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## **7.0 DROUGHT RESPONSE AND CONTINGENCY PLANS<sup>1</sup>**

The State Water Control Board's Local and Regional Water Supply Planning Regulation includes the following requirements in regard to drought management:

A program that includes community water systems and self-supplied users who withdraw more than an average of 300,000 gallons per month of surface water and groundwater shall contain drought response and contingency plans in accordance with the following requirements:

1. Drought response and contingency plans shall be structured to address the unique characteristics of the water source that is being utilized and the nature of the beneficial use of water.

2. Drought response and contingency plans shall contain, at a minimum, the following three graduated stages of responses to the onset of drought conditions:

a. Drought watch stage responses are generally responses that are intended to increase awareness in the public and private sector to climatic conditions that are likely to precede the occurrence of a significant drought event. Public outreach activities shall be identified to inform the population served by a community water system of the potential for drought conditions to intensify and potential water conservation activities that may be utilized.

b. Drought warning stage responses are generally responses that are required when the onset of a significant drought event is imminent. Voluntary water conservation activities shall be identified with the goal of reducing water use by 5-10%.

c. Drought emergency stage responses are generally responses that are required during the height of a significant drought event. Mandatory water conservation activities shall be identified with the goal of reducing water use by 10-15%.

3. Drought response and contingency plans shall include references to local ordinances, if adopted, and procedures for the implementation and enforcement of drought response and contingency plans.

### **7.1 Drought Management in the Potomac River Basin**

The localities in the Potomac River Basin have cooperated in the management of water supply since the 1970's when the Low Flow Allocation Agreement (LFAA) was signed. The LFAA allocates the amount of water each water supplier can withdraw from the Potomac River, the major source of water for the region, when total flow may not be sufficient to meet all needs. The localities adopted the Metropolitan Washington Water Supply Emergency Agreement in

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<sup>1</sup> 9 VAC 25-780-120.

1979 (see Appendix D). The Emergency Agreement provides for interjurisdictional assistance and coordination to conserve water and provide for necessary curtailment of water use during critical water supply situations in the Metropolitan Washington Area. The Emergency Agreement serves to minimize/eliminate the need for the LFAA restrictions.

Additionally, the localities also adopted the Metropolitan Washington Water Supply and Drought Awareness Response Plan (herein referred to as the “Drought Awareness Response Plan”) in June 2000. The Drought Awareness Response Plan is complimentary to the LFAA and the Emergency Agreement.

The Drought Awareness Response Plan relies on carefully considered data from the NOAA climate office and triggers actions that utilities must take to provide consistent information about the drought conditions across the Potomac Basin. In addition, the Drought Awareness Response Plan includes a year-round plan emphasizing wise water use and conservation.

Since 2000, there have been very few instances in which the Drought Awareness Response Plan has triggered a drought “watch”. During the droughts of 2002, 2007 and 2010, a drought watch stage was enacted. There has not been a “warning” or “emergency” since the Drought Awareness and Response Plan was adopted in 2000.

See Table 7-1 for the Metropolitan Washington Water Supply and Drought Awareness Response Plan. See Appendix D for the Metropolitan Washington Water Supply Emergency Agreement which further details the agreement between the governments and agencies to conserve water and provide for necessary curtailment of water use during water shortages.

**Table 7-1: Metropolitan Washington Water Supply and Drought Awareness Response Plan: Potomac River System**

	Normal	Watch	Warning	Emergency
Description	Wise Water Use	Voluntary Water Conservation	Voluntary Water Restrictions	Mandatory Water Restrictions
Audience	Entire Metropolitan Washington Region	Entire Metropolitan Washington Region	Customers of Co-op System, associated local governments, media	Customers of Co-op System, associated local governments, media
Trigger	<ul style="list-style-type: none"> <li>None. Water supply is adequate to meet all demands</li> </ul>	<ul style="list-style-type: none"> <li>NOAA "D1" drought level in Potomac River Basin (adopted on a <i>provisional 2-year basis and will be re-assessed during this time period</i>)</li> </ul>	<ul style="list-style-type: none"> <li>Combined water supply storage at Jennings Randolph and Little Seneca reservoirs drops to 60% of capacity for 5 consecutive days; lifted when combined water storage at reservoirs increases and remains above 60% for a period of 15 days; OR</li> <li>5% Probability of not meeting unrestricted water supply demands over next 1 - 2 months</li> </ul>	<ul style="list-style-type: none"> <li>50% probability of not being able to meet water supply demands over next month</li> </ul>
Actions	<ul style="list-style-type: none"> <li>Year round Water Conservation Program emphasizing "Wise Water Use"</li> <li>Routine reporting:                             <ul style="list-style-type: none"> <li>Annual briefing in May;</li> <li>Monthly Water and Drought Outlooks (June-Oct)</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>Meeting of the Drought Coordination Committee</li> <li>Regional media briefing/media communications;</li> <li><b>Announce voluntary water conservation recommendations</b></li> <li>Detailed water supply and drought status reporting; outline of next steps in plan;</li> <li>Inform public that Potomac River Co-op Water Supply is adequate to meet unrestricted demands</li> <li>Press release upon first water supply release: reporting on a weekly basis thereafter</li> <li>Press release when water</li> </ul>	<ul style="list-style-type: none"> <li>Meeting of the Drought Coordination Committee</li> <li><b>Announcement of voluntary water restrictions</b></li> <li>Regional media briefing on a weekly basis/ongoing media communications</li> </ul>	<ul style="list-style-type: none"> <li>Meeting of the Drought Coordination Committee</li> <li><b>Announcement of mandatory water restrictions</b></li> <li>WAD assigns allocations to Potomac River utilities (per Low Flow Allocation Agreement)</li> <li>Regional press conference on daily basis; ongoing media communications</li> <li>Water supply reporting on a daily basis</li> </ul>

