historical data. Table 4 indicates the potential expected reduction from usage levels that were documented using 2007 customer billing records. If demands differ from 2007 usage levels, the percentages would differ.

Table 4: Expected Water Use Reductions

Water Shortage Response Stage	Expected Approximate Reductions Relative to Normal Water Use	
	May through October	November through April
Stage 1	13%	6%
Stage 2	32%	10%
Stage 3	38%	17%
Rationing	46%	29%

X. Revision

The WSRP will be reviewed if there are new circumstances affecting water supply and demand, and following any Water Shortage declaration. The WSRP will be updated if indicated after a review, or at a minimum every five years as required by the provisions of GS 143-355 (l) and when our Local Water Supply Plan is updated. The Town of Cary Water Resources Director (or designee) is responsible for initiating all WSRP updates.

XI. Public Comment

This WSRP was prepared based on public input received via an on-line survey (available for one month; 91 participants), emailed comments, and at an Open House held April 29, 2009. Subsequent revisions of the Water Shortage Response Plan will go through the normal processes for approval at regular meetings of the Town Council. The proposed WSRP revisions will be publicized as part of the meeting agendas.

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Appendix B
Town of Apex Water Shortage Response Plan

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Town of Apex Water Shortage Response Plan

June 2009

Prepared by:
Jessica Bolin, PE
John Cratch



and



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Attachments

- Attachment 1 Town of Apex 2007 Water Usage
- Attachment 2 Town of Apex 2008 Water Usage

Appendix

- A Water Conservation Ordinance, Effective February 2, 1999,
Amended February 2010

SECTION 1

Introduction

The purpose of this Water Shortage Response Plan (WSRP) is to provide a framework for making water supply and conservation decisions during times when water supplies in the region may be low either due to drought conditions, water quality problems, or disruptions in facility operations. This Plan supplements the Town of Apex's *Water Conservation Ordinance* (Appendix A), which became effective February 2, 1999 and was amended in February 2010.

The Town of Apex has been required by the State to have a WSRP since 2001 by both our Jordan Lake Allocation water supply contract and our interbasin transfer certificate. More recently, as of July 1, 2009 all public and privately owned water systems subject to GS 143-355 (I) are required to have an approved WSRP as part of their Local Water Supply Plan (LWSP). Rules governing water use during droughts and water emergencies (15A NCAC 02E.0607) require specific items that must be included in those plans. This WSRP was developed in accordance with the *Water Shortage Response Plan Guidelines* provided by the Division of Water Resources (DWR) (January 2009).

SECTION 2

Water Supply Assessment

The Town of Apex and the Town of Cary have a joint allocation of the water supply storage volume in the Jordan Lake water supply pool. Only 61 percent of the Jordan Lake estimated 100 million gallons per day (MGD) safe yield has been allocated. The rest of the water supply pool is currently unallocated. Of the allocated 61 MGD, 32 MGD of the water supply pool (on an average annual basis), is allocated to the Towns of Apex and Cary. The Town of Apex portion of this allocation is 8.5 MGD.

Two graphs shown as Attachments 1 and 2 at the end of this document illustrate historical water usage for the Town of Apex by month for the calendar years 2007 and 2008.

The Towns of Apex and Cary currently share a raw water intake at Jordan Lake. The water is treated at the Cary/Apex Water Treatment Plant (WTP). The Town of Apex also has letter agreements with the Town of Holly Springs and Harnett County from which it could receive emergency water supplies of approximately 1 MGD of finished water.

Interconnections exist with the water distribution systems of Raleigh, Holly Springs, Harnett County, and Cary, which is also connected to Durham. These interconnections provide the Town with access to several back-up supplies in the event of a failure that may require the repair of pipelines. Although formal emergency agreements are not in place with all of these communities, the interconnections do provide the Town with the flexibility to respond to drought periods and other water supply emergencies.

SECTION 3

Water Shortage Response Plan

The purpose of this Water Shortage Response Plan (WSRP) is to deal with short-term water shortage, which may be caused by drought, water quality problems, or disruptions in facility operations. The North Carolina Division of Water Resources (DWR) *Water Shortage Response Handbook for North Carolina Water Supply Systems* (2003) requires that municipalities develop a Water Shortage Response Plan/Program that includes the following components:

1. Adopt an ordinance to provide authority to enact system measures to reduce demand in the case of an emergency;
2. Develop a method to evaluate ability to meet demand;
3. Develop procedures for implementing appropriate water use restriction stages;
4. Identify person(s) responsible for implementing the water shortage response protocols;
5. Develop a method to notify system employees and the customers of the shortage;
6. Develop a method to measure the supply and demand and identify the conditions that trigger more or less restrictive measures;
7. Identify the levels of required response and actions to be taken;
8. Identify the enforcement and variances of the water shortage plan;
9. Develop a method for the Town to review and comment on the water shortage response protocols, revision of the protocols, and the evaluation of the effectiveness of the protocols.

