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City of Durham

Water Shortage Response Plan

Department of Water Management
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City of Durham

Water Shortage Response Plan

Prepared by: Vicki Westbrook, Assistant Director,
Sydney Miller, Water Resources Planning Manager,
and James Lim, Water Efficiency and Conservation Administrator

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

1. Background and Overview

The City of Durham provides potable drinking water to customers throughout the City and to portions of Durham County, including the majority of Research Triangle Park (see water system map, Appendix A). The City's water use is approximately 57% residential and 43% commercial, industrial and institutional; approximately 3.5% of the City's metered connections are dedicated to irrigation. Durham's Conservation Program, established in 1993, works with water customers to reduce water demand using a variety of mechanisms. Voluntary water efficiency is emphasized through educational opportunities such as presentations to civic and school groups and at large community events, and through incentives such as toilet rebates and showerhead exchanges. Additionally, a tiered rate structure is in place for single family residential customers to provide a significant financial incentive to use water efficiently.

All conservation and efficiency measures are aimed at reducing water usage, decreasing the demand on the water treatment plants and extending the life of the City's water supplies. The regulatory component of the program consists of three divisions of a water efficiency ordinance. Division 1 of the ordinance addresses year-round efficiency requirements, such as an irrigation schedule, rain or moisture sensor requirement, and the prohibition of certain types of water waste. In the event of a drought, water shortage or other emergency, conservation staff members implement and enforce the measures listed in Division 2 of the City's Water Efficiency Ordinance (Appendix B). Division 3 provides for remedies, enforcement, and variances.

The purpose of the Water Shortage Response Plan (WSRP) is to address short-term water shortages, which may be caused by drought, extreme service disruptions, or operational issues at facilities. This plan directs the implementation of the City's Water Efficiency Ordinance during a water shortage. The City of Durham is required by the State of North Carolina to have an approved WSRP under NC General Statute 143-355 (I). Rules governing Water Use During Drought and Other Water Emergencies (15A NCAC 02E. 0607) specify items that must be included in this plan. This WSRP was developed in accordance with the Water Shortage Response Plan Guidelines provided by the Division of Water Resources (January 2009).

2. Authorization

The City of Durham's City Manager, and in his or her absence the Deputy City Manager, shall be authorized to declare a Water Shortage for the City of Durham, NC, and to enact water shortage response provisions of Article VI of the Durham City Code when the conditions outlined in this plan occur. References to the City Manger in this plan refer to the designated Acting City Manager or Deputy City Manager in the City Manager's absence.

Primary Contact

City Manager
City Manager's Office
101 City Hall Plaza
Durham, NC 27701

Phone: (919)560-4222
Fax: (919)560-4949

Secondary Contact

Deputy City Manager
City Manager's Office
101 City Hall Plaza
Durham, NC 27701

Phone: (919)560-4222
Fax: (919)560-4949

3. Notification

Once a Water Shortage has been declared, and whenever the Water Shortage Response Stage (defined in Section 4 of the WSRP) changes, the following notifications will be made:

- a. The City Manager (or designee) shall notify Durham City Council as soon as possible following the imposition of any Water Shortage Response stage, if not prior to taking such action.
- b. The Director of Water Management (or designee) shall notify neighboring municipal and county contract water recipients, and City department heads.
- c. Designated public affairs staff shall take responsibility for contacting media, which will include television, radio, print, and electronic sources. Contact information for the Department of Water Management will be provided for additional information.
- d. The City of Durham's website will be updated to reflect current Water Shortage status and related restrictions on use.
- e. The City's Government TV station will provide current information regarding the current Water Shortage status and related restrictions on use via bulletin boards and other programming opportunities.
- f. When warranted, telephone notifications to Durham residents will be made using the Everbridge "Alert Durham!" system. Coordination of this effort will be made between the Water Management staff and Durham County Emergency Management.

- g. The Director of Water Management (or designee) will issue electronic notification to business and community networks (e.g., list-serves and social media).
- h. The City of Durham will directly notify all customers of water restrictions via the water bill when a water shortage is declared and when a more restrictive stage is implemented.
- i. Water Efficiency and Conservation Program staff will notify irrigation contractors included in an opt-in notification list.

Additional public education efforts may also be made via public service announcements, additional news releases, school and community presentations, expanded web campaigns and social networking media. These additional efforts may include information on ways to voluntarily reduce water use beyond those required by the mandatory restrictions.

4. Levels of Response

The following levels of response (stages) shall be required when a Water Shortage is declared. The implementation of stages shall be based on the severity of the water shortage, as determined by available water supply and current water demand. A Water Supply Model will be used to help assess conditions and evaluate water supply and city-wide consumption.

The City of Durham operates under a year-round efficiency ordinance, requiring basic outdoor efficiency requirements. These requirements are addressed in Division 1 of the City's Water Efficiency Ordinance.

1. The following stages are implemented during a declared water shortage, based on the triggers described in section 5 and are excerpted from Division 2 of the City of Durham Water Efficiency Ordinance (Appendix B).

Table 4.1 summarizes the major components required by each stage.

Stage 1 Water Shortage

Upon declaration of a Stage 1 water shortage, users shall comply with the following measures:

1. *Spray Irrigation.* Users shall not operate spray irrigation systems more than one day per week as specified by the Director of Water Management and based on the location address. Irrigation may not occur between 10:00 a.m. and 6:00 p.m.
2. *Irrigation Exemptions.* The restrictions in (1) above shall not apply to the following:
 - a. Properties using drip irrigation, hand watering, or tree or shrub watering bags;
 - b. Watering of containerized plants and commercial plant stock in trade for sale;
 - c. Irrigation for a maximum of one day necessary when treatment with an application of chemicals requires immediate watering to preserve an existing landscape or to establish a

- new landscape, provided that such irrigation does not occur between the hours of 10:00 a.m. and 6:00 p.m.;
- d. Visually supervised operation of irrigation systems for short periods of time to check system condition and effectiveness;
 - e. Recreational fields, golf courses, and botanical sites operated in compliance with an approved Water Conservation Plan;
 - f. New landscape exemptions granted *prior* to the declaration of a water shortage. Such exemptions will continue to be honored until the original expiration date of the exemption. No exemptions shall be issued while a water shortage declaration is in effect.
 - g. Properties on which water use is in compliance with an approved Water Conservation Plan.
3. *Additional Requirements.* In addition to the above restrictions, no User shall:
 - a. Add water to any decorative fountain, pool or pond except where the water is recycled.
 - b. Serve water in a restaurant or similar establishment except upon request.
 - c. Add water to wading pools or swimming pools except to the extent necessary to replenish losses due to evaporation or spillage, and maintain operation of chemical feed equipment.
 4. *Water Consumption Reduction Goal.* Users of more than 100,000 gallons a day shall attempt to reduce water consumption by 15% and shall document such efforts. The goal for Stage 1 for Water Conservation Plans submitted by large users and other special users shall be to reduce consumption by 15%.

