

WATER SHORTAGE RESPONSE PLAN (WSRP) GUIDELINES

May 1, 2009

Introduction

All public and privately owned water systems subject to G.S. 143-355 (l) are required to submit a Water Shortage Response Plan (WSRP) with their Local Water Supply Plan (LWSP). Recently adopted rules governing water use during droughts and water emergencies (15A NCAC 02E .0607) and Session Law 2008-143 passed in July 2008 stipulate specific requirements that must be included in those plans. This document is written to help systems meet the above requirements by developing a community response plan tailored to local conditions. Systems without an approved WSRP will be required to implement the demand reduction measures outlined in the drought rules (15A NCAC 02E .0613 and .0614) when the county from which they get water is designated as experiencing extreme or exceptional drought conditions by the NC Drought Management Advisory Council.

Water shortage response planning should be considered separately and in addition to a year-round wise water use policies that encourage efficient use of water by all customers. A year-round water use policy is recommended for every community; however, normal conservation measures should not be included in your WSRP. The WSRP should focus on times when water is in short supply due to droughts or other emergency situations. A year-round water conservation policy should impress on your customers the value of conserving water everyday.

Keep in mind, drought is only one possible cause of a drinking water shortage; water systems may also experience short-term problems with water treatment or distribution. For these reasons, it is helpful to establish a WSRP that is responsive to all types of water shortages and that anticipates developing shortage situations.

1. Authority for WSRP Implementation

Identify who will be responsible for enacting your WSRP when the shortage severity triggers are reached. Provide their name, position title, and contact information. In addition, identify who is to implement the plan and make decisions in their absence. This section of the plan must make it clear that implementation of the WSRP is required when the specified trigger levels are reached. This requirement emphasizes the importance of adopting triggers that are tailored to your system's water sources and customer base. This step is important, as even the best written plans are ineffective if they cannot be implemented or if they are triggered by inappropriate shortage measures.

2. Notification of WSRP Activation and Conservation Measures

All water users and system employees should be notified when your WSRP has been implemented. Your plan should describe how this will be done. Broadcast media outlets, including community television, local news, and radio public service announcements are particularly useful in communicating this information quickly. The same media outlets should be used for all announcements of changes to requirements.

Your WSRP should outline the education and outreach strategies that will be used to inform customers about water use policies and restrictions. Again, consider your audience when deciding which methods will be most effective for your community. Below is a list of possible outreach options.

- Independent Mailings to Users
- Presentations/Workshops
- Bill Stuffers to All Customers
- Signs and Posters
- Websites
- Water Audits
- Community Newspapers
- Informational Videos
- TV Ads (community television)
- School Presentations
- Radio (public service announcements)
- Flyers/Handouts

3. Measuring Severity

The next step in developing your WSRP is to determine the characteristics of your sources of water that indicate reduced availability of water and establish multiple levels of severity for a drinking water shortage. Problems besides droughts can impact available water supplies. Therefore, severity impacts should be determined by specific measurements of available supply, demand, and system conditions; such as amount of remaining storage, water demand as a percent of supply, or water quality indicators. For each level of severity, a corresponding set of required water shortage responses should be developed.

4. Triggers and Responses

After determining the characteristics of your sources of water that would be good indicators of reduced availability, determine the appropriate measurements of those characteristics that will be used to trigger movement to more and less restrictive reduction measures. It is important to establish a series of measures that indicate various levels of shortage severity that correspond with each desired level of reduction measures. As a reference point, include the range of measurements of the selected water supply parameters under normal supply conditions. Examples of triggers for a three-stage plan for reservoir, run-of-river, and ground water supplied systems are listed below. You may decide that more than three stages are needed to manage demand in your system.