Each of these components has been implemented by the Town of Apex and is described in the following sections.

3.1 Authority of Plan

DWR recommends that every municipality adopt an ordinance to “provide for the declaration of a water shortage and specify voluntary and mandatory conservation measures to be imposed at each level of water shortage severity.”

The Town Manager has the authority to implement measures outlined in the water conservation ordinance to address potential water shortages, including Section 12-101, *Continuing Water Conservation Measures* which includes the odd/even outdoor irrigation schedule; and Section 12-102, *Stages of Conservation Measures in Response to Water Shortage*. In the Town Manager’s absence, the Assistant Town Manager has vested authority to implement such measures. The Town Manager and/or the Assistant Town Manager will initiate water shortage response Stages 1, 2, 3, and Emergency/Rationing according to various factors affecting water supply and demand. Bruce Radford, Town Manager, can be contacted at 249-3301 and Mike Wilson, Assistant Town Manager, can be contacted at 249-3302.

3.2 Plan Activation and Notification Protocol

Once the potential for a water shortage has been declared, the following plan implementation and communication steps are taken. Mandatory measures will remain in effect until declared otherwise by the Town Manager, and updates to the plan over the duration of the water shortage will be provided in the sequence outlined below.

1. The Town Manager (or designee) notifies the Mayor, Town Council, neighboring municipal contract water recipients (if any), and Town employees.
2. The Public Information Officer (PIO) will contact the media (if the PIO is unavailable, media contacts will be made by the Town Manager's designee). The media, including television, newspaper, and radio, will inform the public. The phone number of the Public Works & Utilities Department (919-249-3427) will be provided for additional information if needed by the public. Informational mailings will be distributed to residents via monthly utility bills. In addition, the Town's website, www.apexnc.org, will be updated with the latest information.
3. Public Works & Utilities staff will coordinate with Finance Department Customer Service so Town employees can help provide accurate information to the public and to get a list of major water customers.
4. Staff will call major water customers (both irrigation and water accounts) and inform them of the implemented measures.
5. Staff will contact the Fire Department and coordinate with bulk users.
6. Staff will supply fliers for distribution by field employees to place on customers' doors or provide to customers that need more information.

3.3 Water Shortage Stages

Apex's water shortage response consists of four stages as summarized in Table 3-1. The stages have been designed and are defined to represent an increasing level of severity of water shortage, subsequently triggering an increasing level of response to reduce the Town of Apex water demands. The Stages are triggered when the water supply and/or the demand changes. The Town's ability to meet demand is dependent on several components of the water supply system: the water source (Jordan Lake and/or purchase from others), raw water intake and pipeline, treatment plant, storage tanks, and distribution system. The Town continually monitors its water demand and supply, especially during times of drought conditions.

Stage 1

Spray irrigation using potable water is limited to one (1) day per week for all purposes except the maintenance of athletic fields. No new turf watering exemption permits will be issued and any existing permits for watering periods that begin later than 14 days after the effective date of Stage 1 will be rescinded. Hand watering, drip irrigation, and subsurface irrigation are still allowed. Other outdoor water uses such as pressure washing, car washing, and keeping swimming pools filled are allowed, although customers are strongly encouraged to minimize such uses.

Stage 2

Spray irrigation using potable water is not allowed for any purpose except the maintenance of athletic fields. No new turf watering exemption permits will be issued, and any previously issued exemption permits for watering periods that have not expired will be rescinded. Hand watering, drip irrigation, and subsurface irrigation are still allowed. Other outdoor water uses such as pressure washing, car washing, and keeping swimming pools filled are allowed, although customers are strongly encouraged to minimize such uses.

Stage 3

No outdoor water use with potable water is allowed, including but not limited to: spray irrigation, hand watering, drip irrigation, and subsurface irrigation, ornamental fountains, car washing, pressure washing, and keeping swimming pools filled. No new turf watering exemption permits will be issued and any previously issued permits for watering periods that have not expired will be rescinded. Firefighting and utility system maintenance are the only allowable outdoor water uses.

Emergency/Rationing

In this stage, the goal is to ensure there is drinking water available to protect public health (e.g., health care, drinking water, basic sanitation). Customers are encouraged to use the minimum amount of water needed for public health protection. No outdoor water use with potable water is allowed, including but not limited to: spray irrigation, hand watering, drip irrigation, and subsurface irrigation, ornamental fountains, car washing, pressure washing, and keeping swimming pools filled. As in Stage 3, no new turf watering exemption permits will be issued and any previously issued permits for watering periods that have not expired will be rescinded. Firefighting and utility system maintenance are the only allowable outdoor water uses.