Stage 2 Water Shortage

Upon declaration of a Stage 2 water shortage, users shall continue to comply with Stage 1 measures, and with the following additional Stage 2 measures, which supplant Stage 1 requirements where they are more restrictive:

1. *Spray Irrigation.* Spray irrigation of landscapes with City water shall be prohibited.
2. *Irrigation Exemptions.* The restrictions in (1) above shall not apply to the following:
 - a. Properties using drip irrigation, hand watering, or tree or shrub watering bags;
 - b. Watering of containerized plants and commercial plant stock in trade for sale;
 - c. Irrigation for a maximum of one day necessary when treatment with an application of chemicals requires immediate watering to preserve an existing landscape, provided that such irrigation does not occur between the hours of 10:00 a.m. and 6:00 p.m.;
 - d. Visually supervised operation of irrigation systems for short periods of time to check system condition and effectiveness;
 - e. Recreational fields, golf courses, and botanical sites operated in compliance with an approved Water Conservation Plan;
 - f. New landscape exemptions granted *prior* to the declaration of a water shortage. Such exemptions will continue to be honored until the original expiration date of the exemption. No exemptions shall be issued while a water shortage declaration is in effect.
3. *Vehicle Washing.* Users shall not use City water to wash vehicles, except at commercial or institutional car washes. Commercial or institutional car washes shall be allowed to operate if they comply with the requirements of this ordinance.
4. *Surface Washing.* No City 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 surfaces or decks prior to painting or re-painting, or for any *surface where a health or safety issue arises.*
5. *Water Consumption Reduction Goal.* Users of more than 100,000 gallons a day shall attempt to reduce water consumption by 30% from pre-declaration consumption and shall document such

efforts. The goal for Stage 2 for Water Conservation Plans submitted by large users and other special users shall be to reduce consumption by 30%.

Stage 3 Water Shortage

Upon declaration of a Stage 3 water shortage, users shall continue to comply with Stage 1 and 2 measures, and with the following additional Stage 3 measures, which supplant Stage 1 and 2 requirements where they are more restrictive:

1. No City water shall be used for the purpose of irrigation except for watering of containerized plants and commercial plant stock in trade for sale.
2. No City water shall be used for any other outdoor purpose, except for emergency fire suppression or other activities necessary to maintain public health, safety, or welfare.
3. The use of City water for heating and/or cooling purposes shall be reduced in all but the most essential facilities to the extent practical in consideration of the indoor air quality standards, weather conditions, and health and safety requirements.
4. No City water shall be used to wash any motor vehicle except at commercial or institutional car washes that are in compliance with the requirements of this ordinance.
5. *Water Consumption Reduction Goal.* Users of more than 100,000 gallons a day shall attempt to reduce water consumption by 50% from pre-declaration consumption and shall document such efforts. The goal for Stage 3 for Water Conservation Plans submitted by large users and other special users shall be to reduce consumption by 50%.

Notwithstanding the restrictions specified in (3), the protection of public health, safety and welfare may, under special circumstances, require the use of limited amounts of city water. Such uses shall be permitted during declared water shortages, provided that other practical alternatives are not available and water is used in the least amount practical.

Stage 4 Water Emergency

Upon declaration of a water supply emergency, users shall continue to comply with Stage 1, 2 and 3 measures, and with the following additional Stage 4 measures, which supplant Stage 1, 2 and 3 requirements where they are more restrictive:

2. All outdoor uses of water are prohibited, except for emergency fire suppression or other activities necessary to maintain public health, safety, or welfare.
3. The use of water for washing or cleaning mobile equipment including automobiles, trucks, boats and fleet vehicles is prohibited.
4. No user shall add water to decorative fountains, pools, or ponds.
5. No user shall add water to wading pools or swimming pools, including hot tubs, spas and whirlpool tubs except for health and rehabilitative purposes as prescribed by a medical doctor or administered by a medical facility.
6. All other uses of water will be limited to those necessary to meet minimum health and safety needs of the customers as determined by the City Manager upon consultation with the Director of Water Management in light of conditions present. Water service may be discontinued or reduced to designated users or in designated portions of the City 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.
7. The City Manager may enact additional measures aimed at reducing water use for any users as conditions warrant. Users shall comply with any directives issued by the City Manager to this effect.

Table 4.1: Water shortage response stage summary for major components.

Activity	Year-Round Efficiency Requirements	Water Shortage Response Stages			
		Stage 1	Stage 2	Stage 3	Stage 4
Spray Irrigation	Three Days per Week	One Day Per Week	Not Allowed	Not Allowed	Not Allowed
Hand Watering, Drip irrigation, Subsurface irrigation	Allowed	Allowed	Allowed	Not Allowed	Not Allowed
New Landscape Exemption License	Allowed	No New Licenses	Not Allowed	Not Allowed	Not Allowed
Vehicle Washing	Allowed	Allowed	Limited to Efficient Commercial Facilities	Limited to Efficient Commercial Facilities	Not Allowed
Surface Washing	Allowed	Allowed	Allowed Prior to Painting*	Not Allowed*	Not Allowed*

*May be allowed to protect public health and safety.