	Normal	Watch	Warning	Emergency
		supply storage at Jennings Randolph and Little Seneca reservoirs drops to 75% of capacity. <ul style="list-style-type: none"> <li>• Press releases/briefings to include voluntary water conservation recommendations</li> </ul>		
Messages	<p><b><u>Wise Water Use Messages:</u></b></p> <ul style="list-style-type: none"> <li>• Wise water use--focus on inside uses: repairing plumbing problems/leaks</li> </ul> <p><b><u>General Information Messages:</u></b></p> <ul style="list-style-type: none"> <li>• Know your water sources and suppliers</li> <li>• Water supply outlook</li> <li>• Regional response to drought (here is how the region is prepared to respond)</li> <li>• Promotion of web site(s)</li> </ul>	<p><b><u>Voluntary Water CONSERVATION Messages:</u></b></p> <ul style="list-style-type: none"> <li>• Emphasis on water conservation outside the home or office</li> <li>• Reminders about year-round wise water uses</li> </ul> <p><b><u>General Information Messages:</u></b></p> <ul style="list-style-type: none"> <li>• Know your water sources and suppliers</li> <li>• Co-op water supply system outlook</li> <li>• Impact on groundwater users, environment, non-co-op water systems, and agriculture</li> <li>• Water supply conditions have deteriorated, but Co-op water supply system still adequate</li> <li>• Reminder that reservoir releases are planned events</li> <li>• Understanding of current water supply and hydrologic and soil moisture conditions</li> <li>• Reminders of the next steps if conditions worsen</li> </ul>	<p><b><u>Voluntary Water RESTRICTIONS Messages:</u></b></p> <ul style="list-style-type: none"> <li>• Public and businesses asked to voluntarily implement water restrictions to help ensure adequate water supply and maintain reservoir levels</li> <li>• Detailed list of voluntary water restrictions issued</li> </ul> <p><b><u>General Information Messages:</u></b></p> <ul style="list-style-type: none"> <li>• Know your water source</li> <li>• Water supply conditions have deteriorated, but Co-op system water supply still adequate</li> <li>• Co-op water supply system outlook</li> <li>• Reminders of the next steps if conditions worsen</li> </ul>	<p><b><u>Mandatory Water RESTRICTIONS Messages:</u></b></p> <ul style="list-style-type: none"> <li>• Public and businesses required to implement water restrictions to maintain water supplies</li> <li>• Detailed list of mandatory reductions issued</li> </ul> <p><b><u>General Information Messages:</u></b></p> <ul style="list-style-type: none"> <li>• Water supply very limited; water use reductions essential</li> <li>• Know your water source</li> <li>• Co-op water supply outlook</li> </ul>

## 7.2 **Arlington County**

### 7.2.1 Public Community Water Systems

Arlington County's drinking water source is the Potomac River. The water is treated at the Dalecarlia Water Treatment Plant by the Washington Aqueduct Division of the Army Corps of Engineers.

The Arlington County Board of Supervisors adopted the Drought Awareness and Response Plan in 2000.

In addition, the County Code (Section 38.1, Articles I, II, III and IV, see Appendix D), includes a "Water Supply Emergency Ordinance" that allows the County Manager to declare a water shortage condition. It is anticipated that this section of the County's water ordinance will be enacted in any situation where the County Manager determines that a water shortage is occurring, or about to occur, in advance of a declaration made by the Metropolitan Washington Council of Governments (COG).

The Drought Awareness and Response Plan meets the intent of the regulation, is structured to address the characteristics of the Potomac River and the nature of the beneficial use; includes three graduated stages of responses; and has been adopted by resolution by Arlington County. In addition, Arlington County's Code adds additional leeway for the County Manager to enact water conservation measures.

### 7.2.2 Private Community Water Systems and Self-Supplied Users

There are no private community water systems or self-supplied users within Arlington County; therefore, there is no need to develop a plan for self-supplied groundwater users during periods of drought.

## 7.3 **Fairfax County**

### 7.3.1 Public Community Water Systems

The two primary sources of drinking water in Fairfax County for those served by Fairfax Water are the Potomac River and the Occoquan Reservoir. Water from these sources is treated and



distributed by one of several service providers within Fairfax County. Fairfax Water is the largest supplier of drinking water in the County; Fairfax Water draws surface water from the Potomac River and the Occoquan Reservoir (which is fed by the Occoquan River). Other water providers are Fairfax City, City of Falls Church, Town of Vienna and Town of Herndon.

In addition, where public water is not available, private wells supply water to more than 15,000 homes and businesses in Fairfax County.

Fairfax County follows the declarations of the Metropolitan Washington Water Supply and Drought Awareness Response Plan; see Table 7-1. In addition, Fairfax County's Code of Ordinances includes language that gives authority for the restriction of water use or the absolute curtailment of water use. (See Appendix D for a copy of the Ordinance). The County's Ordinance includes three stages of drought, penalties, appeals, and termination clauses.

It is anticipated that this section of Fairfax County's water ordinance will be enacted in any situation where the County determines that a water shortage is occurring, or about to occur, in advance of a declaration made by the Metropolitan Washington COG.

The Drought Awareness and Response Plan meets the intent of the regulation, is structured to address the characteristics of the Potomac River and the nature of the beneficial use; includes three graduated stages of responses; and has been adopted by resolution by Fairfax County. In addition, Fairfax County's Code adds additional leeway for the County Manager to enact water conservation.

It is recommended that the monitoring of drought conditions for the self-supplied groundwater users be of an advisory nature only, since it is not practical for the County to monitor or enforce water use restrictions on self-supplied users.

## **7.4 Loudoun County**

### **7.4.1 Public Community Water Systems**

Loudoun Water provides public water service to residents of the unincorporated areas of Loudoun County; primarily to the residents living East of Route 15 to the Fairfax County line, not including the Town of Leesburg or Dulles Airport. Customers in this area receive water that

has been purchased by Loudoun Water from the City of Fairfax and Fairfax Water. The City of Fairfax gets its water from Goose Creek in Ashburn and Fairfax Water obtains its supply from the Potomac River and Occoquan Reservoir. Loudoun Water also operates nine community water systems which rely on groundwater obtained from community wells.

Loudoun Water follows the Metropolitan Washington COG Drought Awareness Response Plan. The Drought Awareness and Response Plan meets the intent of the regulation, is structured to address the characteristics of the Potomac River and the nature of the beneficial use; includes three graduated stages of responses.

Loudoun County's Code of Ordinances includes a chapter entitled "Water Supply Emergency" which further details the County Administrator's actions and responsibilities during a drought watch, warning or emergency (see Appendix D). It is important to note that this ordinance applies only to those areas served by Loudoun Water. As with the localities discussed above, the Loudoun County ordinance would also allow for the County to enter a drought declaration in advance of a declaration made by the Metropolitan Washington Council of Governments, if necessary.

