City of Portsmouth

Department of Public Works

November 6, 2018

Portsmouth Water Supply Status Report

Overview

Recent storms have helped recharge our groundwater supply sources and maintain full conditions in the Bellamy Reservoir. Colder temperatures over the past month have caused mixing of the water in the Bellamy Reservoir. As a result, the quality of the water in the reservoir in October required greater levels of treatment at the Water Treatment Facility in Madbury. With some treatment process modifications and a shift to groundwater sources the water operations have performed well to ensure the quality of the water delivered to the distribution system has remained the same through this period. Also during October, the water mains throughout the distribution system were flushed. Flushing is routinely conducted twice per year to remove iron deposits and other build-up from distribution pipes. This can also cause areas in the distribution system to experience slightly colored and turbid water. There are no health risks associated with this discoloration. By flushing water from your tap, the coloration will dissipate.

Water Use Restrictions

Customer Water Restrictions
N/A
None
Odd # Day Watering Only
Two-Days per Week Watering
No Lawn Watering
Essential Water Use Only

Higher than normal precipitation over the past three months have caused the quantity of available groundwater and surface water to be greater than normal for this time of year. The quality of the surface water has greatly improved and stabilized since the dynamic water quality changes that occurred in late September and October.

There are currently no water use restrictions in place. We continue to ask our water customers to please use water wisely, minimize waste, and incorporate water efficient fixtures and appliances whenever possible.

Water operations staff continue to assess the supply conditions and will provide updates as needed.

Current Customer Water Demand

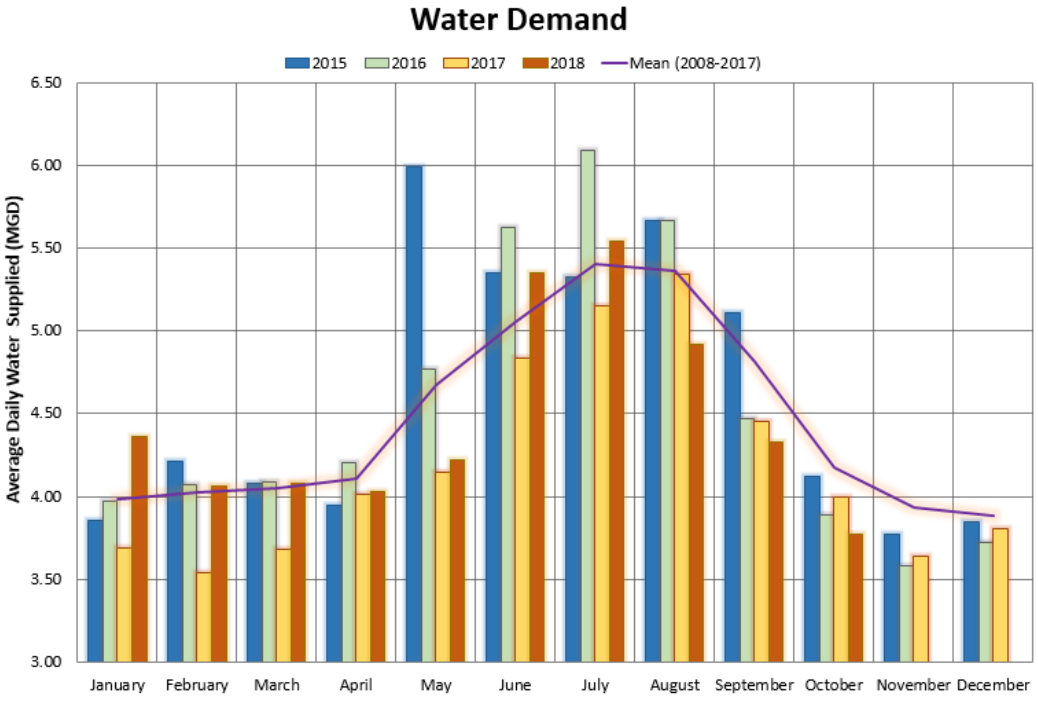
Current Water Demand
Below Normal
Normal
Above Normal
High
Very High
Historic High

Water demand fell considerably during September and through October due to cooler temperatures and multiple precipitation events. The average daily water demand in October 2018 was 3.77 MGD, which is about 10% lower than the 10-year average for October.

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.