Additional Drought-Related Mandatory Construction Restrictions

Upon receiving a report from the City Manager that additional water conservation measures are necessary to adequately address a water shortage, the City Council may declare by resolution that an existing water shortage requires imposition of Stage 2, 3, or 4 mandatory drought-related construction restrictions. Such action shall be taken separately from the imposition of water conservation stages described above. The Council’s resolution may declare one or more stages of mandatory construction restrictions, and may, additionally authorize the City Manager to declare subsequent stages of construction restrictions. The City Council may modify or terminate any stage of mandatory drought-related construction restrictions upon determining that the restrictions are no longer necessary, or by resolution may authorize the Manager to do the same. See Appendix B for a complete list of the additional drought-related mandatory construction restrictions. Please note that the imposition or rescission of these measures does NOT affect the mandatory measures or triggers established for Stages 1, 2, 3, and 4, above.

5. Water Shortage Response Triggers

Water shortage response triggers define the points at which each stage of mandatory restrictions will be implemented. Triggers are based on the ability to meet the water demands of City’s water customers and are influenced by a set of factors that directly relate to the City’s water system. These include, but are not limited to, lake elevations, treatment capacity, current demand, water supply model results, raw water intake structures and supply lines, elevated storage tanks, the availability of water from neighboring systems, and the distribution system. Department of Water Management staff monitors the status of these factors to determine if a water shortage condition is developing or exists and advises the City Manager accordingly.

The City of Durham relies on the combined usable reservoir storage volume as the key input for determining movement to more or less restrictive levels of potable water use. Table 5.1 below describes the triggers for increasing stages of Water Shortage Response. The Water Shortage Response Triggers are based on the probability of reaching a specified storage level (i.e., the percentage of combined remaining usable water storage volume easily accessed from Durham’s water supply reservoirs) by the end of the forecast horizon (i.e., a number of weeks into the future from the day of the forecast), as forecasted by the water supply model.

Table 5.1: Water Shortage Response Triggers, based on the probability of reaching the percentage of combined remaining storage in Durham's water supply reservoirs in the forecast horizon.

Stage	Response Triggers: Probability of Reaching Storage Level in Forecast Horizon		
	Probability of Reaching Storage Level at End of Forecast Horizon	Forecast Horizon (weeks)	Combined Usable Storage
Move to Stage 1	30 %	12	45 %
Move to Stage 2	20 %	10	35 %
Move to Stage 3	10 %	8	25 %
Move to Stage 4 (Emergency)	5 %	4	15 %

Department of Water staff may advise the purchase of water from an interconnected water system rather than the imposition of a Stage if such would reduce the demand on the City’s own water supply storage, thus reducing the probability of reaching a particular storage level; or for some other consideration such as a favorable weather forecast within the forecast horizon. Department of Water staff may also advise activation of alternative water supply storage, such as Teer Quarry.

Rescission of stages can occur when reservoir volumes increase and the forecast indicates at least a 95% probability of reaching a 95% combined usable storage volume by the end of a 10 week forecast horizon. Table 5.2 below describes the trigger for rescinding Water Shortage Stages.

Table 5.2: Trigger for rescinding Water Shortage Stages, based on the probability of reaching the percentage of combined remaining storage in Durham's water supply reservoirs in the forecast horizon.

Stage	Rescission Trigger: Probability of Reaching Storage Level in Forecast Horizon		
	Probability of Reaching Storage Level at End of Forecast Horizon	Forecast Horizon (weeks)	Combined Usable Storage
Rescind One or More Stages	95 %	10	95 %

The City Manager may, based on other factors and upon advisement from the Department of Water Management, declare a Water Shortage and implement Stages *before* a trigger is reached, sooner than indicated in Table 5.1. Likewise, the Manager may delay rescinding a Stage more slowly than indicated by Table 5.2, even when conditions are improving. Further, Stage escalation and/or regression may not always occur in a sequential fashion, particularly when conditions change rapidly or without warning.

Other factors that may be considered include but are not limited to:

- Drought Advisory issued by NC Drought Management Advisory Council
- Water supply status of neighboring water utilities
- A temporary or emergency system occurrence that creates a condition such that demand could exceed supply
- Water quality concerns from accidental or intentional contamination of the water system

Inability to distribute water through part of the water system

6. Enforcement

Compliance with the requirements of the Water Shortage Response Plan is required by the Water Efficiency Ordinance (Chapter 70, Article VI of the Durham City Code, Appendix B). Civil penalties are associated with violations and are specified in the Water Efficiency Ordinance as well.

The City employs Water Efficiency and Conservation Program staff that regularly enforces the year-round water efficiency ordinance. During a declared water shortage, these staff members will be the primary enforcement agents for the City, and will continue to enforce all outdoor water use restrictions. Additional staff members will be deployed as needed to achieve the desired system-wide compliance.

Compliance with indoor water use reductions will be evaluated using billing usage data. Commercial, Industrial, and institutional customers that use over 100,000 gallons of water per day are required to have a Water Conservation Plan, and shall implement phases of their plan as warranted by the current water shortage response stage. Consumption by these customers shall be tracked via billing data.

City staff will audit/monitor water use more often as conditions warrant and/or if expected overall system water use does not decrease as needed.

Citizens will be able to report witnessed violations to the Department of Water Management by calling Durham One Call, via email to savewater@durhamnc.gov or by using an online web form. Water Efficiency and Conservation Program staff will make a concerted effort to follow-up with each received report in an appropriate manner.

7. Variance Protocols

Administrative variances of the restrictions in the Water Shortage Response Division of the Water Efficiency Ordinance may be issued by the Director of Water Management provided that the general intent of the Water Shortage response measures is met, compliance is proven to cause practical difficulties and unnecessary hardship, and all reasonable options for abatement through modified water management have been exhausted. The criteria to determine hardship shall include, but not be limited to, the level of capital outlay and time required to achieve compliance.

Variances may be issued for a time-limited period and shall stipulate both short-term corrective measures and a schedule for completion of long-term corrective measures. Variances may be renewed depending on the justification.

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, purpose of water use, and the prevention of structural damage.

8. Measure of Effectiveness

The effectiveness of the City of Durham's Water Shortage Response measures will be determined by tracking system-wide consumption. Comparisons will be made to consumption prior to the imposition of any water shortage response stages as well as historical seasonal data. Variables other than water use restrictions that may impact reduction goals will be considered. Some of these include frequency of plan activation, total number of violation citations, desired reductions attained, and consumer response. Table 8.1 indicates the reduction goals for each stage, depending on the time of year.