Table 3-1: Water Shortage Response Stage Summary

	Year-round Water Conservation Program	Water Shortage Response Stages			
		Stage 1	Stage 2	Stage 3	Emergency/Rationing
Outdoor Spray Irrigation	Three days per week	One day per week	None	None	None
Hand watering, drip irrigation, subsurface irrigation, athletic field maintenance	Allowed	Allowed	Allowed	None	None
Other outdoor water use such as pressure washing, car washing, filling swimming pools	Allowed	Allowed	Allowed	None	None
New Turf Watering Exception Permits	Allowed	No new permits issued, permits beginning more than 14 days after Stage 1 date rescinded	None	None	None

3.4 Water Shortage Triggers

The goal of having staged trigger points is to provide the Town the ability to reduce their demands during times of water shortages and thereby extend the timeframe between reaching successive trigger points. Triggers are based on the ability to meet water demands and are influenced by several components of the Town’s water supply system: the water source, raw water intake and pipeline, treatment plant, storage tanks, and the distribution system. Town staff continually evaluates the status of these components to determine if a water shortage condition exists or is approaching. The primary trigger is the water supply storage in Jordan.

3.4.1 Jordan Lake Water Supply Storage Allocation

Apex and Cary have a joint allocation of the water supply storage volume in the Jordan Lake water supply pool. Apex Public Works & Utilities staff communicates regularly with the Cary Public Works & Utilities staff regarding available water supply, especially during drought conditions.

The Town of Cary is responsible for tracking the amount of water in storage for the Apex/Cary allocation on a daily basis using daily and monthly water demand estimates,

and daily lake inflows obtained from the U.S. Army Corps of Engineers (USACE). Cary staff uses these storage estimates to predict a worst case scenario of the number of days of water supply that remains. This worst case scenario does not take into account any inflow to Jordan Lake; in other words, it is assumed that there is zero inflow to the lake. The number of days of remaining water supply is calculated by dividing the storage volume in the jointly allocated water supply pool by the average water demand for the previous 30 days. From these values, Apex staff determines the number of days of storage available to the Town based on the Town’s percentage of the allocation and the recent demand profile.

DWR has recommended guidelines for monitoring the available water supply and when necessary, implementing a minimum of three stages of water shortage response: voluntary, mandatory, and emergency. As described previously, the Town of Apex has four water shortage stages: Stage 1, Stage 2, Stage 3, and Emergency/Rationing. Table 3-2 shows Apex’s four water shortage stages and the associated number of days of remaining storage which act as the triggers to implement each stage. Table 3-3 shows the water supply response triggers for increasing days of supply remaining; this table would be used when coming out of a drought situation.

Table 3-2: Water Shortage Response Triggers for Declining Days of Supply Remaining

Stage	Triggers When Days of Supply Remaining is Declining
(Water Shortage declared) Stage 1	Days of Supply Remaining 120 days or less
Stage 1 to Stage 2	Stage 1 has been in place for 28 continuous days AND Days of Supply Remaining 90 days or less
Stage 2 to Stage 3	Days of Supply Remaining 60 days or less
Stage 3 to Emergency/ Rationing	Days of Supply Remaining 30 days or less

Table 3-3: Water Shortage Response Triggers for Increasing Days of Supply Remaining

Stage	Triggers When Days of Supply Remaining is Increasing
Emergency/ Rationing to Stage 3	Days of Supply Remaining has been at least 60 days for at least 14 continuous days
Stage 3 to Stage 2	Days of Supply Remaining has been at least 90 days for at least 14 continuous days
Stage 2 to Stage 1	Days of Supply Remaining has been at least 120 days for at least 14 continuous days
Water Shortage ended	Jordan Lake Water Supply allocation is 100% full for at least 14 continuous days

The triggers shown in Tables 3-2 and 3-3 serve as guidelines and are used by the Town of Apex in combination with an assessment of the other factors that influence water supply and demand as described in this section to determine the timing of implementation of the appropriate water shortage stages during periods of water shortage.

3.4.2 Other Factors

The Town recognizes that there are several other factors to be considered when evaluating the potential for water shortage conditions. These factors include:

1. Jordan Lake Elevation. The lake elevation is influenced most by the amount of inflow to the lake from upstream and the amount of water released from the dam to the Cape Fear River downstream. Apex Public Works & Utilities staff communicates regularly with the Cary Public Works & Utilities staff regarding lake elevation, especially during drought conditions. The Town of Cary is responsible for monitoring the lake levels and how the elevation compares to the elevations of the raw water intakes in Jordan Lake. The elevation of the top pipe of the primary raw water intake is at 208.3 feet mean sea level, while the elevation of the top pipe of the lower intake is 204.25 feet mean sea level. Extension devices have been fabricated to allow adjustments to the elevation of either intake.
2. A sudden loss of supplemental water supplies during periods of high demand;
3. The occurrence of a major water transmission main break, fire, or any other emergency that would require high volumes of water, such that demand could exceed supply;
4. An indication of short or long-term water quality concerns regarding Jordan Lake or other sources;
5. An accidental or intentional contamination of the water system;
6. The level of interbasin transfers relative to Apex and Cary's interbasin transfer (IBT) certificate amount;
7. A drought advisory issued by the NC Drought Management Advisory Council;
8. A mechanical failure at the WTP or within the distribution system.