## **7.5 Prince William County**

### **7.5.1 Public Community Water Systems**

The Prince William County Service Authority (PWCSA) provides water that comes from three sources: Lake Manassas, and purchased water from Fairfax Water (Occoquan Reservoir and Potomac River). Treated water from each of these sources flows to customers in three different parts of the PWCSA's service area.

The PWCSA follows the Metropolitan Washington COG Drought Awareness Response Plan. The Drought Awareness and Response Plan meets the intent of the regulation, is structured to address the characteristics of the Potomac River and the nature of the beneficial use; includes three graduated stages of responses.

In addition, the Prince William County Code of Ordinances includes authority for the County Executive to promulgate orders for the restricted use or absolute curtailment of water use during water shortages and water emergencies. The ordinance applies, not only to the systems operated

by the PWCSA and VAWCo, but also, to any "private water supply or distribution system for which any fee or charge is made for such supply or distribution." The county's ordinance includes: three stages of drought, provisions for termination of a drought declaration, penalties and appeals. As with the localities discussed above, the Prince William County ordinance would also allow for the County to enter a drought declaration in advance of a declaration made by the Metropolitan Washington COG, if necessary.

#### 7.5.2 Smaller Community Systems

There are a number of smaller community water systems operated by PWCSA and by others; all rely on groundwater. The Prince William County Ordinance applies to any of these systems where the users pay a fee.

### 7.6 City of Alexandria

#### 7.6.1 Public Community Water Systems

American Water provides water to the City of Alexandria. The City follows the Metropolitan Washington COG Drought Awareness Response Plan. The Drought Awareness and Response Plan meets the intent of the regulation, is structured to address the characteristics of the Potomac River and the nature of the beneficial use; and includes three graduated stages of responses.

The City of Alexandria's Code of Ordinances includes language that gives the City Manager the authority to declare either a water shortage condition, which includes voluntary water restrictions, or a water supply emergency, which includes mandatory restrictions on water usage. The ordinance provides exemptions for public health, safety and welfare and also includes a provision for which water users may file an appeal with the City Manager's office. Violations of the mandatory water restrictions can result in the charge of a Class Five Civil Violation. The existing ordinance was updated based on recommendations provided in a previous draft version of this report and the updated ordinance was adopted by the City Council on January 21, 2012.

#### 7.6.2 Self-Supplied Users

There are no self-supplied users within the City of Alexandria; therefore, there is no need to develop a plan for self-supplied groundwater users during periods of drought.

## **7.7 City of Fairfax**

### **7.7.1 Public Community Water Systems**

While the City of Fairfax obtains its water from a supply that is independent of the Potomac River, it follows the Metropolitan Washington COG Drought Awareness Response Plan. The Drought Awareness and Response Plan meets the intent of the regulation.

In addition, the City's Code of Ordinances includes language that gives the city manager authority to declare water shortage restrictions. The ordinance includes three stages of voluntary restrictions plus a mandatory stage. The ordinance includes requirements for waivers of restrictions, provisions for termination of the restrictions, appeals, and penalties.

It is anticipated that the City's water ordinance will be enacted in any situation where the City determines that a water shortage is occurring, or about to occur, in advance of a declaration made by the Metropolitan Washington COG.

### **7.7.2 Self-Supplied Users**

There are no self-supplied users within the City of Fairfax; therefore, there is no need to develop a plan for self-supplied groundwater users during periods of drought.

## **7.8 City of Falls Church**

### **7.8.1 Public Community Water Systems**

The City of Falls Church purchases water from the Washington Aqueduct and follows the Metropolitan Washington COG Drought Awareness Response Plan. The Drought Awareness and Response Plan meets the intent of the regulation, is structured to address the characteristics of the Potomac River and the nature of the beneficial use; and includes three graduated stages of responses.

In addition, the City's Code of Ordinances includes language that gives the city manager authority to declare water shortage restrictions following declaration of restrictions WCOG in accordance with the Metropolitan Washington Water Supply and Drought Awareness Response Plan.

The city ordinance relies on the stages of the regional drought plan; includes penalties, appeals and some exceptions to the ordinance.

#### 7.8.2 Self-Supplied Users

There are no self-supplied users within the City of Falls Church; therefore, there is no need to develop a plan for self-supplied groundwater users during periods of drought.

### 7.9 **City of Manassas**

#### 7.9.1 Public Community Water Systems

The City of Manassas uses water from Lake Manassas and can purchase water from the PWCSA, but usually does not. The City is a partner to the Metropolitan Washington COG Drought Awareness Response Plan and follows the plan. The Drought Awareness and Response Plan meets the intent of the regulation, is structured to address the characteristics of the Potomac River and the nature of the beneficial use; and includes three graduated stages of responses.

In addition, the City's Code of Ordinances includes language that gives the city council the authority to declare a drought (see Appendix D). The ordinance includes four stages of drought (watch, warning, drought emergency and critical emergency), refers to the city's drought contingency plan, and includes excessive use surcharges, appeals and exemptions.

#### 7.9.2 Self-Supplied Users

There are no self-supplied users within the City of Manassas; therefore, there is no need to develop a plan for self-supplied groundwater users during periods of drought.

### 7.10 **City of Manassas Park**

#### 7.10.1 Public Community Water Systems

The City of Manassas Park relies on groundwater, the PWCSA and the City of Manassas for water. As a result, the City follows the Metropolitan Washington COG Drought Awareness Response Plan. The Drought Awareness and Response Plan meets the intent of the regulation, is structured to address the characteristics of the Potomac River and the nature of the beneficial use; and includes three graduated stages of responses.

In addition, the City’s Code of Ordinances includes language that gives the city manager the authority to declare a drought (see Appendix D). The ordinance includes three stages of drought, includes a list of restricted uses, and includes penalties and appeals.

Since there is one system that relies on groundwater, it is recommended that the City develop a plan that incorporates the monitoring of precipitation and groundwater levels to provide information relevant to this groundwater system (see Section 7.24 below).

#### 7.10.2 Self-Supplied Users

There are no self-supplied users within the City of Manassas Park; therefore, there is no need to develop a plan for self-supplied groundwater users during periods of drought.

### 7.11 **Town of Clifton**

The Town of Clifton is located in Fairfax County. There is no community water system serving the town; all homes and non-residential users are self-supplied and rely on wells. The Town of Clifton has indicated they will follow any drought-related restrictions imposed by Prince William County and/or the PWCSA.

### 7.12 **Town of Dumfries**

#### 7.12.1 Public Community Water Systems

The PWCSA owns and operates the water system serving the Town of Dumfries. As a result, the users in the town follow any drought-related restrictions imposed by the PWCSA.