Table 8.1: Anticipated Water Use Reductions as a result of Water Shortage Response Stage Implementation.

Water Shortage Response Stage	Reduction Goals, Relative to Normal Use	
	May – October	November - April
Stage 1	15%	7%
Stage 2	30%	12%
Stage 3	40%	17%
Stage 4 (Emergency)	55%	30%

9. Public Comment

A public review of this Water Shortage Response Plan was required prior to its adoption in 2009. This plan was made available for public comment for a minimum of 30 days through the following venues:

- The draft WSRP was available online – comments were submitted via email or online form. Announcements of this availability were made to community and neighborhood list-serves, an opt-in email distribution list for irrigation and plumbing contractors, business email distribution lists, social networking sites and through a general news release to the media.

- The draft WSRP was presented to various members of the business community with comments accepted during the presentations.
- The draft WSRP and updated WSRP were presented at meetings of the Durham City Council, which offers a forum for public comment.

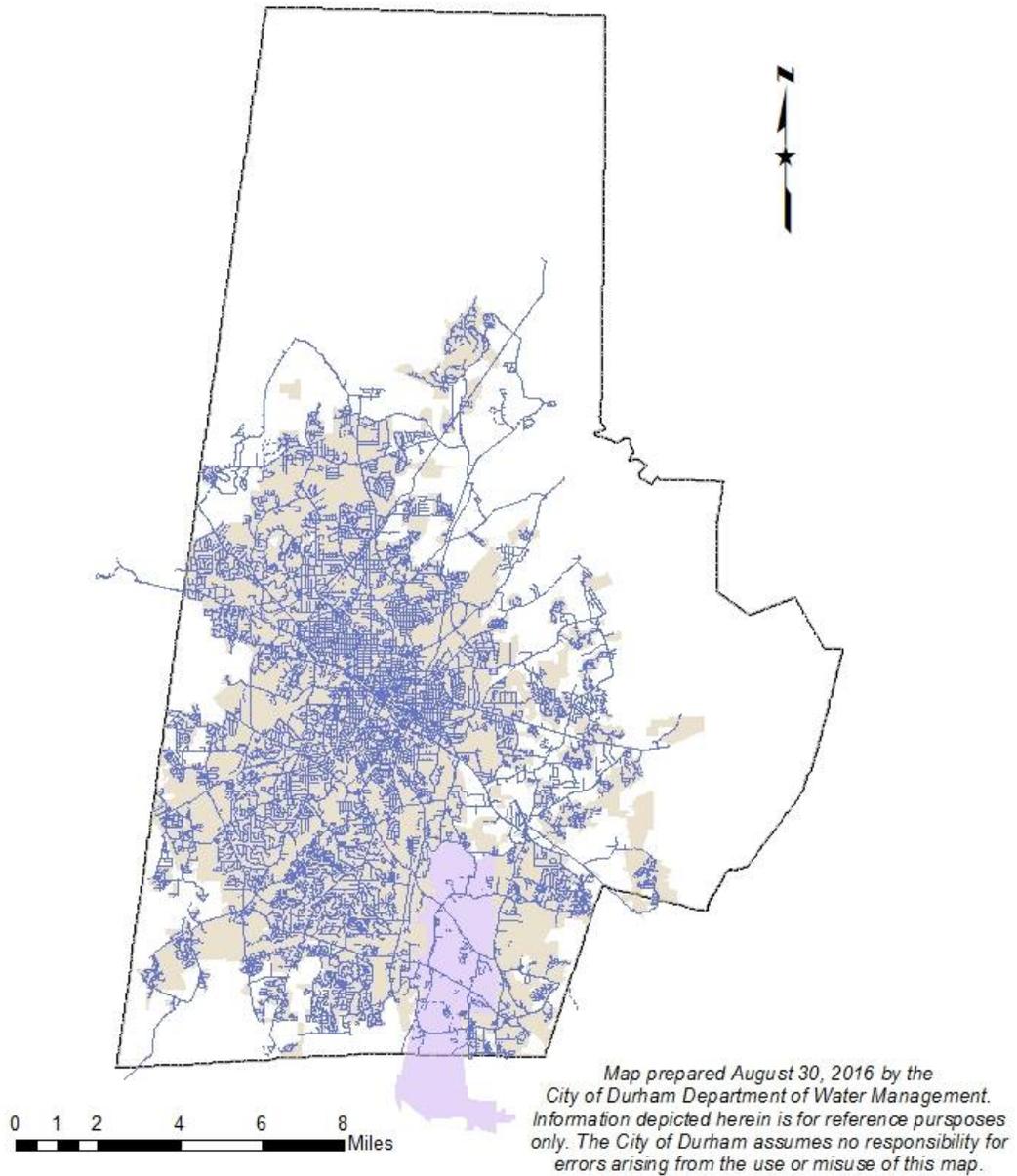
10. Plan Revision

The WSRP will be reviewed if there are new circumstances affecting water supply and/or demand, and following a Water Shortage declaration due to drought. If indicated by those reviews, or at a minimum of every five years as required by the provisions of GS 143-355 (I), the WSRP shall be updated. An opportunity for public comment will be provided for any update of the WSRP that specifically relates to the requirements imposed on the public before presentation to the City Council for approval. The City of Durham Department of Water Management Director (or designee) is responsible for initiating all WSRP updates.

The WSRP was updated to incorporate new Water Shortage Response Triggers, and to incorporate organizational changes in the Department of Water Management. The WSRP update was presented at a meeting of the Durham City Council prior to its adoption.

Appendix A: Water System Map

City of Durham Water Distribution System



Appendix B: City of Durham Water Efficiency Ordinance

DIVISION 1. - YEAR-ROUND WATER EFFICIENCY REQUIREMENTS

Sec. 70-552. - Definitions.

The definitions below are applicable to all divisions within this article. The following words and phrases and their derivation shall have the meaning as set forth below. The word "shall" is always mandatory and never directory.

City water means potable water supplied through pipes by the city to users.

Director means the director of the City of Durham's Department of Water Management or his/her designee.

Drip irrigation means the application of city water to the ground through drip emitter devices emitting drops or small streams at low pressure, volume, and velocity near or at ground level.

Even-numbered properties mean properties with addresses that end in even-numbered digits, and other properties so designated by the director.

