City of Portsmouth

Department of Public Works

October 6, 2017

Portsmouth Water Supply Status Report

Overview

The following Portsmouth Water Supply Status Report provides the Portsmouth Water customers an assessment of the current water supply conditions. This report is distributed routinely via the City of Portsmouth's website at: www.Cityofportsmouth.com/publicworks - water

Water Use Restrictions

Customer Water Restrictions
N/A
None
Voluntary Measures
Odd/Even Watering
Two-Days per Week Watering
No Lawn Watering

There are **no water use restrictions** at this time. The total precipitation over past three months was 3.30 inches below normal for this time of year, however, the past twelve months yielded an amount equivalent to the 30-year average. Groundwater levels, reservoir levels and river flow rates are within typical ranges for this time of year.

We continue to ask our water customers to please use water wisely, minimize waste, and incorporate water efficient fixtures and appliances whenever possible. In an effort to support this goal, the City offers all residential water customers rebates for the installation of low-flow toilets and high-efficiency washing machines. More details can be found in the Public Works Billing Information section of the City's website.

Additional updates and tips regarding water efficiency can be accessed at the **cityofportsmouth.com**.

Water operations staff continue to assess the supply conditions and will provide updates at least monthly.

Current Customer Water Demand

Current Water Demand
Below Normal
Normal
Above Normal
High
Very High
Historic High

Water demand is **Below Normal** at this time.

Slightly cooler than average daily temperatures in September have contributed to the lower demands in September than in typical years. Additionally, water efficiency efforts by the City and water system customers is decreasing the daily demand for indoor water use throughout the water system.

Water Demand is a factor in the supply status assessment that is measured by the amount of water delivered through the water system. This factor reflects customer usage and variations caused by daily, weekly and seasonal changes in business, residential and irrigation demands. Average daily water demand was 4.45 million gallons per day (MGD) in September 2017, which is 9.6% below the 10-year normal for this time of year.

Month	Monthly Demand (Million Gallons per Day (MGD))	Historic Average Demand (ten-year average (MGD))
September 2016	4.47	4.96
October 2016	4.02	4.23
November 2016	3.59	4.01
December 2016	3.72	3.93
January 2017	3.69	4.11
February 2017	3.54	4.20
March 2017	3.68	4.18
April 2017	4.01	4.14
May 2017	4.14	4.73
June 2017	4.83	5.15
July 2017	5.15	5.46
August 2017	5.34	5.43
September 2017	4.45	4.92