3.5 Enforcement

If there is a violation of any provision of the water conservation ordinance including the mandatory water conservation measures, the violator is subject to a penalty of up to \$1,000.00 per violation per day. A warning is issued for a first offense. Subsequent violations will be subject to the penalty fee. The Town may also choose to discontinue water service if necessary due to continuing violations. Citizens are encouraged to report violators to the Town Public Works & Utilities Department.

3.6 Variances

The Town recognizes that the requirements for water use reduction in Table 3-1 may have significantly more impact on some customers than on others and in some cases could affect public health and safety. To be considered for a variance, customers may submit a letter requesting the variance to the Public Works & Utilities Director at PO Box 250, Apex, NC

27502. The letter must include an explanation of why the requirements in Table 3-1 are not appropriate, cause extreme hardship, or affect health and safety. If a variance from either the Stage 3 or Emergency/Rationing requirements is requested, the letter should include proposed water use reductions and an explanation of why they are more appropriate.

A decision by the Public Works & Utilities director or designee to approve or deny variance requests can be expected within two weeks and will be based upon consideration of criteria including but not limited to: impact on water demand, expected duration of water shortage, alternative source options, social and economic importance, purpose of water use (i.e., necessary use of drinking water) and the prevention of structural damage.

3.7 Plan Evaluation

The Town of Apex is committed to providing a safe and reliable water supply to its citizens. The Town understands that an effective WSRP is necessary to reduce system demands during a water shortage situation. After a plan implementation, the Town will evaluate the effectiveness of the trigger thresholds to prolong the Town's water supply and the efficiency of conservation to reduce water demands. The effectiveness of the protocols will be measured by the frequency of their activation, the number of violation citations, and if desired reductions were attained. Table 3-4 indicates the potential expected reduction from normal use for each stages, depending on the time of year.

Table 3-4: Expected Water Use Reductions*

Water Shortage Response Stage	Expected Approximate Reductions Relative to Normal Water Use	
	May through October	November through April
Stage 1	13%	6%
Stage 2	32%	10%
Stage 3	38%	17%
Emergency/Rationing	46%	29%

**Town of Cary staff developed these numbers based on 2007 customer billing records.*

3.8 Plan Revisions

Water Shortage Response Plans should be updated regularly in response to changing conditions within the community. Circumstances warranting an updated plan may include new development, water supply demands, or changes in the number or types of available water supplies. A work group of Town staff will review procedures after each emergency reduction stage and will recommend necessary improvements to the Town Manager.

This plan will also be subject for review following any water shortage declaration. If indicated by these reviews or at a minimum of every five years as required by the provisions of GS 143-355 (1) the WSRP will be updated and submitted to DWR for review. An opportunity for public comment will be provided for any update of the WSRP before presentation to the Town Council for approval. The Town of Apex Public Works & Utilities Director (or designee) is responsible for initiating all WSRP updates.

3.9 Conservation Measures

The Town of Apex has multiple conservation measures that apply year-round even when there is no water shortage. The measures are in place in an effort to responsibly manage the valuable resource and to extend the Town's water supply during times of approaching drought conditions. The measures are listed below and explained in detail in Apex's *Water Conservation Ordinance* (Appendix A):

1. Mandatory year-round odd/even outdoor watering,
2. Prohibited operating conduct for irrigations systems;
3. Requiring rain sensors;
4. Operation of the rain sensors;
5. Irrigation surcharge;
6. Avoiding improper connections;
7. Improper connections;
8. Prohibiting unauthorized use.