SYSTEM SUPPLY TYPE	VOLUNTARY LEVEL US Drought Monitor indicates abnormally dry or moderate drought in your area Conditions indicate potential for water supply shortages; voluntary conservation is encouraged.	MANDATORY LEVEL US Drought Monitor indicates moderate or severe drought in your area Water supplies are measurably lower than the seasonal norm and are diminishing. Mandatory restriction measures are imposed.	EMERGENCY LEVEL US Drought Monitor indicates exceptional drought in your area The system is experiencing a water shortage; drinking water supply is clearly inadequate and more stringent restriction measures must be imposed.
RESERVOIR (Monitor reservoir water levels daily during a water shortage situation.)	<ul style="list-style-type: none"> ▪ Less than ___ % of remaining usable storage ▪ Average daily use > ___ MGD for ___ consecutive days ▪ Reservoir levels less than ___ ft. of full pool ▪ Finished water storage less than ___ 	<ul style="list-style-type: none"> ▪ Less than ___ % of remaining usable storage ▪ Average daily use > ___ MGD for ___ consecutive days ▪ Reservoir levels less than ___ ft. of full pool ▪ Finished water storage less than ___ 	<ul style="list-style-type: none"> ▪ Less than ___ % of remaining usable storage ▪ Average daily use > ___ MGD for ___ consecutive days ▪ Reservoir levels less than ___ ft. of full pool ▪ Finished water storage less than ___
RUN-OF-RIVER (Measure streamflow daily and inventory watershed for upstream water users during a water shortage situation.)	<ul style="list-style-type: none"> ▪ Stream flow less than ___ cubic feet per second ▪ Water demand exceeds ___ % of flow above intake ▪ Average daily use > ___ MGD for ___ consecutive days ▪ Withdrawing ___ % of flow past the intake ▪ Finished water storage less than ___ 	<ul style="list-style-type: none"> ▪ Stream flow less than ___ cubic feet per second ▪ Water demand exceeds ___ % of flow above intake ▪ Average daily use > ___ MGD for ___ consecutive days ▪ Withdrawing ___ % of flow past the intake ▪ Finished water storage less than ___ 	<ul style="list-style-type: none"> ▪ Stream flow less than ___ cubic feet per second ▪ Water demand exceeds ___ % of flow above intake ▪ Average daily use > ___ MGD for ___ consecutive days ▪ Withdrawing ___ % of flow past the intake ▪ Finished water storage less than ___
GROUND WATER (Check water levels in wells weekly and monitor the number of hours each well is pumped daily during a water shortage situation.)	<ul style="list-style-type: none"> ▪ Aquifer levels ___ % (or ft.) below capacity ▪ Finished water storage less than ___ ▪ ___ % increase in pumping times to maintain storage and meet demand ▪ Pumping times required to maintain storage and meet daily demand exceed ___ hours ▪ Average daily use > ___ MGD for ___ consecutive days 	<ul style="list-style-type: none"> ▪ Aquifer levels ___ % (or ft.) below capacity ▪ Finished water storage less than ___ ▪ ___ % increase in pumping times to maintain storage and meet demand ▪ Pumping times required to maintain storage and meet daily demand exceed ___ hours ▪ Average daily use > ___ MGD for ___ consecutive days 	<ul style="list-style-type: none"> ▪ Aquifer levels ___ % (or ft.) below capacity ▪ Finished water storage less than ___ ▪ ___ % increase in pumping times to maintain storage and meet demand ▪ Pumping times required to maintain storage and meet daily demand exceed ___ hours ▪ Average daily use > ___ MGD for ___ consecutive days

Comprehensive Water Shortage Response Plans should also contain triggers for:

- Contamination / change in raw water quality.
- Equipment or facility failure.
- Line breaks, etc.

Levels of Response

When determining response actions, it is helpful to classify drinking water uses in your community based on the necessity for high quality potable water and the importance to the local economy and community structure. To begin, identify the types of customers in your system and classify them in subcategories of drinking water use according to the following types: essential, socially/economically important and non-essential drinking water uses. For each type, list customer groups and consider the amount of water needed daily. Consulting with representatives of some of the major water using groups and individual large water users can provide useful information for developing realistic expectations on the ability of water users to reduce drinking water use.