### 7.13 **Town of Hamilton**

#### 7.13.1 Public Community Water Systems

The Town of Hamilton relies on groundwater. The Town’s ordinance addresses conservation through voluntary and mandatory restrictions and relies on the NOAA Drought Index and certain system operations parameters to establish the stages of drought. The ordinance includes penalties and waivers, provides authorization for Town Council to implement any of the stages of drought, and allows the mayor to declare a “water shortage emergency.”

It is recommended that the Town consider including the monitoring of groundwater levels in addition to precipitation as outlined in Section 7.24 below.

### 7.13.2 Self-Supplied Users

There are no self-supplied users within the Town of Hamilton; therefore, there is no need to develop a plan for self-supplied groundwater users during periods of drought.

## 7.14 **Town of Haymarket**

### 7.14.1 Public Community Water Systems

The PWCSA owns and operates the water system serving the Town of Haymarket. As a result, the users in the town follow any drought-related restrictions imposed by the PWCSA.

## 7.15 **Town of Herndon**

### 7.15.1 Public Community Water Systems

The Town of Herndon purchases water from Fairfax Water and follows the Metropolitan Washington COG Drought Awareness Response Plan. The Drought Awareness and Response Plan meets the intent of the regulation, is structured to address the characteristics of the Potomac River and the nature of the beneficial use; and includes three graduated stages of responses.

The Town's Code of Ordinances authorizes the Town Manager to implement immediate restrictions on use when there is an emergency (generally related to operational or system failures) and gives the Town Manager the authority to restrict use when water shortages have reached dangerous or critical levels. The ordinance also includes penalties.

Since the Town follows the Drought Awareness Response Plan, and the Town Ordinance gives the Town Manager additional leeway to require restrictions in use for situations not addressed by the Drought Awareness Response Plan, therefore, it appears the existing practices in Herndon are adequate to meet the intent of the regulation.

### 7.15.2 Self-Supplied Users

There are no self-supplied users within the Town of Herndon; therefore, there is no need to develop a plan for self-supplied groundwater users during periods of drought.

## **7.16 Town of Leesburg**

### **7.16.1 Public Community Water Systems**

The Town of Leesburg owns and operates the Kenneth B. Rollins Memorial Water Filtration Plant, which withdraws water from the Potomac River. Leesburg also has a groundwater supply that consists of the Paxton Well. The Paxton Well is primarily used during low flow demand periods (night time) and generally serves only the northeast region of the main zone. Approximately 98% of the drinking water is produced at the water filtration plant using surface water, and 2% is produced by the Paxton Well using groundwater.

The Town of Leesburg follows the Metropolitan Washington COG Drought Awareness Response Plan. The Drought Awareness and Response Plan meets the intent of the regulation, is structured to address the characteristics of the Potomac River and the nature of the beneficial use; includes three graduated stages of responses.

Leesburg's water ordinance references and incorporates the Metropolitan Washington Drought Awareness Response Plan; therefore it appears the existing practices in Leesburg are adequate to meet the intent of the regulation.

### **7.16.2 Self-Supplied Users**

There are no self-supplied users within the Town of Leesburg; therefore, there is no need to develop a plan for self-supplied groundwater users during periods of drought.

## **7.17 Town of Lovettsville**

### **7.17.1 Public Community Water Systems**

The Town of Lovettsville relies on groundwater. The Town's ordinance addresses conservation through voluntary and mandatory restrictions and relies on the NOAA Drought Index and system operations parameters to establish the stages of drought.

### **7.17.2 Self-Supplied Users**

There are no self-supplied users within the Town of Lovettsville; therefore, there is no need to develop a plan for self-supplied groundwater users during periods of drought.



## 7.18 **Town of Middleburg**

### 7.18.1 Public Community Water Systems

The Town of Middleburg’s municipal water system relies on groundwater. The Town Water Ordinance (see Appendix D). includes language stating that Council “may impose water conservation measures to reduce the danger to the town’s water supply and distribution system ...” The ordinance basically prohibits outside use of water for watering plants unless a container is being used for watering.

It is recommended that the Town of Middleburg review the proposed drought plan outlined in Section 7.24 and consider adopting this plan, or some variation of the plan and an ordinance to implement the plan.

### 7.18.2 Self-Supplied Users

There are no self-supplied users within the Town of Middleburg; therefore, there is no need to develop a plan for self-supplied groundwater users during periods of drought.

## 7.19 **Town of Occoquan**

### 7.19.1 Public Community Water Systems

The PWCSA owns and operates the water system serving the Town of Occoquan. As a result, the users in the town follow any drought-related restrictions imposed by the PWCSA.

### 7.19.2 Self-Supplied Users

There are no self-supplied users within the Town of Occoquan; therefore, there is no need to develop a plan for self-supplied groundwater users during periods of drought.

## 7.20 **Town of Purcellville**

### 7.20.1 Public Community Water Systems

The Town of Purcellville municipal system relies on surface water from the Hirst Reservoir and the Cooper Springs Impoundment. The Town has developed a Water Conservation and Curtailment Plan and a “water emergency ordinance” (see Appendix D).

The Water Conservation and Curtailment Plan addresses a variety of actions designed to reduce water demands on a daily basis. In addition, the Drought Response and Contingency Plan and related ordinance were developed in response to the SWCB Water Supply Planning Regulation.

The Ordinance includes four stages (normal, watch, warning, and emergency) and the determination of the levels is based on review of the NOAA Drought Index, the level of water in the Hirst Reservoir, the current demands, and the operation of the system. The ordinance includes wise water use, voluntary water conservations actions, and mandatory restrictions. The Ordinance also includes waivers and penalties.

It appears that the existing Water Conservation and Curtailment Plan meets the needs of the Town and meets the requirements of the SWCB Water Supply Planning Regulation.

#### 7.20.2 Self-Supplied Users

There are no self-supplied users within the Town of Purcellville; therefore, there is no need to develop a plan for self-supplied groundwater users during periods of drought.

### 7.21 **Town of Quantico**

The Town of Quantico purchases water from the Quantico Marine Corps Base and the source is a surface water reservoir.

No additional information is available at this time.

### 7.22 **Town of Round Hill**

#### 7.22.1 Public Community Water Systems

The Town of Round Hill is a groundwater system. The existing water conservation ordinance includes voluntary and mandatory conservation measures. The ordinance does not rely on “triggers” as suggested by the SWCB regulation.