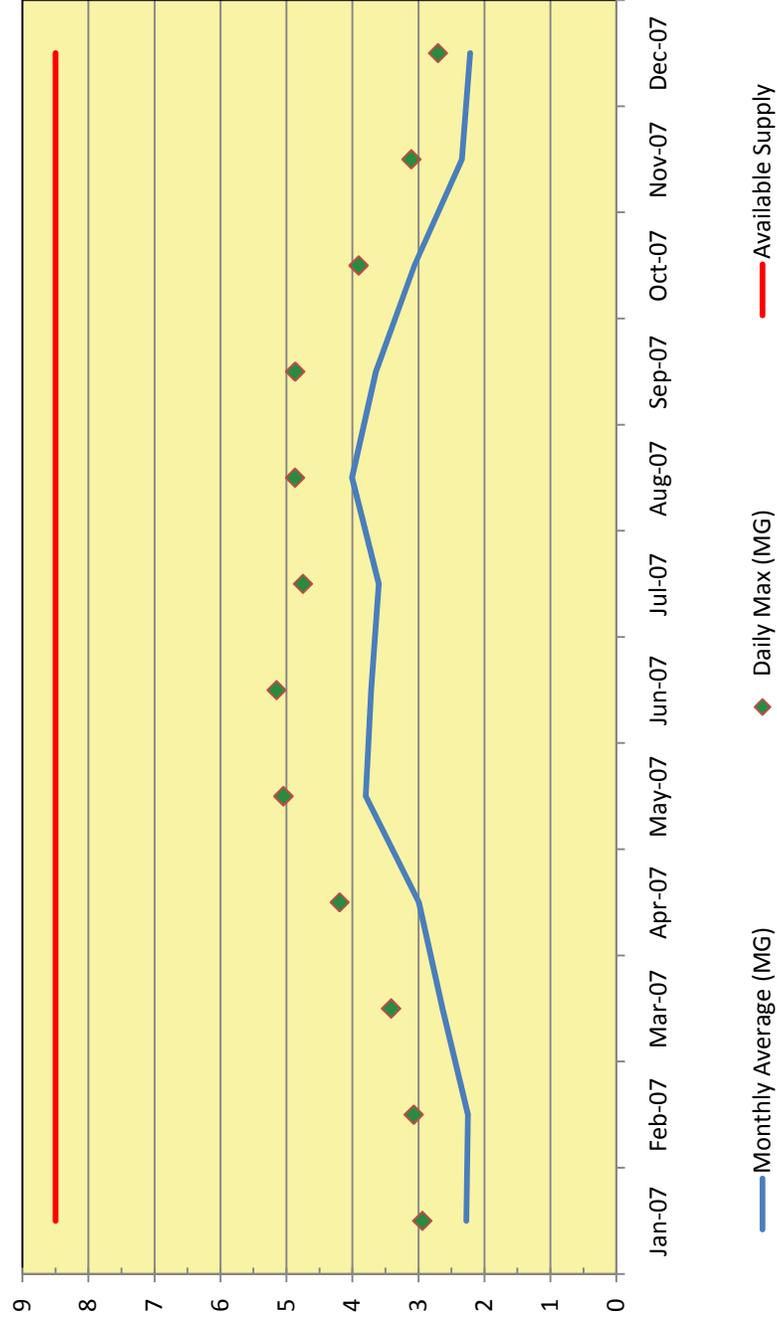
In addition to the year-round measures outlined in the water conservation ordinance, the Town also has water conservation education and incentive based measures that assist the Town's goal of responsible resource management. These education and incentive based year-round conservation components are as follows:

1. Water Conservation webpage – The Town's website contains information on household water conservation tips, an educational outline on the year-round irrigation restrictions, and frequently asked questions related to the water conservation ordinance.
2. Water Conservation pamphlet – The pamphlet is provided to all citizens on an as needed basis and details water conservation information including the schedule for the odd/even irrigation schedule requirements, ways to save water, current water restrictions, as well as contact information to call for questions on water conservation or on concerns in reference to significant water losses at a residence or from public water infrastructure.
3. Rain barrels – The Town provides citizens the ability to purchase rain barrels at cost at the Public Work & Utilities Department. The ability to conveniently purchase rain barrels provides citizens with an incentive for water conservation by using the rain barrels for landscape watering and is an educational opportunity for the community.