Inspection means an entry into and examination of premises for the purpose of ascertaining compliance with the requirements of this article.

Installer means any person that constructs, installs and/or repairs irrigation systems.

Irrigate or *irrigation* means apply, or the application of, city water to outdoor soil or landscape surfaces.

Irrigation system means a device or combination of devices having a hose, pipe, or other conduit which transmits city water to outdoor soil or landscape surfaces.

Odd-numbered properties mean properties with addresses that end in odd-numbered digits, and other properties so designated by the director.

Public purpose athletic or recreational field means an athletic or recreational field owned or leased by a public or not-for-profit entity which is operated for public use, through general invitation and is not operated for the purpose of profit.

Public purpose botanical site means a site owned or leased by a public or not-for-profit entity in which a variety of plants are grown for scientific purposes or for education of the public.

Rain sensor means an automatic device that will override the irrigation cycle of an irrigation system and turn it off when a predetermined amount of rain has fallen or a moisture parameter is met that is equivalent to that amount of rain.

Recreational field means an athletic or recreational field that is not located at a residence.

Runoff means city water which is not absorbed by the outdoor surface to which it is applied.

Soil moisture sensor means a calibrated automatic device that is designed to measure the quantity of water contained in a material, such as soil, on a volumetric or gravimetric basis and override the irrigation cycle of the irrigation system and turn it off when a pre-determined soil moisture level is reached.

User means any person who is an owner or occupant of real property, whether inside or outside of the city, to which water is supplied by the city, or who uses water supplied by the city, or who is billed for water supplied by the city, or who is responsible for or otherwise has the right or permission to utilize water supplied by the city.

Water conservation plan means the plan submitted to the director by large users, botanical sites, recreational fields and other special water users specifying particular conservation measures, including irrigation measures, to be employed during stages of water shortage.

Water shortage response plan refers to a written plan required under state law that is approved by the director and the manager for submission to the state, and which establishes, among other things, various levels of response to water shortage and the triggers for such levels.

Water waste refers to any non-beneficial use of city water.

(Ord. No. 13919, 11-2-2009)

Sec. 70-553. - Purpose and intent.

It is the purpose and intent of this division to:

- (1) Assure that available water resources are put to reasonable beneficial uses and maximize the efficient use of the city water supply so as to potentially avoid unnecessary water supply expansion;
- (2) Reduce damage to publicly-owned streets and sidewalks caused by landscape runoff and overspray;
- (3) Increase safety on streets and sidewalks by reducing the potential for pooling and frozen water on such areas; and
- (4) Prevent pollution of streams, lakes, and other surface waters by reducing water runoff from landscaped areas.

This division shall be liberally construed to effectuate this purpose and intent.

(Ord. No. 13919, 11-2-2009)

Sec. 70-554. - Mandatory irrigation efficiency requirements.

The following requirements are applicable to all users:

- (1) *Year round irrigation schedule for spray irrigation systems.*
 - a. *Spray irrigation.* Users shall not operate spray irrigation systems more than three days per week and shall follow the following irrigation schedule:
 1. Even-numbered properties may be irrigated only on Sundays, Wednesdays, and/or Fridays.
 2. Odd-numbered properties may be irrigated only on Tuesdays, Thursdays, and/or Saturdays.
 3. Irrigation may not occur between 10:00 a.m. and 6:00 p.m.
 - b. *Exemptions from year round requirements.* The restrictions in subsection a. above shall not apply to the following:
 1. Properties using drip irrigation, hand watering, or tree or shrub watering bags;
 2. Watering of containerized plants and commercial plant stock in trade for sale;
 3. Outdoor irrigation necessary to establish newly sodded or seeded lawns or new non-turf plant materials within the first 45 days of planting provided that the customer secures a written license from director, and prominently displays the license. A limit of two licenses per address per year may be issued, and licenses may be revoked for any cause.
 4. Irrigation for a maximum of one day necessary when treatment with an application of chemicals requires immediate watering to preserve an existing landscape or to

establish a new landscape, provided that such irrigation does not occur between the hours of 10:00 a.m. and 6:00 p.m.

5. City water used to control dust or to compact soil when alternate methods are not available.
 6. Visually supervised operation of irrigation systems for short periods of time to check system condition and effectiveness.
 7. City water applied to prevent or abate health, safety, or accident hazards when alternate methods are not available.
 8. City water used for construction or maintenance activities where the application of water is the appropriate methodology and where no other practical alternative exists.
 9. Public purpose athletic fields, recreational fields, and botanical sites operated in compliance with a water conservation plan that has been approved by the director. The plan must specify the conservation measures and irrigation operating modes to be employed at the site year-round and during successive stages of a declared water shortage.
- (2) *Sensor requirement for new and existing irrigation systems.* Users and installers shall not install automatic irrigation systems of any type without a rain or soil moisture sensor that will prevent irrigation during periods of rainfall and when there is sufficient moisture in the ground for plant health and survival. Existing irrigation systems shall install a rain or soil moisture sensor by November 30, 2009.
- (3) *Sensor settings.* All rain sensors shall be adjusted and set so that they automatically shut off the irrigation system after not more than one-fourth inch of rainfall has occurred or an equivalent moisture parameter is reached. All rain sensors shall be installed according to manufacturer's instructions in a location that will provide full exposure to rainfall or appropriate moisture parameter such that accuracy of operation is assured. All rain sensors shall be maintained in good working condition. No person shall adjust either the rain sensor or irrigation system so that the sensor is not able to override and turn off the irrigation system after one-fourth inch of rain has fallen or an equivalent moisture parameter is reached.
- (4) *Hand operated equipment.* All hoses used for hand watering, vehicle washing, or other allowable outdoor uses shall be equipped with shutoff nozzles.
- (5) *System design.* All irrigation systems shall be designed, maintained, and operated to prevent, to the extent practicable, water from flowing onto paved or other impervious surfaces.

(Ord. No. 13919, 11-2-2009)

Sec. 70-555. - Prohibition of water waste.