It is recommended that the Town of Round Hill consider implementation of a drought plan that incorporates the “triggers” as outlined in Section 7.24.

### 7.22.2 Self-Supplied Users

There are no self-supplied users within the Town of Round Hill; therefore, there is no need to develop a plan for self-supplied groundwater users during periods of drought.

### 7.23 **Town of Vienna**

The City of Falls Church provides water to the Town of Vienna municipal water system. In May 1977, the Town adopted a “Water Shortage Control Plan” (see Appendix D) which calls for restricted use or curtailment of use in the Town when the City of Falls Church notifies the Town that the “Emergency” stage of the Falls Church Emergency Plan has been declared.

It is recommended that the Town of Vienna adopt a drought plan that follows the Metropolitan Washington Water Supply and Drought Awareness Response Plan (see Table 7-1) and the Metropolitan Washington Water Supply Emergency Agreement in 1979 (see Appendix D). In addition, it is recommended that the Town of Vienna amend its ordinance to reference the Drought Awareness Response Plan.

### 7.24 **Drought Monitoring for Town Community Water Systems that rely on Groundwater**

The Town of Hamilton, the Town of Lovettsville, the Town of Middleburg, the Town of Round Hill, and the Town of Vienna (herein after, the “Towns”) own and operate community water systems that rely on groundwater. In addition, the PWCSA owns and operates three community water systems that rely on groundwater and Loudoun Water operates six community systems that rely on groundwater.

The purpose of this Drought Response and Contingency Plan is to establish actions and procedures for those systems that rely on groundwater and to provide a framework for managing water demand and evaluating supply options during periods of drought or other water supply emergency.

The following provides indicators that can be monitored by each water provider listed above. Additionally, listed below are recommended procedures for enacting voluntary or mandatory restrictions in use, and penalties for non-compliance. A sample ordinance is included in Appendix D.

#### 7.24.1 Overall Water Use Policy

The Drought Response Plan is part of an overall water use policy that emphasizes the efficient use of water at all times, not just during drought. Overall water conservation efforts include:

- ◆ **Water Efficiency:** Encourage ongoing water demand management, water use efficiency and water conservation activities by all users of groundwater by increasing public education efforts.
- ◆ **Public Education and Outreach:** Increase drought awareness by increasing public education efforts.

#### 7.24.2 Drought Monitoring

This plan includes a monitoring framework that relies upon the monitoring of drought indicators to determine drought stages and resulting actions to be taken by users of the Town's community water system.

The Towns will monitor the development of drought conditions in the Northern Virginia region using the drought indicators described herein in order to determine when conditions warrant a drought stage declaration for the community water systems that rely on groundwater.

#### 7.24.3 Local Drought Indicators

In order to monitor potential drought conditions, the Towns will use two indicators to evaluate drought severity. These indicators include precipitation and groundwater levels. Both indicators are discussed below. In addition, in the event that the Water System Operator indicates that the water demands exceed the capacity of the system to produce, treat, store or distribute water, conservation measures should be considered.

#### 7.24.4 Precipitation Deficits

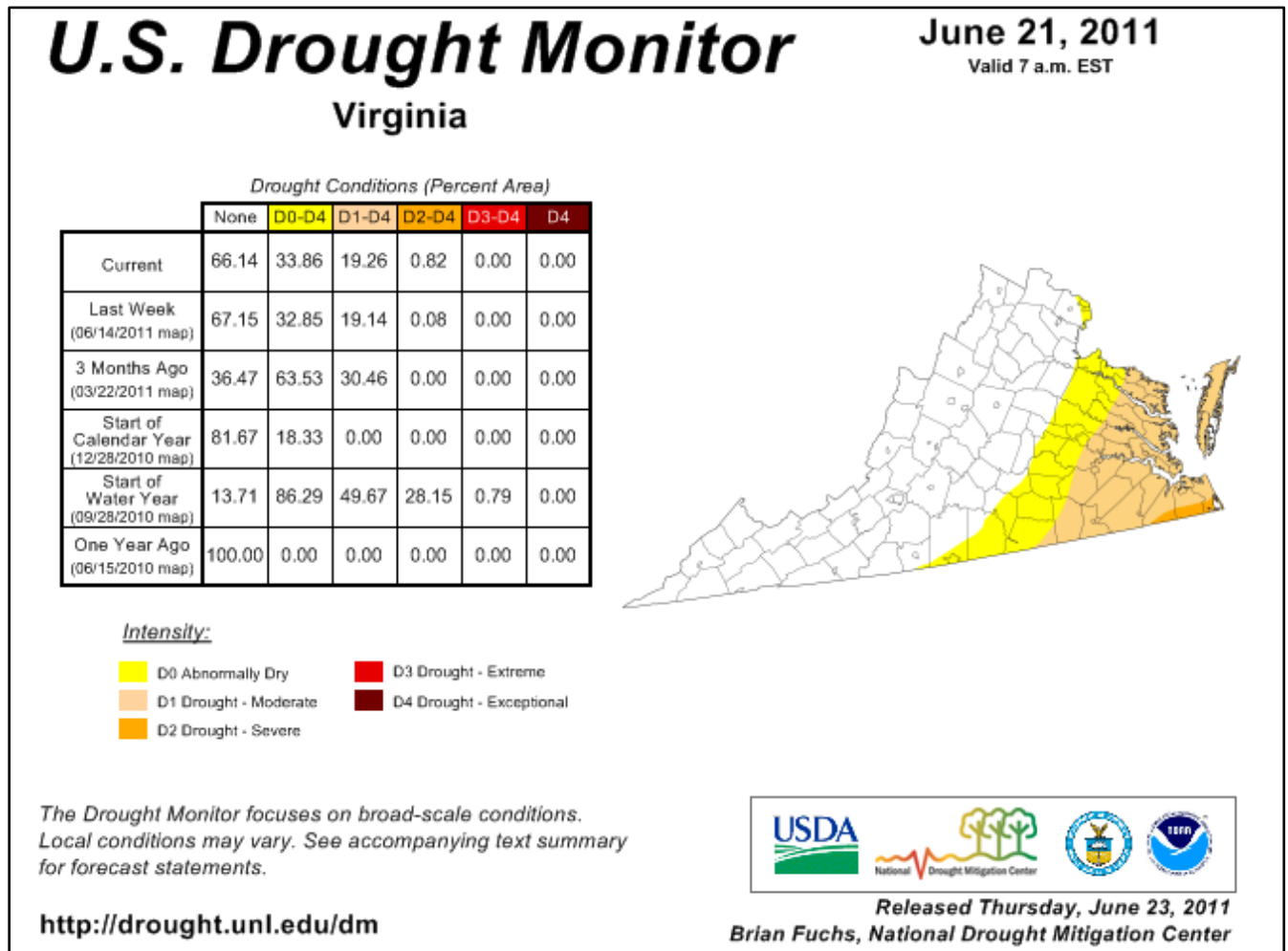
Precipitation deficits will be monitored by comparing current precipitation amounts with historical precipitation values as a percent of normal long-term average values.