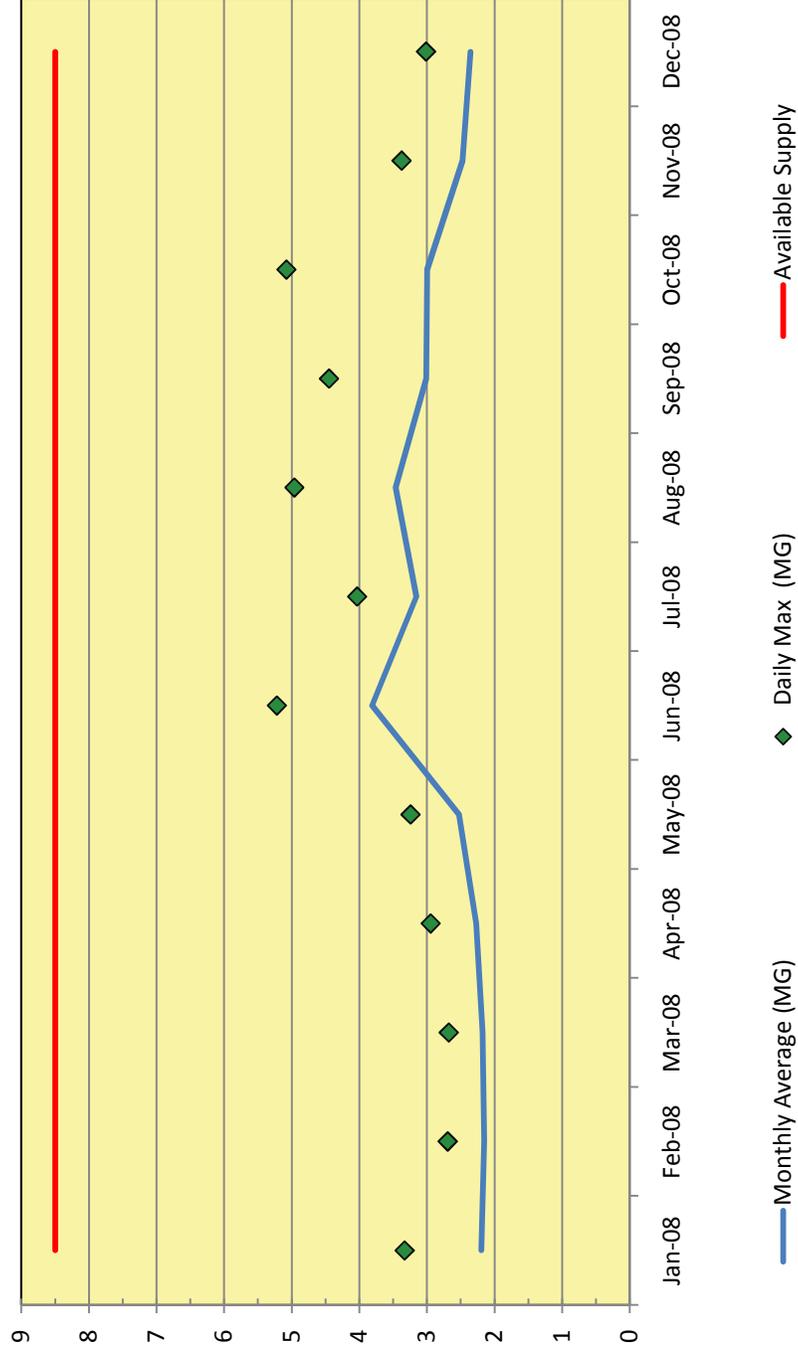
3.10 Public Comment

The public will be given several opportunities for plan review and comment. A draft plan will be posted on the Town's website at www.apexnc.org at least 30 days prior to the adoption vote by Town Council. A public meeting will be held at Apex Town Hall prior to this adoption vote in order to document verbal comments on the plan. Notices for these opportunities will be sent out in customer utility bill mailings.

Town of Apex 2007 Water Usage



Town of Apex 2008 Water Usage



APPENDIX A

**Water Conservation Ordinance, Effective February
2, 1999, Amended (Draft) April 2009**

TOWN OF APEX CODE OF ORDINANCES
Chapter 12 MUNICIPAL UTILITIES AND SERVICES*
ARTICLE III. WATER AND SEWERS
DIVISION 5. WATER CONSERVATION*

***Editor's note:** An Ordinance adopted Feb. 2, 1999, deleted §§ 12-100--12-104 in their entirety and replaced them with similar provisions to read as herein set out. Former §§ 12-100--12-104 derived from the 1973 Code and an Ord. of July 24, 1986.

Sec. 12-100. Definitions.

Customer means any person in whose name the Town maintains an account for water use, or who is responsible for payment of water passing through a particular meter. All customers are responsible for any use of water that passes through the meter for which they have an account or are otherwise responsible and are deemed to be users hereunder.

Hand watering means any form of irrigation that is connected to the Town's public water supply system and held in hand during irrigation use.

Impervious surface means any surface which cannot be penetrated by water or which causes water to run off the surface, including streets, driveways, and sidewalks.

Irrigation means the act of applying water to the outdoor landscape through means such as moveable sprinklers, installed watering systems, hoses, or other devices.

Irrigation system means a device or combination of devices that transmit or apply Town water or any mixture containing Town water to residential or commercial lawns, landscapes or green space.

Person means any individual, corporation, company, association, partnership, or other entity.

Public Works and Utilities Director means the Town department head in charge of the Public Works & Utilities department.

Rain sensor means a device that measures rainfall and overrides the irrigation cycle of an irrigation system, thus turning it off, when a predetermined amount of rain has fallen. To meet the requirements of this division, a rain sensor shall be adjusted to shut off irrigation systems when one-fourth inch (1/4") of rain has fallen.

Town Manager means the Town Manager or his designee.

Town water means all water available to the Town for treatment and any treated water introduced by the Town into its potable water distribution system. Not included in this definition is any treated wastewater effluent reclaimed for reuse in irrigation or other approved uses.

Trigger means conditions defined in the Water Shortage Response Plan (WSRP) which will cause a water shortage to be declared or ended, or cause water shortage response stages to be increased or decreased in severity.

Water shortage exists when the Town cannot satisfy the ordinary demands and requirements of water consumers served by the Town without depleting the water supply to a level that jeopardizes the continued availability of water for human consumption, sanitation, and fire protection.

Water system means the system of pipes, valves, meters, tanks, pumps, and treatment facilities owned and operated by the Town of Apex for the purpose of collecting, treating, and distributing Town water.

(Ord. of 2-2-99, § 1; Ord. No. 07-0807-09, § 1, 8-7-07)

Cross references: Definitions and rules of construction generally, § 1-3.