Month	Monthly Demand (Million Gallons per Day (MGD))	Historic Average Demand (ten-year average (MGD))
October 2017	4.00	4.19
November 2017	3.64	3.94
December 2017	3.81	3.86
January 2018	4.36	4.03
February 2018	4.06	4.15
March 2018	4.08	4.11
April 2018	4.03	4.12
May 2018	4.22	4.67
June 2018	5.35	5.05
July 2018	5.55	5.40
August 2018	4.92	5.36
September 2018	4.33	4.82
October 2018	3.77	4.17

The following chart illustrates the average daily water demand by month over the

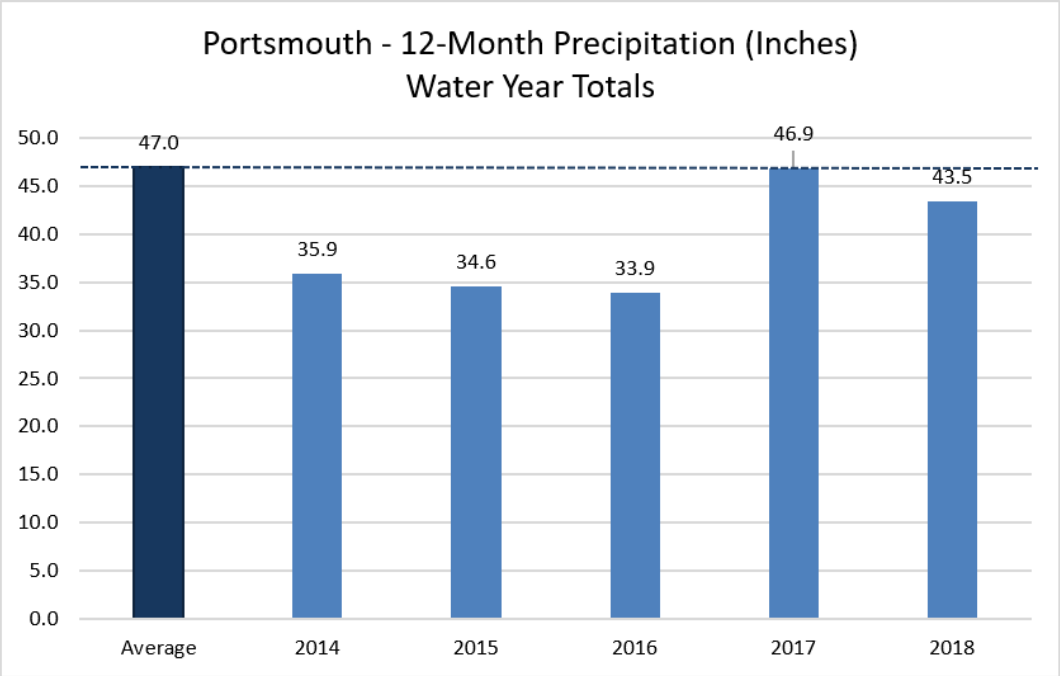


Precipitation Status

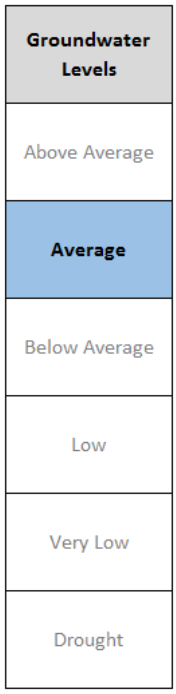
Precipitation
Above Average
Average
Below Average
Dry
Very Dry
Drought

Total October precipitation in Portsmouth was 3.88 inches. This is 0.81 inches less than normal for the month. Total precipitation in September was 5.81 which is about 38% greater than normal for the month. Over the past three months the total precipitation was 2.23 inches above normal. There were14 days in October that had measureable amounts of precipitation.

Precipitation over the past 12-months totaled 43.5 inches, which is 96% of the mean annual amount of 47 inches. Based on total water-year precipitation (October through September precipitation), the following graphic shows that last year was the wettest in four water years and much wetter than the three years leading up to the extreme drought during the summer of 2016. Rainfalls at the end of this summer helped precipitation to be near normal for this water year.



Groundwater Levels

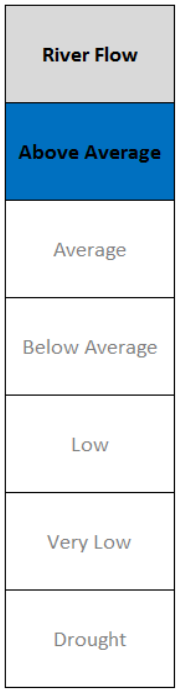


Previous operational changes which optimized the use of surface water have helped the water system preserve available water in our wells. Currently the groundwater levels are considered average. Groundwater levels in the Madbury aquifer are typical for this time of year. Water levels in our Portsmouth supply wells are slightly below average, but still within expected levels for this time of year. By utilizing a greater proportion of surface water from the Bellamy Reservoir during the winter and spring, we have been able to reserve the groundwater for the drier summer period.

Groundwater from wells in Madbury, Portsmouth, Greenland and the two Pease wells (Smith and Harrison) typically provide between 32% and 47% of the water supply to Portsmouth and Pease customers, with the remaining 53% to 68% from the Bellamy Reservoir. The following percentage of supply in October 2018 was derived from:

- 51% from the Bellamy Reservoir/Madbury Surface Water Treatment Facility
- 35% from the Madbury, Portsmouth and Greenland Wells
- 14% from the Pease Wells

River Flow



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.