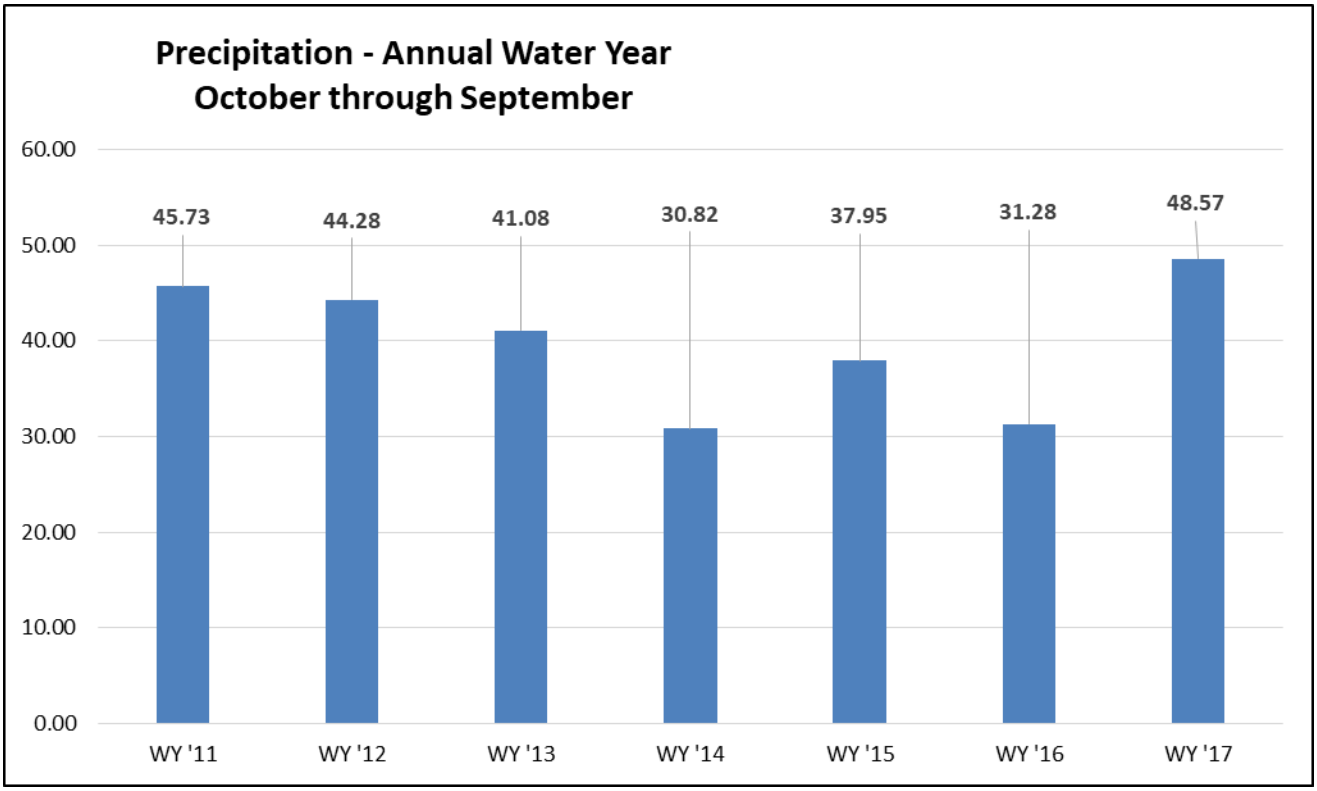
Precipitation Status

Precipitation
Above Average
Average
Below Average
Dry
Very Dry
Drought

Total September precipitation in Portsmouth was 3.39 inches. This is 0.81 inches less than normal for the month. Over the past three months there has been 7.88 inches of precipitation which is 30% less than the normal precipitation over this period. Four storm events, each yielding from 0.18 to 1.93 inches, occurred in September.

Total precipitation over a rolling 12-month period is compared to the mean annual precipitation of 47.20 inches. Precipitation over the past 12-months, which is considered the water year, October through September, totaled 48.57 inches.

The U.S.Geological Survey defines a "water year" as the 12-month period October 1, for any given year through September 30, of the following year. October is generally the end of a growing season and is a time when precipitation can replenish surface and groundwater supplies. The following graphic shows the total precipitation tracked by our water system over the past seven years. The good news is that this has been the wettest water year since 2010. It also highlights how dry the previous four years have been. They were all significantly below normal than average, especially last year, which was 17 inches below normal.



Groundwater Levels

Groundwater Levels
Above Average
Average
Below Average
Low
Very Low
Drought

Currently the groundwater levels are considered **Above Average.** Groundwater levels in the four aquifers used for the Portsmouth water supply are higher than typically occur during this time of year. This is attributed to the wetter conditions experienced this year but also due to the operating parameters that water system operators are following whereby we utilize as much surface water as possible during wetter periods to rest our groundwater sources and allow them to recover and store water for dry periods.

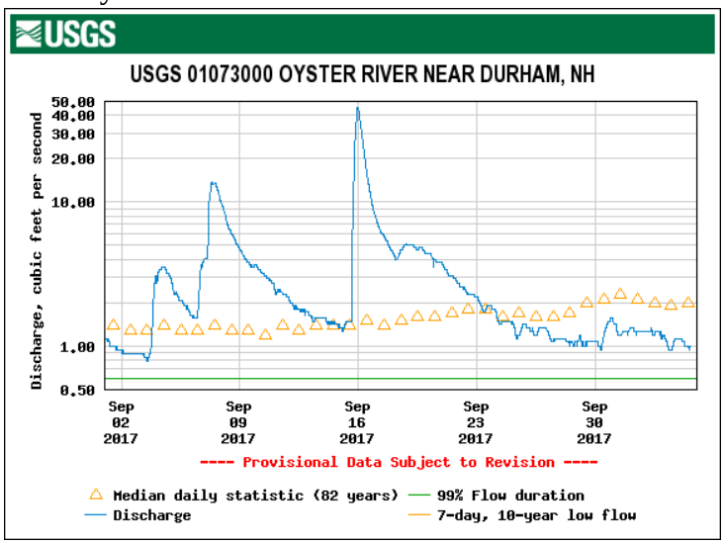
Groundwater from wells in Madbury, Portsmouth and Greenland typically provide between 34% and 45% of the water supply to Portsmouth customers, with the remaining 55% to 66% from the Bellamy Reservoir. In September 2017, 23% of the supply came from wells, 77% from the reservoir.

River Flow

River Flow
Above Average
Average
Below Average
Low
Very Low
Drought

Portsmouth Water System operators track the USGS stream flow gauges in the Oyster River and Lamprey River to assess flow conditions. These gauged watersheds are used to assess the relative recharge to the Bellamy Reservoir through its tributaries, the Bellamy River and Mallego Brook.

Flow in the Oyster River fluctuated with the storms throughout September as presented on the following USGS graph. The storm on September 15th resulted in the peak daily average flow of 17.8 cfs and an instantaneous peak of nearly 50 cfs.



The monthly mean stream flow in the Oyster River at the USGS gauge was 3.60 cfs in September. This is 0.70 cfs (24%) higher than the 30-year September median flow rate of 2.90 cfs.

The monthly mean September stream flow in the Lamprey River at the USGS gauge was 57.4 cfs, which is 7.3 cfs (15%) higher than the 30-year September median flow rate of 50.1 cfs.

The current river flow conditions are considered **Average**.