Sec. 12-101. Continuing water conservation measures.

The water conservation measures enumerated in this section shall apply to all Town water customers, Town water users, and other persons at all times whether or not a water shortage exists.

(1) Mandatory year-round odd/even watering schedule. Properties with odd-numbered addresses may water lawns and/or landscapes only on Tuesday, Thursday, and Saturday. Properties with even numbered addresses may water lawns and/or landscapes only on Wednesday, Friday, and Sunday. No lawns and/or landscapes shall be watered on Monday. Watering with a hand-held hose is permitted every day.

Exemption: Property owners may obtain a 45 day New Landscape Permit from the Public Works Department for the purpose of establishing new plantings. New plantings for the purpose of this permit are defined as large commercial plantings or the installation of new sod or seed to a bare area of more than 50% of the grassed or proposed grassed area of a residential yard. Such a permit may not be granted for over-seeding of established grass. The permit will become effective at the requested start date and expire 45 days later.

(2) Prohibited conduct in operating irrigation systems. No person shall operate or maintain an irrigation system in a manner that:

a. Allows water from emitting devices to fall on impervious surfaces to the extent that water runs off the property being irrigated onto public streets or property; or

b. Allows water from emitting devices to fall on any surface such that water accumulates to the extent that it runs off the property being irrigated onto public streets or property.

(3) Rain sensors required. Rain sensors are required on all automatic irrigation systems. The sensors shall be installed in appropriate locations in order to prevent irrigation during periods of rainfall.

(4) Operation of rain sensors. Rain sensors shall be adjusted and set so that for each rainfall event, the sensors shut off the irrigation system after one-fourth inch (1/4") of rainfall has occurred. Rain sensors shall be installed according to the manufacturer's instructions and in a location that provides full exposure to rainfall. Rain sensors shall be maintained in proper working condition.

(5) Irrigation surcharge. The charges for water used for irrigation shall be computed by multiplying the customer's otherwise applicable water rate by a multiplier established by the Town Council and revised from time to time.

(6) Damage to system. No person shall damage, cut, break, obstruct, alter, interfere with, or tamper with any water pipe, water main, hydrant sewer pipe, water tank, water meter, water meter box, or any other part of the water system without the express written permission of the Town.

(7) Improper connections. No person shall make a connection to any portion of the water system in a manner that violates the North Carolina State Building Code or the Rules Governing Public Water Systems promulgated by the State of North Carolina or any agency thereof.

(8) Unauthorized use. No person shall consume, use, or otherwise take water from the water system without first obtaining permission from the Town and making arrangements to pay the applicable fees for the water.

(Ord. of 2-2-99, § 1; Ord. No. 07-0807-09, § 2, 8-7-07)

Sec. 12-102. Stages of conservation measures in response to water shortage.

The mandatory odd/ even watering schedule shall be enforced year-round. To avoid or lessen the impact of a water shortage, the Town Manager will institute Stages 1, 2, 3 and Emergency/Rationing by written declaration, which shall be effective upon being signed and posted on the Town bulletin board and a copy placed with the Town clerk.

The Town Manager shall base his action upon a review of all factors that affect the Town's water supply including, but not limited to, current water supply, stream flow, lake level, seasonal effect on water supply, and current consumption rates. The water shortage response triggers for declining days of supply as well as increasing days of supply will be followed as outlined in the Town's Water Shortage Response Plan (WSRP). The following table illustrates the irrigation restrictions associated with each stage of mandatory water conservation.

	STAGE 1	STAGE 2	STAGE 3	EMERGENCY/ RATIONING
SPRAY IRRIGATION	1 DAY/WEEK	NOT ALLOWED	NOT ALLOWED	NOT ALLOWED
HAND WATERING	ALLOWED	ALLOWED	NOT ALLOWED	NOT ALLOWED
DRIP IRRIGATION ¹	ALLOWED	ALLOWED	NOT ALLOWED	NOT ALLOWED
SUBSURFACE IRRIGATION ²	ALLOWED	ALLOWED	NOT ALLOWED	NOT ALLOWED
ATHLETIC FIELD IRRIGATION	ALLOWED	ALLOWED	NOT ALLOWED	NOT ALLOWED
NEW TURF WATERING EXEMPTION ³	NO NEW PERMITS	NO NEW PERMITS	NO NEW PERMITS	NO NEW PERMITS

1. Drip irrigation is the slow, even application of low-pressure water to soil and plants using plastic tubing placed directly at the root zone.
2. Subsurface irrigation is irrigation that occurs underground, down as far as 9-12" to effectively irrigate the root zone with much less potential for evaporation than traditional spray irrigation systems.
3. Exemptions granted prior to the declaration of a water shortage would continue to be honored until the 45-day period has expired.

(1) *Stage 1*. In Stage 1, the Town shall publicize and request the public to comply with the following conservation measures:

- a. Spray irrigation is limited to once per week. Hand watering is permitted every day. Athletic field irrigation is permitted.