No user shall:

- (1) Cause or allow run off of city water from landscape areas into adjoining impervious areas, adjacent property, or streets, sidewalks, gutters, stormwater drains, or other paved surfaces as a result of incorrectly directed or maintained sprinklers, irrigation systems, or other application devices, or excessive watering.
- (2) Cause or allow irrigation while precipitation is falling.
- (3) Knowingly allow water to escape through leaks, breaks or malfunction within the water user's plumbing or distribution system for any period of time beyond which such a leak or break should reasonably have been repaired or corrected. All leaks, breaks or malfunctions shall be corrected within 30 days of identification of the source of the leak.

- (4) Use or allow the use of water or flushing from any public or private fire hydrant for any purpose other than fire suppression, necessary fire hydrant or water distribution system maintenance, public emergency, or with prior approved written exception from the city.
- (5) Willfully or negligently waste water in a manner not otherwise prohibited above.
- (6) The prohibitions listed in the subsections above do not apply to:
 - a. Water waste that occurs prior to June 1, 2009;
 - b. Flow from firefighting, inspection of fire hydrants, fire training activities, or from similar government activities;
 - c. Water applied to prevent or abate health, safety, or other hazards when reasonable alternate methods are not available; and
 - d. Flow resulting from the inspection, operation, or maintenance of a public utility system.

(Ord. No. 13919, 11-2-2009)

Sec. 70-556. - Enforcement and variances.

This division may be enforced, and the provisions of this division may be varied, through the provisions contained in division 3.

(Ord. No. 13919, 11-2-2009)

Sec. 70-557. - Relationship to water shortage stages.

The requirements of this division may be superseded by a declaration of a water supply shortage or emergency, or by mandatory water restrictions set forth in division 2.

(Ord. No. 13919, 11-2-2009)

Secs. 70-558—70-562. - Reserved.

DIVISION 2. - WATER SHORTAGE RESPONSE REQUIREMENTS

Sec. 70-563. - Purpose and intent.

It is the purpose and intent of this division to ensure that available water resources are put to reasonable beneficial uses to avoid depletion of the city water supply during a water shortage. This division shall be liberally construed to effectuate such purpose and intent.

(Ord. No. 13919, 11-2-2009)

Sec. 70-564. - Response to water shortage.

The director shall report to the city manager conditions adversely affecting the city water supply that trigger mandatory restrictions prescribed by the city's water shortage response plan. Upon receiving such report, the city manager will declare a water shortage to exist and will enact the appropriate stage of water restriction as outlined in the city's water shortage response plan. The restrictions required under each stage shall be as set forth in this division. The city manager or the city council may terminate any

stage of water restriction once the triggers for rescission prescribed by the water shortage response plan occur. The imposition of drought-related mandatory construction restrictions shall be in accordance with section 70-567.

(Ord. No. 13919, 11-2-2009)

Sec. 70-565. - Water conservation plan requirements for large users and others.

All users of more than 100,000 gallons per day, or that own botanical sites, or recreational fields, or golf courses, and other users whose water use is determined by the director to be unique or amenable to individually-determined controls shall have a water conservation plan on file with the department of water management. New users shall submit such a plan within six months of beginning operation, or within such time period as allowed by the director. The plan must specify the conservation measures to be used by the site or sites of the entity during successive stages of a declared water shortage, which measures shall be targeted to achieve the general percentage reductions for each stage as set forth in this article. For botanical sites and recreational fields, the plan must specify the irrigation operating modes to be employed at the site year-round and during successive stages of a declared water shortage. The director may approve, disapprove, or require modifications to the plan. An approved plan may vary the requirements of this division. The user shall operate in accordance with the approved plan and shall keep records as required to document compliance with the plan. Users that do not have an approved plan are subject to all of the requirements of this division.

(Ord. No. 13919, 11-2-2009)

Sec. 70-566. - Mandatory water restriction stages.

- (a) *Stage 1 water shortage.* Upon declaration of a stage 1 water shortage, users shall comply with the following measures:
- (1) *Spray irrigation.* Users shall not operate spray irrigation systems more than one day per week as specified by the director and based on the location address. Irrigation may not occur between 10:00 a.m. and 6:00 p.m.
 - (2) *Irrigation exemptions.* The restrictions in subsection (1) shall not apply to the following:
 - a. Properties using drip irrigation, hand watering, or tree or shrub watering bags;
 - b. Watering of containerized plants and commercial plant stock in trade for sale;
 - c. Irrigation for a maximum of one day necessary when treatment with an application of chemicals requires immediate watering to preserve an existing landscape or to establish a new landscape, provided that such irrigation does not occur between the hours of 10:00 a.m. and 6:00 p.m.;
 - d. Visually supervised operation of irrigation systems for short periods of time to check system condition and effectiveness;
 - e. Recreational fields, golf courses, and botanical sites operated in compliance with an approved water conservation plan;
 - f. New landscape exemptions granted prior to the declaration of a water shortage. Such exemptions will continue to be honored until the original expiration date of the exemption. No exemptions shall be issued while a water shortage declaration is in effect.
 - g. Properties on which water use is in compliance with an approved water conservation plan.
 - (3) *Additional requirements.* In addition to the above restrictions, no user shall:
 - a. Add water to any decorative fountain, pool or pond except where the water is recycled.