Reservoir Level

Reservoir Level
Above Average
Average
Below Average
Low
Very Low
Drought

As the surface water source for the Madbury Water Treatment Facility, the Bellamy Reservoir is monitored to assess and predict the overall amount of water available for the Treatment Facility. Reservoir water levels are compared to typical monthly levels to assess the reservoir conditions.

The current stage of the reservoir is considered to be **Average** for this time of year. The precipitation that has occurred over the past ten months has continued to recharge the reservoir and maintain its level near the spillway.

Flow over the dam spillway ceased on August 1st. This typically occurs at the beginning of July. In mid-September the reservoir level rose slightly above the spillway for a week then dropped below the spillway by the end of the month. Water flow past the dam is controlled by an outlet valve. The flow into the Bellamy River is adjusted to rates that correlate with the Oyster River flow rate. The reservoir currently has approximately 582 million gallons of water above the lower surface water intake.

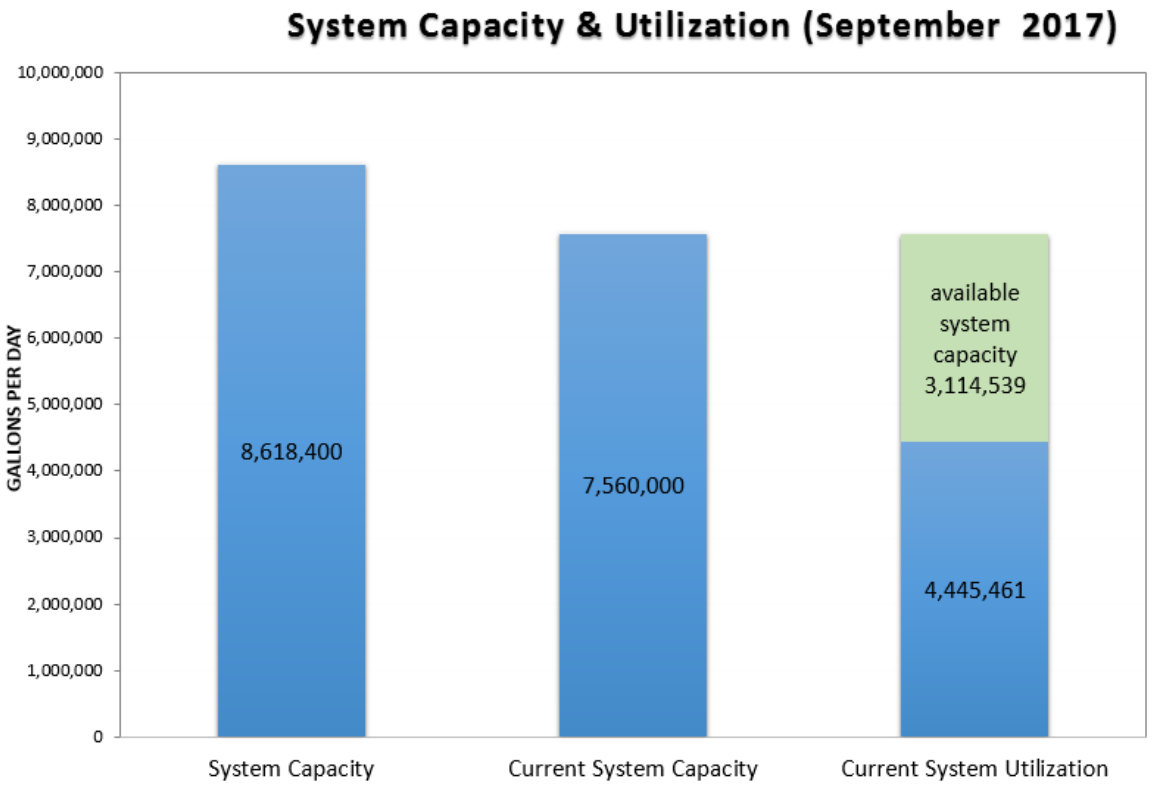
Water Supply Capability

Water Supply Capability
Above Normal
Normal
Below Normal
Restrictions Necessary
Additional Restrictions Necessary
Emergency

Water Supply Capability is a measure used to identify any issues with the Portsmouth Water Supply System that would result in a limitation to the amount of water that could be supplied. These could be lack of supply, issues with source water quality, or mechanical failures of system components.

The loss of the Haven Well as a water source (which contributed approximately 10% of the water system's overall capability) has reduced the amount of water that can be provided to the system. As a result of this reduced capacity, the water supply capability is considered **Below Normal** at this time.

All of the other wells and the treatment facility are in excellent operational conditions, thus the water demand is currently being met with conservative protections and redundancy in the system. Average daily demand is currently 59% of the current system capability.



Further Updates and Information

This information will be distributed electronically on the City of Portsmouth's website at: www.cityofportsmouth.com/publicworks/water/supply-status

If anyone needs additional information or has questions contact Al Pratt, Water Resource Manager at 520-0622 or Brian Goetz, Deputy Director of Public Works at 766-1420.