- b. No new 45-day landscape permits shall be issued. Permits already issued during a Stage 1 declaration would continue to be honored until the 45-day period has expired.
- c. Reuse household water when possible, (within State gray water laws).
- d. Limit vehicle washing to the minimum.
- e. Refrain from washing down outside areas such as sidewalks, patios, etc.
- f. Use shower for bathing rather than bathtub, and limit shower to no more than four minutes.
- g. Limit flushing of toilets by multiple usages.
- h. Refrain from leaving faucets running while shaving or while rinsing dishes.
- i. Limit the use of clothes washers and dishwashers and when used, to operate fully loaded.
- j. Install water-flow restrictive devices in showerheads.
- k. Use disposable and biodegradable dishes.
- l. Install water-saving devices such as bricks, plastics, bottles or commercial units in toilet tanks.
- m. Limit hours of operation of water-cooled air conditioners.

(2) Stage 2. In Stage 2, the Town shall continue all recommendations of Stage 1 and the following measures shall be mandatory:

- a. Spray irrigation is not allowed. Hand watering is permitted.
- b. Filling of newly constructed or drained swimming or wading pools shall require the approval of the Public Works & Utilities director. Makeup water is allowed for maintaining the operation of swimming or wading pools.
- c. No introducing water into any ornamental fountain, pool or pond or other structure making similar use of water.
- d. No using water from public or private fire hydrants for any purposes other than fire suppression or other public emergency.
- e. Watering for dust control or compaction shall require the approval of the Public Works & Utilities director.
- f. No using water for any unnecessary purpose or intentionally wasting water.

(3) Stage 3. In Stage 3, all the provisions of Stages 1 and 2 apply and, in addition, the following measures shall be mandatory:

- a. Spray irrigation is not allowed. Hand watering is not allowed. The irrigation of athletic fields is not allowed.
- b. No nonessential use of water for commercial or public use, and the use of single service plates and utensils is encouraged and recommended in restaurants.
- c. No washing down outside areas such as streets, driveways, service station aprons, parking lots, office buildings, exterior of existing or newly constructed homes or apartments, sidewalks, or patios, or use of water for other similar purposes.
- d. Washing of vehicles is not permitted.

(4) Emergency/Rationing Stage. In this stage, all the provisions of Stages 1 through 3 apply and, in addition, the following measures are mandatory:

- a. No using water outside of structures for any use other than emergencies involving fire. Fire protection will be maintained, but where possible, tank trucks shall use raw water.
- b. All industrial uses of water are prohibited.

c. All other uses of water will be limited to those uses necessary to meet essential health and safety needs of customers.

d. No introducing water into swimming pools.

(Ord. of 2-2-99, § 1; Ord. of 3-20-00, § 1; Ord. No. 07-0807-09, § 3, 8-7-07)

Sec. 12-103. Violation, enforcement, and penalties.

(a) *Violations*. It shall be unlawful for any person to violate any provision of this division including any mandatory water conservation measure.

(b) *Criminal penalties*. Violations of this section shall not be a crime under G.S. 14-4, or other law.

(c) *Civil penalties*. Any person who violates this division is subject to a civil penalty of up to \$1,000.00 per violation per day for so long as the violation exists. Violations and penalties shall be determined by the Public Works & Utilities director. In determining the amount of a civil penalty, the Public Works & Utilities director shall take into account all relevant circumstances, including, but not limited to, the extent of harm caused by the violation, the magnitude and duration of the violation, efforts to correct the violation, the compliance history of the parties against whom the violation is assessed, the cost of enforcement to the Town, whether the violation was willful or intentional and any other factor as justice requires. The Town shall serve a written citation on the violator, and the customer if different, by personal delivery or by certified or registered mail, return receipt requested. The citation shall describe the violation and shall specify the amount of the civil penalty levied. If a person fails to pay a civil penalty within ten days after receiving written notice of violation, then the Town may recover the penalty through a civil action in the nature of debt, including all further accruing penalties for continuing violations.

(d) *Continuing violation*. Each day that a violation continues shall constitute an additional and separate violation.

(e) *Discontinuance of service*. The Town may discontinue service to a customer upon a determination by the Public Works & Utilities director that the customer violated a provision of this division. Prior to discontinuance, the Public Works & Utilities director shall give the customer written notice of the violation and an opportunity to contest the discontinuance within 48 hours.

(f) *Multiple remedies*. The Town may seek to enforce this division through any appropriate equitable or legal action or through any combination of these or the foregoing remedies.

(g) *Appeal*. A person who is assessed civil penalties or whose service is discontinued may appeal to the board of adjustment by serving written notice to the Town clerk within ten days of the service of citation or notice of discontinuance. An order of discontinuance is not stayed pending appeal to the board of adjustment.

(Ord. of 2-2-99, § 1; Ord. No. 07-0807-09, § 4, 8-7-07)

Sec. 12-104. Reserved.