Precipitation deficits can be assessed by accessing the U.S. Drought Monitor for Virginia. The map is updated each week and can be found on VDEQ's website<sup>2</sup>. As shown below, the map and related key provides easy-to-understand information.

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<sup>2</sup><http://www.deq.virginia.gov/waterresources/drought.php>

Figure 7-1: U.S. Drought Monitor



### 7.24.5 Groundwater Levels

There are four USGS observation wells in the Northern Virginia Region as detailed below.

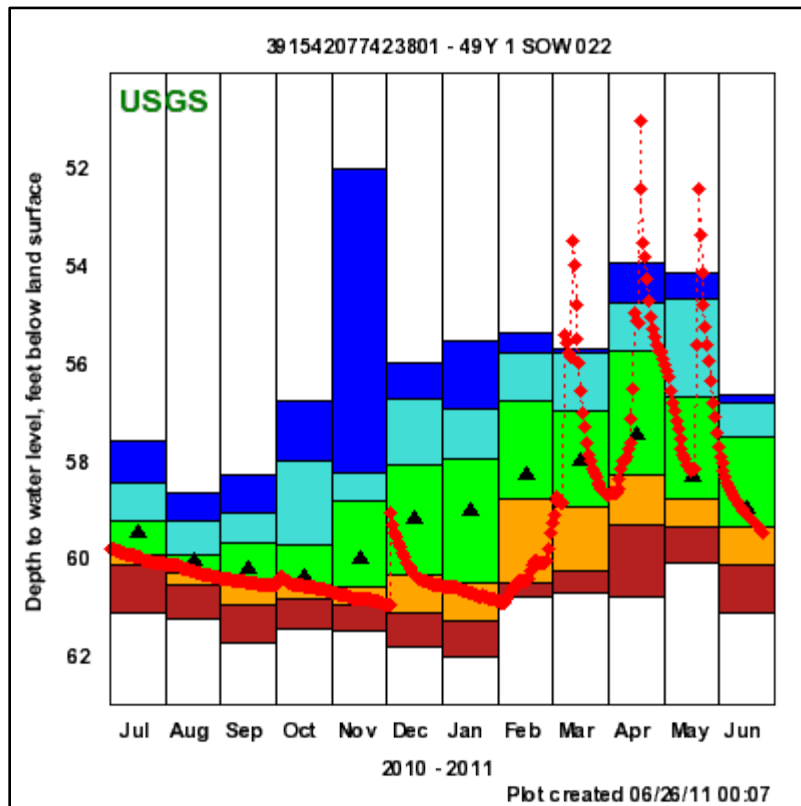
**Table 7-2: Observation Wells in Northern Virginia Region**

Locality	Site ID / Site Name	National Aquifer	Local Aquifer	Depth of Well
Loudoun County	391542077423801 - 49Y 1 SOW 022	Piedmont and Blue Ridge Crystalline-Rock Aquifer	Precambrian Eratham	516 ft.
Fairfax County	385638077220101 - 52V 2D	Manassas Sandstone of Triassic Age		205 ft.
Prince William County	385607077381101 - 49V 1	Turkey Run formation or Early Jurassic age.		165 ft.
Prince William County	383423077245901 - 51S 7	Lunga Reservoir Formation of Cambrian age. Depth 490 ft.		490 ft.

The wells will be used as an indicator of groundwater response to drought.

The following figures show examples of the information that is provided by USGS and available on VDEQ's website<sup>3</sup>.

**Figure 7-2: Loudoun County Well - 49Y 1 SOW 022**



<sup>3</sup><http://www.deq.virginia.gov/waterresources/drought.php>











On June 26, 2011, the depth to water level for this well was 59.57 feet below ground surface (see Figure 7-2). As shown below, that reading falls between the 10<sup>th</sup> and 25<sup>th</sup> percentile when compared to the median readings for the month of May over the past 30 or more years.

**Table 7-3: Historical Data from Loudoun County Well – 49Y 1 SOW022**

Month	Lowest Median	10th %ile	25th %ile	50th %ile	75th %ile	90th %ile	Highest Median	Number of Years
Jan	61.97	61.24	60.46	58.98	57.93	56.92	55.51	33
Feb	60.74	60.46	58.74	58.26	56.75	55.78	55.37	30
Mar	60.68	60.22	58.93	57.97	56.96	55.78	55.68	26
Apr	60.75	59.27	58.25	57.44	55.71	54.74	53.94	29
May	60.07	59.33	58.74	58.30	56.66	54.65	54.14	32
Jun	61.10	60.11	59.32	58.96	57.50	56.78	56.63	24
Jul	61.10	60.11	59.91	59.46	59.19	58.43	57.55	30
Aug	61.20	60.52	60.25	60.04	59.88	59.21	58.64	35
Sep	61.70	60.94	60.41	60.18	59.66	59.03	58.26	24
Oct	61.40	60.79	60.53	60.35	59.68	57.99	56.75	32
Nov	61.47	60.93	60.57	59.98	58.79	58.22	52.00	29
Dec	61.80	61.10	60.29	59.15	58.07	56.69	55.98	25

The USGS Groundwater Watch data includes the following table which provides an indication of the status of the most recent reading. As shown below, a reading between the 10<sup>th</sup> and 25<sup>th</sup> percentile is considered “below normal”.

**Figure 7-3: Explanation of Percentile Classes**

Explanation - Percentile classes (symbol color based on most recent daily value.)									
									
New Low	<5	5-10	10-24	25-75	76-90	90-95	>95	New High	Not Ranked
	Well Below Normal		Below Normal	Normal	Above Normal	Well Above Normal			

The following tables outlines the drought responses based on groundwater levels.