ESSENTIAL DRINKING WATER USES

Some drinking water uses depend on potable water to protect public health and safety. It will be helpful to identify the essential uses that require water from your distribution system, especially for sanitation and public health protection. Typically these will include:

- Domestic Uses
- Patient Care/Rehabilitative Services
- Residential Care Facilities (e.g. nursing homes)
- Correction Facilities
- Public Use (e.g. Fire fighting, health and safety purposes; water needed to sustain human and animal life; and water necessary to satisfy federal, state and local public health, safety or environmental protection requirements)

SOCIALLY / ECONOMICALLY IMPORTANT DRINKING WATER USES

Some uses of drinking water are important to maintain the social and economic structure of your community. Identifying these uses in your water system will help develop response measures that minimize disruptions to these uses while reducing overall system use. The following are some possible socially or economically important uses of potable water:

- Domestic (non-sanitation related)
- Industrial
- Commercial
- Institutional
- Outdoor (minimal amounts for plant and animal survival)
- Public Use (e.g. community landscapes or athletic fields)

NON-ESSENTIAL DRINKING WATER USES

Some everyday uses of water in your system do not require potable water to accomplish the desired task. When supplies are not limited using drinking water for these purposes is simple and convenient. During water shortages these uses can typically be restricted to significantly reduce system demand without endangering public health. The following are some examples of possible non-essential uses of potable water in your system:

- Ornamental Fountains (without aquatic habitats)
- Outdoor Turf and Landscape Watering
- Impervious Surface Washing (public/private)
- Vehicle Washing
- Dust Control
- Public Use (e.g. street cleaning)

Next, determine what voluntary and mandatory conservation levels are most appropriate for the types of uses in your community. Incremental, tiered levels (e.g. voluntary, mandatory, and emergency) of response with corresponding conservation measures should be developed to reduce demand for drinking water and extend the life of supplies when shortages occur. Conservation measures and water use restrictions should be appropriate for your system's mix of customers, local water use patterns and

conditions for each level of shortage severity. The goal of these actions is to avoid the need for more extreme measures if conditions worsen.

Below are examples of severity levels and suggested responses that you might consider including in your plan. Notice how specific triggers are required for movement between each level. Finally, plan for incrementally returning to normal water use as conditions improve based on a reversal of the procedure.

VOLUNTARY LEVEL: Water Use Reduction

When ____ shortage severity trigger is reached, the _____ shall declare a Drinking Water Shortage Alert and request customers to voluntarily reduce water use.

- Issue a water shortage advisory. Increase conservation educational campaign
- ____% potable water use reduction goal (system-wide as well as individual users)
- Request voluntary conservation from all water users
- Specific measures imposed by your system on water uses in your community

MANDATORY LEVEL: Water Use Restrictions (in addition to voluntary measures)

When ____ shortage severity trigger is reached the _____ shall declare Mandatory Drinking Water Use Reductions and initiate the following actions:

- Issue a water shortage alert
- ____% potable water use reduction goal (system-wide as well as individual users)
- Ban or restrict specific non-essential drinking water uses (adapted to your community's needs)
- Restrict specific socially & economically important uses of drinking water (adapted to your community's need)
- Monitor compliance with water use bans and enforce when necessary
- Specific restrictions imposed by your system on water uses in your community

EMERGENCY LEVEL: Water Use Restrictions/Bans (and/or Rationing)

When ____ shortage severity trigger is reached the _____ shall declare a Drinking Water Emergency and initiate the following actions:

- Issue a water shortage emergency
- Maximum ____% potable water use reduction goal (system-wide as well as individual users).
- Ban on all non-essential drinking water uses
- Ban or restrict specific socially & economically important drinking water uses (adapted to your community)
- Aggressive compliance monitoring and enforcement
- Enact advanced restriction pricing with fines for excessive use (can be done at Mandatory Level)
- Specific restrictions or bans imposed by your system on water uses in your community

5. Enforcement

Enforcement of your WSRP provisions will be essential if you want to get the levels of customer compliance and use reductions expected from your plan. Your WSRP should list the existing or proposed ordinance, code, regulation, resolution, etc. that establishes the authority on which your WSRP depends. It should also detail your system's protocols for water shortages and associated enforcement measures. List the enforcement measures to be used to ensure compliance with the water use restrictions for each level in your plan.