- b. Serve water in a restaurant or similar establishment except upon request.
 - c. Add water to wading pools or swimming pools except to the extent necessary to replenish losses due to evaporation or spillage, and maintain operation of chemical feed equipment.
- (4) *Water consumption reduction goal.* Users of more than 100,000 gallons a day shall attempt to reduce water consumption by 15 percent and shall document such efforts. The goal for stage 1 for water conservation plans submitted by large users and other special users shall be to reduce consumption by 15 percent.
- (b) *Stage 2 water shortage.* Upon declaration of a stage 2 water shortage, users shall continue to comply with stage 1 measures, and the following additional stage 2 measures, which supplant stage 1 requirements where they are more restrictive:
- (1) *Spray irrigation.* Spray irrigation of landscapes with city water shall be prohibited.
 - (2) *Irrigation exemptions.* The restrictions in subsection (1) shall not apply to the following:
 - a. Properties using drip irrigation, hand watering, or tree or shrub watering bags;
 - b. Watering of containerized plants and commercial plant stock in trade for sale;
 - c. Irrigation for a maximum of one day necessary when treatment with an application of chemicals requires immediate watering to preserve an existing landscape, provided that such irrigation does not occur between the hours of 10:00 a.m. and 6:00 p.m.;
 - d. Visually supervised operation of irrigation systems for short periods of time to check system condition and effectiveness;
 - e. Recreational fields, golf courses, and botanical sites operated in compliance with an approved water conservation plan;
 - f. New landscape exemptions granted prior to the declaration of a water shortage. Such exemptions will continue to be honored until the original expiration date of the exemption. No exemptions shall be issued while a water shortage declaration is in effect.
 - (3) *Vehicle washing.* Users shall not use city water to wash vehicles, except at a commercial or institutional car wash facility. Commercial or institutional car washes shall be allowed to operate if they comply with the requirements of this article.
 - (4) *Surface washing.* No city 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 surfaces or decks prior to painting or repainting, or for any surface where a health or safety issue arises.
 - (5) *Water consumption reduction goal.* Users of more than 100,000 gallons a day shall attempt to reduce water consumption by 30 percent from pre-declaration consumption and shall document such efforts. The goal for stage 2 for water conservation plans submitted by large users and other special users shall be to reduce consumption by 30 percent.
- (c) *Stage 3 water shortage.* Upon declaration of a stage 3 water shortage, Users shall continue to comply with stage 1 and 2 measures, and the following additional stage 3 measures, which supplant stage 1 and 2 requirements where they are more restrictive:
- (1) No city water shall be used for the purpose of irrigation except for watering of containerized plants and commercial plant stock in trade for sale.
 - (2) No city water shall be used for any other outdoor purpose, except for emergency fire suppression or other activities necessary to maintain public health, safety, or welfare.
 - (3) The use of city water for heating and/or cooling purposes shall be reduced in all but the most essential facilities to the extent practical in consideration of the indoor air quality standards, weather conditions, and health and safety requirements.

- (4) No city water shall be used to wash any motor vehicle except at commercial or institutional car washes that are in compliance with the requirements of this article.
- (5) Water consumption reduction goal. Users of more than 100,000 gallons a day shall attempt to reduce water consumption by 50 percent from pre-declaration consumption and shall document such efforts. The goal for stage 3 for water conservation plans submitted by large users and other special users shall be to reduce consumption by 50 percent.

Notwithstanding the restrictions specified in subsection (c), the protection of public health, safety, and welfare may, under special circumstances, require the use of limited amounts of city water. Such uses shall be permitted during declared water shortages, provided that other practical alternatives are not available and water is used in the least amount practical.

- (d) *Stage 4 water supply emergency.* Upon declaration of a water supply emergency, users shall continue to comply with stage 1, 2 and 3 measures, and the following additional stage 4 measures, which supplant stage 1, 2 and 3 requirements where they are more restrictive:
 - (1) All outdoor uses of water are prohibited, except for emergency fire suppression or other activities necessary to maintain public health, safety, or welfare.
 - (2) The use of water for washing or cleaning mobile equipment including automobiles, trucks, boats and fleet vehicles is prohibited.
 - (3) No user shall add water to decorative fountains, pools, or ponds.
 - (4) No user shall add water to wading pools or swimming pools, including hot tubs, spas and whirlpool tubs except for health and rehabilitative purposes as prescribed by a medical doctor or administered by a medical facility.
 - (5) All other uses of water will be limited to those necessary to meet minimum health and safety needs of the customers as determined by the city manager upon consultation with the director in light of conditions present. Water service may be discontinued or reduced to designated users or in designated portions of the city 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.
 - (6) The city manager may enact additional measures aimed at reducing water use for any users as conditions warrant. Users shall comply with any directives issued by the city manager to this effect.

(Ord. No. 13919, 11-2-2009)

Sec. 70-567. - Additional drought-related mandatory construction restrictions.

Upon receiving a report from the city manager that additional water conservation measures are necessary to adequately address a water shortage, the city council may declare by resolution that an existing water shortage requires imposition of stage 2, 3, or 4 mandatory drought-related construction restrictions. Such action shall be taken separately from the imposition of water conservation stages described in the previous section of this division. The council's resolution may declare one or more stages of mandatory construction restrictions, and may, additionally authorize the city manager to declare subsequent stages of construction restrictions. The city council may modify or terminate any stage of mandatory drought-related constructions restrictions upon determining that the restrictions are no longer necessary, or by resolution may authorize the manager to do the same.

- (1) *Stage 2 water shortage—Additional drought-related mandatory construction restrictions.* The following restrictions shall be in place during the time that stage 2 construction restrictions have been declared, until such are modified or terminated:
 - a. Water lines permitted prior to imposition of stage 2 construction restrictions may be constructed, flushed, and placed into service;

- b. Water lines not permitted prior to imposition of stage 2 construction restrictions may be permitted and constructed, but shall be subject to stage 3 construction restrictions if such are declared prior to lines being flushed and placed into service
 - c. Structures with existing valid building permits that do not expire may be completed, with necessary individual water connections;
 - d. Building permits issued after declaration of stage 2 constructions restrictions are subject to stage 3 and/or stage 2 construction restrictions if such are declared prior to the permitting of a water connection or meter installation;
 - e. All water used for the flushing of water lines shall be collected and used only as permitted by the city;
 - f. Swimming pools, spas, and hot tubs not already in operation shall only be filled with non-city water, and receipts for purchases of such water shall be retained.
- (2) *Stage 3 water shortage—Additional drought-related mandatory construction restrictions.* The following restrictions shall be added to those in stage 2 above, or, where more exacting, shall supersede those restrictions, during the time that stage 3 construction restrictions are declared, until such as are modified or terminated.
- a. Water liens that were not permitted prior to imposition of stage 2 construction restrictions shall not be flushed or placed into service;
 - b. Water connections and meter installations shall not be allowed for structures that received building permits after stage 3 construction restrictions were declared;
 - c. Permits for the construction or installation of swimming pools, spas, hot tubs including any associated electrical work shall not be issued;
 - d. Plans for water liens shall be accepted and reviewed but no permit for extension or construction of a water line shall be issued;
 - e. All permits for water line extensions not already under construction shall be suspended.
- (3) *Stage 4 water emergency—Additional mandatory construction restrictions.* The following restriction(s) shall be added to those in stages 2 and 3 above, or, where more exacting, shall supersede those restrictions, during the time that stage 4 construction restrictions are declared, until such are modified or terminated.
- Certificates of occupancy for new structures requiring public water service shall not be issued until a return to stage 3 or a lower stage.
- (4) *Exceptions to construction restrictions.* Public projects are exempted from the above restrictions. In addition, any person may secure a written license from the city manager or his designee to engage in an activity prohibited under the additional mandatory construction restrictions where one or more of the following circumstances are demonstrated to exist:
- a. Service is for an existing residence with a contaminated or failed well and the residence has access to an existing water line;
 - b. Permits are for renovations to an existing structure with water service;
 - c. Peculiar and unique hardships exist involving one or more of the following, or similar situations: unsafe or temporary housing, subsidized housing involving unique permitting or financing arrangements; and responses to fire or other disasters which require the construction activity.