**Table 7-4: Drought Stages Based on Groundwater Levels**

Drought Stage	Criteria
Watch	Measured groundwater level between the 10 <sup>th</sup> and 24 <sup>th</sup> percentile for all historic levels.
Warning	Measured groundwater level between the 5 <sup>th</sup> and 10 <sup>th</sup> percentile for all historic levels
Emergency	Measured groundwater level less than the 5 <sup>th</sup> percentile for all historic levels.



Measured groundwater level above the 25th percentile for all historic levels will be defined as normal conditions. Measured groundwater level between the 10th and 24th percentiles for all historic levels will be defined as drought watch conditions. Measured groundwater level between the 5th and 10th percentile for all historic levels will be defined as drought warning conditions. Measured groundwater level below the 5th percentile for all historic levels will be defined as drought emergency conditions.

#### 7.24.6 Other Indicators

Each Town will also consider recommendations from the Water System Operator concerning implementing voluntary or mandatory water use restrictions at any time that the water demands exceeds the capacity of the system to produce, treat, store or distribute water.

Each Town may evaluate other available drought information during deliberations related to the development of drought stage recommendations. Other drought indicators that may be considered include the Standardized Precipitation Index, Palmer Drought Severity Index, Crop Moisture Index, NOAA monthly and seasonal precipitation outlooks. Also, antecedent effective ground-water recharge rates, as estimated from hydrograph separation techniques, will be considered.

#### 7.24.7 Declaration of Drought

The Town Council will use the following general descriptions of three drought stages when determining drought declarations. *These descriptions should not be viewed as absolute requirements for drought designation, but as a mechanism to be used to reach the appropriate drought advisement.* The specific response activities that are delineated below for the three drought stages should be viewed as activities that should be initiated in response to a drought stage declaration.

#### 7.24.8 Declaration of Drought by Governor or Virginia Drought Coordinator

In the event that the Governor or the Virginia Drought Coordinator declares a drought emergency in a region that includes any of the Towns, the mandatory conservation measures detailed below will be implemented upon the drought declaration, unless the governor's restrictions are more restrictive, or unless local conditions differ.

#### 7.24.9 Drought Stages

There are three drought stages that are governed by precipitation levels, groundwater levels and system operations, as defined by each water system. These drought stages include drought watch, drought warning, and drought emergency. If the existing conditions meet the criteria for a drought stage to be declared, the Town Council will consider declaration of the stage.

#### 7.24.10 Drought Watch

The drought watch stage is intended to increase public awareness of climatic conditions that are likely to precede the occurrence of a significant drought event. When a drought watch is warranted, the Town Council will consider the declaration of a drought watch. The Town Council will call upon the town's water customers to employ prudent restraint in water usage, and to conserve water voluntarily. A list of suggested voluntary conservation efforts is included below.

It is unlikely that significant water use reductions will occur at this stage although it is possible that the increased public awareness of water conservation activities may reduce water use up to 5%.

#### 7.24.11 Drought Warning

When a drought warning is warranted in accordance with this Plan, the Town Council shall consider the declaration of a drought warning. In this stage, the public is asked to curtail non-essential usages of water. See below for a list of nonessential uses that should be curtailed during a drought warning.

Water conservation activities at this stage would be voluntary. Voluntary water conservation activities generally result in reductions in water use of 5-10%. Additionally, in this stage all water users would be encouraged to spread out water use throughout the day and across days of the week.

#### 7.24.12 Drought Emergency

Town Council shall consider declaration of a drought emergency should the conditions that warrant a drought emergency be present.

When a drought emergency is warranted in accordance with the Drought Response and Contingency Plan, water use shall be restricted to purposes which are absolutely essential to life, health and safety. All nonessential uses of water should be eliminated. During these times, it is likely that some water supplies will not provide the quantity of water needed by all users.

Mandatory water conservation activities usually result in water use reductions of 10-15%.

#### 7.24.13 Enforcement

There are two sections of the Code of Virginia that give governing bodies the authority to restrict the use of water: Section § 15.2-923 pertains to the nonessential use of groundwater and Section § 15.2-924 provides the authority to restrict the use of water during a water supply emergency.

The sections of the Code are as follows:

##### § 15.2-923. Local water-saving ordinances:

Notwithstanding any contrary provision of law, as shall be necessary to protect the public health, safety and welfare, any locality may by ordinance (i) require the installation of water conservation devices in the case of the retrofitting of buildings constructed prior to July 1, 1978, and (ii) restrict the nonessential use of groundwater during declared water shortages or water emergencies.

For purposes of this section "nonessential use" shall not include agricultural use.

##### § 15.2-924. Water supply emergency ordinances.

- A. Whenever the governing body of any locality finds that a water supply emergency exists or is reasonably likely to occur if water conservation measures are not taken, it may adopt an ordinance restricting the use of water by the citizens of such locality for the duration of such emergency or for a period of time necessary to prevent the occurrence of a water supply emergency. However, such ordinance shall apply only to water supplied by a locality, authority, or company distributing water for a fee or charge. Such ordinance may include appropriate penalties designed to prevent excessive use of water, including, but not limited to, a surcharge on excessive amounts used.

#### 7.24.14 Governmental Actions in Response to Drought Stages

In each Town, the Water System Operator will be responsible for monitoring precipitation and groundwater levels and making periodic reports to the Town Manager or Town Council. At any time that the indicators warrant the declaration of a drought watch, warning or emergency, the Water System Operator shall promptly advise the Town Manager or the Town Council. Further, the declaration and the related water use restrictions, if any, shall be posted by the Town on the town website, made available to the media outlets and made available to the general public.

7.24.14.1. Normal Conditions

None of the indicators are outside of the normal range.

- ◆ Precipitation exceeds the percent of normal precipitation for the time period in precipitation table.
- ◆ Groundwater levels are above the 25<sup>th</sup> percentile for all historic levels.
- ◆ There are no general operational or system failures.

7.24.14.2. Normal Conditions – Action to be Taken

None.

7.24.14.3. Drought Watch

At least one of the indicators meets the following conditions:

- ◆ Precipitation levels are at or below the percent of normal precipitation for the time period in precipitation table.
- ◆ Groundwater levels fall between the 10th and 24th percentile for all historic levels.
- ◆ Or, the Water System Operator recommends that voluntary conservation measures be implemented.

7.24.14.4. Drought Watch - Action to be Taken

Town Council is advised to declare a Drought Watch.