Consider how penalties and enforcement activities will change for first, second, and multiple offenses. Penalties may also increase according to the level of reductions in place when the infraction was committed, the severity of the offense, or a combination of the above.

Rate surcharges may be useful to enforce the water use restrictions and help your community reach its water conservation goals during water emergencies. Conservation pricing rates (e.g. increasing block rates, excess use surcharges, etc.) can also alleviate revenue losses that result from diminishing water sales. A common impact of reduced usage in response to supply shortages is a reduction in revenues. This impact can be tempered by implementing higher rates for water when supplies are short, similar to gasoline pricing.

6. Public Review

Without community support, even the best water shortage response plan will be unsuccessful. Invite public participation throughout the development of your WSRP and consider forming an advisory council representing your customers to offer input in the planning process. Similarly, before your WSRP is finalized, provide opportunities for public comment and review. While a public review process is not mandatory, it can greatly improve community acceptance and cooperation in implementing the plan. Upon approval by the Department your plan will have to be adopted by your local governing board. Typical this process will include the opportunity for public comment. Your WSRP should clearly state how and when your customers have the opportunity to review and comment on the plan prior to final adoption.

7. Variances and Variance Criteria

No matter how comprehensive your WSRP is, it is likely that you will receive requests for exemptions or variances from specific requirements when the plan has to be implemented. Your plan should outline any procedures that are established to receive and review variance applications. Also, explain the criteria that will be used to decide whether or not to grant a variance. Identifying objective evaluation criteria to consider and grant variance requests in your plan will provide valuable information to your customers. Including written criteria in the plan helps ensure that variance decisions are transparent and equitable.

8. Evaluation

It is important to evaluate the effectiveness of your Water Shortage Response Plan's provisions once they are implemented. Collecting data before, during, and after plan implementation allows you to measure actual use reductions in your community. Similarly, setting specific water use reduction goals provides an objective method for evaluating your plan's effectiveness. Determining what information is desired to evaluate plan effectiveness prior to implementation will aid in data collection and ensure the necessary information is available when needed. If expected use reductions are not achieved it may be necessary to revise the plan before it is needed again. Revisions might include establishing earlier trigger levels, escalating conservation and enforcement measures implemented at each level, or reclassifying select water uses.

9. Revision

Water Shortage Response Plans should be reviewed regularly to keep them up to date with changing conditions within your community. Circumstances warranting an updated plan might include new development or changes in the number or types of available water supplies. A post-implementation evaluation provides a good opportunity to revise the plan and improve its performance during the next drought. Local Water Supply Plans have to be updated at least every five years. You may want to review your Water Shortage Response Plans also at this time to see if it still meets your systems needs. All revised plans must be submitted to the Division of Water Resources for review and approval.

10. Impoundment Storage

If your water system depends on water storage in a reservoir that is owned by another entity; then your Water Shortage Response Plan must be consistent with the plan adopted by the owner of the reservoir. Upon the declaration of a water shortage, all water systems that depend on reservoirs owned by other systems should enforce the appropriate water use restrictions and percent reduction goals for each level of response that is established by the WSRP adopted by the owner of the reservoir.

11. Private Drinking Water Wells

Water Shortage Response Plans cannot be approved if they contain provisions that require metering or regulation of private drinking water wells as defined in General Statute 87-85.

Please remember, Water Shortage Response Plans should be adapted to the specific needs, values, and characteristics of *your* community! For assistance or questions, please contact the Division of Water Resources at lwsp@lists.ncmail.net or (919) 733-4064.