(Ord. No. 13919, 11-2-2009)

Sec. 70-568. - Scope and duration.

Water shortage response measures shall be applicable to all users of the system, including users located outside the city. Response measures shall be in force until they are terminated by the city manager or the city council. Notice of conservation measures shall be broadly reported to the media, and shall, where feasible, be included on customers' utility bills.

(Ord. No. 13919, 11-2-2009)

Sec. 70-569. - Enforcement and variances.

This division may be enforced, and the provisions of this division may be varied, through the provisions contained in division 3.

(Ord. No. 13919, 11-2-2009)

Secs. 70-570—70-572. - Reserved.

DIVISION 3. - REMEDIES, ENFORCEMENT, AND VARIANCES

Sec. 70-573. - Violations, enforcement, and penalties.

- (a) *Violation.* Noncompliance with the requirements of this article constitutes a violation, and is unlawful. Violations may be remedied through the provisions of this division which supplement any other civil and criminal remedies available under law. Remedies are not exclusive and may, without limitation, be exercised singly, in combination, or cumulatively.
- (b) *Enforcement.* The director shall enforce the requirements of this article, and shall issue notices, orders, assess penalties, and direct other actions as necessary. Among other things, the director is authorized to remediate any violations and, pursuant to written guidelines, modify previously issued penalties.
- (c) *Warnings; notice of violation.*
 - (1) *Warnings.* If a violation occurs, the director shall issue one or more warnings. At least one written warning shall be issued prior to issuance of the first notice of violation requiring corrective action and/or assessing a penalty. Subsequent oral or written warnings are not required if the violation is for the same activity, or lack thereof, that resulted in previous violations and penalties.
 - (2) *Notice of violation.* If the violation does not cease after one or more warnings, the director shall issue a written notice of violation to each responsible user. Such notice shall be given prior to ordering a corrective action, imposing a civil penalty, or terminating water service as the result of a violation.
 - (3) *Service.* Notice shall be served by one of the following means: personal delivery; certified or registered mail, return receipt requested; any means authorized for service of documents by Rule 4 of the NC Rules of Civil Procedure; or first class mail addressed to the violator accompanied by posting of the notice at the violator's residence or place of business, as may be appropriate.
 - (4) *Contents.* The notice shall identify the location of the violation; the responsible user(s); the nature of the violation; the time period, if any, allowed for corrective action; a city contact person and contact information; the process and deadlines for contesting the violation; and a general

description of potential enforcement actions available to the city, including but not limited to civil penalties and termination of water service.

- (d) *Civil penalty and discontinuation of utility service.* If, after issuance of notice of violation, the violation does not cease, the director may assess civil penalties in accordance with the schedule below. Increasing civil penalties and utility termination may only be imposed if the violation is for the same activity, or lack thereof, that resulted in the previous warning or civil penalty, and occurs within two years of the city's previous action regarding the matter.
 - (1) *Schedule of progressive steps and penalties.* The following actions and penalties may be imposed by the director. Civil penalties may be assessed only after the time period for an appeal has expired, or after a determination on an appeal has been made.
 - a. First violation: Corrective action.
 - b. Second violation: Civil penalty of \$100.00.
 - c. Third violation: Civil penalty of \$250.00.
 - d. Fourth violation: Termination of water service.
 - (2) *Discontinuance of water service.* The city may discontinue water service to any property upon the fourth violation, or upon nonpayment of the civil penalties that have been added to the user's utility bills pursuant to subsection (e). If termination is for a fourth violation, a notice of violation shall be sent as described above. If it is for nonpayment, the notice and procedures otherwise applicable in city ordinance shall apply. Service reconnection shall only be allowed upon payment of any past due utility bills, including but not limited to civil penalties and reconnection charges.
- (e) *Assessment of penalties.* Notice of civil penalties imposed shall be given by first class mail, and may subsequently be added to the violator's utility bills.

(Ord. No. 13919, 11-2-2009)

Sec. 70-574. - Variances.

- (a) Administrative variances of the restrictions in this article may be issued by the director provided that the general intent of this article is met, compliance is proven to cause practical difficulties and unnecessary hardship, and all reasonable options for abatement through modified water management have been exhausted. The criteria to determine hardship shall include but not be limited to the level of capital outlay and time required to achieve compliance.
- (b) Variances may be issued for a time-limited period, and shall stipulate both short-term corrective measures and a schedule for completion of long-term corrective measures. Variances may be renewed for good cause shown.

(Ord. No. 13919, 11-2-2009)

Sec. 70-575. - Appeal.

- (a) *Time for appeal.* A user may appeal a determination of a violation, or any penalty for violation to the director by filing an appeal within seven calendar days of receiving a notice of violation. The appeal shall identify the property and state the grounds of appeal together with all material facts in support thereof. Violations already appealed may not be appealed again if a determination regarding the contested facts has already been made.
- (b) *Meeting.* A User who appeals shall be offered the opportunity for a meeting with the director, and may present any information in addition to that presented in writing. Notice of the meeting time shall be sent certified or registered mail, return receipt requested.

(c) *Decision.* The decision of the director shall be in writing and shall explain the basis for the decision, and the penalty imposed. If corrective action is ordered, the director shall specify the time frame during which it must be taken so as to avoid additional penalties.

(Ord. No. 13919, 11-2-2009)

Secs. 70-576, 70-577. - Reserved.