- ◆ Town Council will issue a press release indicating the reasons for the declaration and will make periodic reports of drought conditions available to media outlets.
- ◆ All town water users will be asked to begin voluntary water conservation.
- ◆ Water System Operator will continue to monitor regional moisture conditions and provide periodic reports of drought conditions to the Town Council or Town Manager.

7.24.14.5. Voluntary Water Conservation Measures during a Drought Watch

During a drought watch stage, responses to drought are voluntary. Upon the declaration of voluntary water conservation measures, the Town’s water users are requested to voluntarily limit their use of water as follows:

**Table 7-5: Voluntary Water Conservation Measures – Drought Watch**

<b>Category</b>	<b>Voluntary Conservation Measure</b>
Businesses	Conservation by any means is encouraged.
Restaurants	Conservation by any means is encouraged.
All other Consumption, including Residential	Conservation by any means is encouraged.

7.24.14.6. Drought Warning

Two or more of the indicators meet the following conditions:

- ◆ Precipitation levels are at or below the percent of normal precipitation for the time period in precipitation table.
- ◆ Measured groundwater levels fall below the 25th percentile for all historic levels.
- ◆ Or, the Water System Operator recommends that voluntary conservation measures be implemented.

7.24.14.7. Drought Warning - Action to be Taken

- ◆ Water System Operator will advise the Town Council regarding the declaration of a Drought Warning.
- ◆ Council will issue a press release indicating the reasons for the declaration and will make reports of drought conditions available to media outlets.
- ◆ Water System Operator will continue to monitor regional moisture conditions and provide periodic reports of drought conditions to the Town Council or Town Manager.
- ◆ All town government offices will initiate the reduction or elimination of nonessential uses of water with the goal of reducing total water usage by

5-10%.

7.24.14.8. Voluntary Water Conservation Measures During a Drought Warning

During a drought warning stage, responses to drought are voluntary. Upon the declaration of voluntary water conservation measures, the public is requested to voluntarily limit their use of water as follows:

**Table 7-6: Voluntary Water Conservation Measures – Drought Warning**

<b>Category</b>	<b>Voluntary Conservation Measure</b>
Businesses	Conservation by any means encouraged.
Restaurants	Conservation by any means encouraged.
All other Consumption, including Residential	Conservation by any means encouraged.
Paved Areas	Washing is discouraged, except for immediate health and safety requirements
Swimming Pools	Limit to filling and replenishing to maintain health and safety.
Vehicle Washing	Non-commercial washing is limited to one day per week using only hoses with an automatic shut-off nozzle. Commercial vehicle washing businesses are permitted to operate under normal conditions.
Landscaping	Limit watering with an irrigation system or with a hose to one day per week. Watering with buckets is unrestricted.
Vegetable Gardens	Limit watering to any two days per week and from 8:00 p.m. to 10:00 a.m. on any day. Watering by bucket is unrestricted.

7.24.14.9. Drought Emergency

All three indicators meet the following conditions:

- ◆ Precipitation levels are at or below the percent of normal precipitation for the time period in the precipitation table.
- ◆ Measured groundwater levels fall to or below the 5th percentile for all historic levels.
- ◆ Or, the Water System Operator recommends that mandatory conservation measures be implemented.

7.24.14.10. Drought Emergency - Action to be Taken

- ◆ Town Council or Town Manager will issue a press release indicating the reasons

for the declaration and will make reports of drought conditions available to media outlets.

- ◆ Water System Operator will continue to monitor regional moisture conditions and groundwater levels and will provide periodic reports of drought conditions to the Town Manager or Town Council.

7.24.14.11. Response to Drought

During a Drought Emergency, the following water use restrictions shall not apply to the agricultural production of food or fiber, the maintenance of livestock including poultry, nor the commercial production of plant materials so long as best management practices are applied to assure the minimum amount of water is utilized.

**Table 7-7: Emergency Water Restrictions**

<b>Category</b>	<b>Emergency Conservation Measures</b>
Businesses	Limit water usage to those essential for business and human hygiene.
Restaurants	Water use only for cooking, hygiene and meal beverage.
All other Consumption, including Residential	Limit water to essential use only.
Decorative or Landscape Fountains	All water use is prohibited.
Paved Areas	All water use is prohibited.
Swimming Pools	All water use is prohibited.
Vehicle Washing (Except for commercial vehicle washing businesses that use recycled water)	All water use is prohibited.
Landscaping and Gardens	All water use is prohibited.
Vegetable Gardens	All water use is prohibited.
Golf Courses and Athletic Fields	All water use for irrigation is prohibited.

7.24.15 Enforcement of Mandatory Restrictions

Any person who violates or fails to comply with the mandatory conservation restrictions after a public notice has been issued shall be subject to the following penalties:

- ◆ For the first offense, violators shall receive a written warning delivered in person or posted by a representative of the Town.
- ◆ For the second offense, violators shall be fined \$100.00,
- ◆ For the third and each subsequent offense, violators shall be fined \$200.00 for each offense; and

- ◆ Each violation by a person shall be counted as a separate violation by that person, irrespective of the location at which the violation occurs.

Persons who have been assessed a penalty shall have the right to challenge the assessment by providing a written notice to the Town Office within 10 days of the assessment date. The Town Manager, Mayor, or his designee, shall determine whether the penalty was properly assessed and notify the complaining person in writing of his determination. The Town Manager, Mayor, or his designee, has the right to waive the penalty if he determines that the violation occurred due to no fault of the person.

#### **7.25 Drought Monitoring for Prince William County SA Community Water Systems that rely on Groundwater**

It is recommended that the PWCSA monitor groundwater levels, precipitation and system operations as outlined in section 7.24 to determine when users of the PWCSA systems that rely on groundwater should participate in voluntary or mandatory conservation.

It is recommended that the General Manager of the PWCSA monitor the conditions outlined above and, determine when a drought watch, warning or emergency is warranted. Upon declaration of a drought stage, public information will be posted on the Service Authority's website and made available to local media outlets.

#### **7.26 Drought Monitoring for Self-Supplied Users in Fairfax County, Loudoun County and Prince William County**

It is recommended that Loudoun County, Prince William County and Fairfax County monitor the drought indicators discussed in Section 7.24 and, in addition, monitor the incidence of reports of wells that have "gone dry" in the jurisdiction.

The purpose of monitoring this information is to provide information to self-supplied users when a drought is occurring or about to occur which may impact the operation of wells and reduce the availability of groundwater.