The monthly mean October stream flow in the Oyster River at the USGS gauge was 17.6 cfs, which is 10.26 cfs (149%) higher than the 30-year October median flow rate of 7.07 cfs. The precipitation events in September and October caused sustained higher than normal flow conditions in the Oyster and Lamprey Rivers.

The monthly mean September stream flow in the Lamprey River at the USGS gauge was 318 cfs, which is 187 cfs (144%) higher than the 30-year October median flow rate of 130 cfs.

For this assessment, river flow conditions are considered above average.

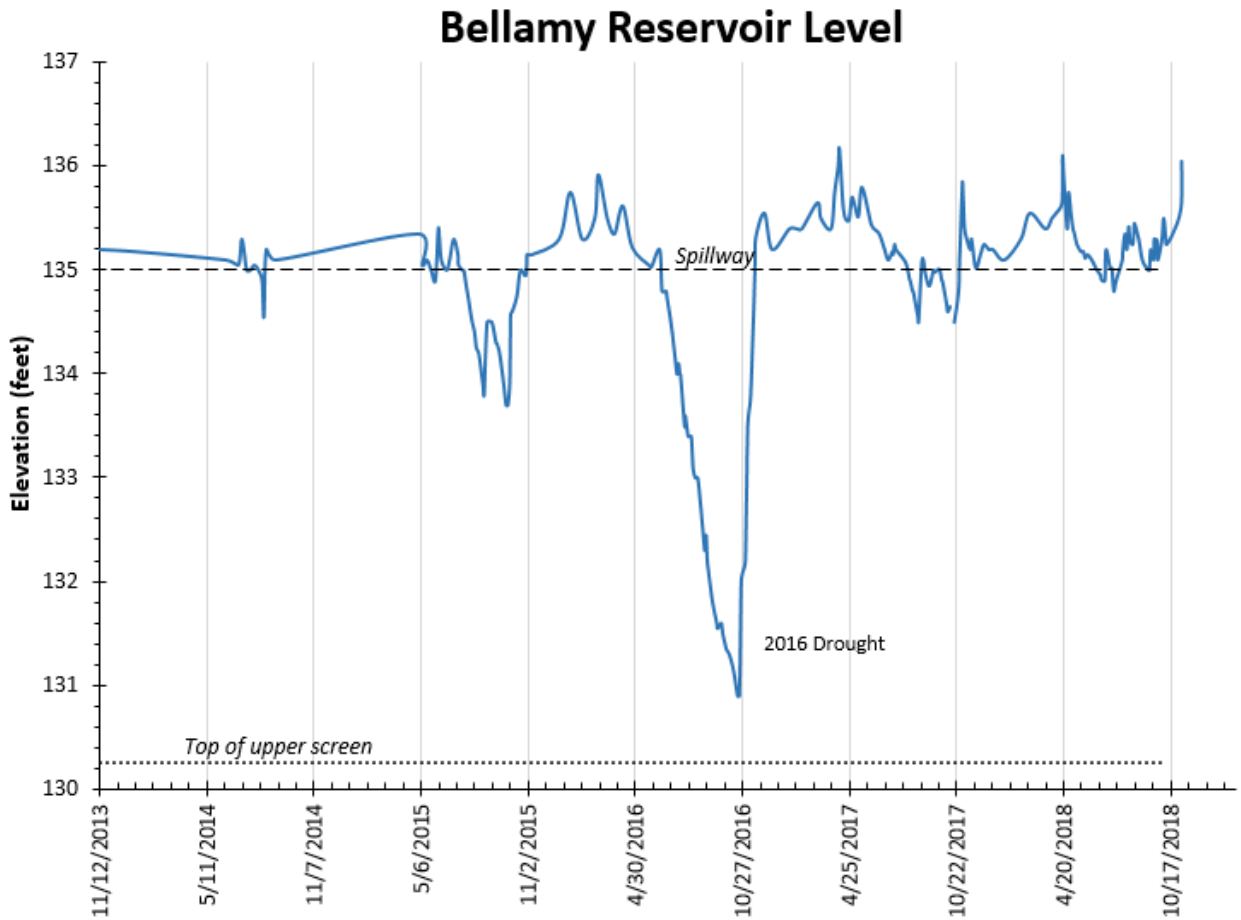
Reservoir Level

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. Typically rain events in September and October coupled with leaf fall and cooler temperatures cause the reservoir to recover from any depletion that occurs over the summer. Precipitation through much of the summer has kept the level of the reservoir near full conditions through most of this past summer.

At the end of October the reservoir was flowing over the spillway at a gauge height of 0.6 feet. This equates to approximately 700 million gallons of water above the lower surface water intake.



Water Supply Capability

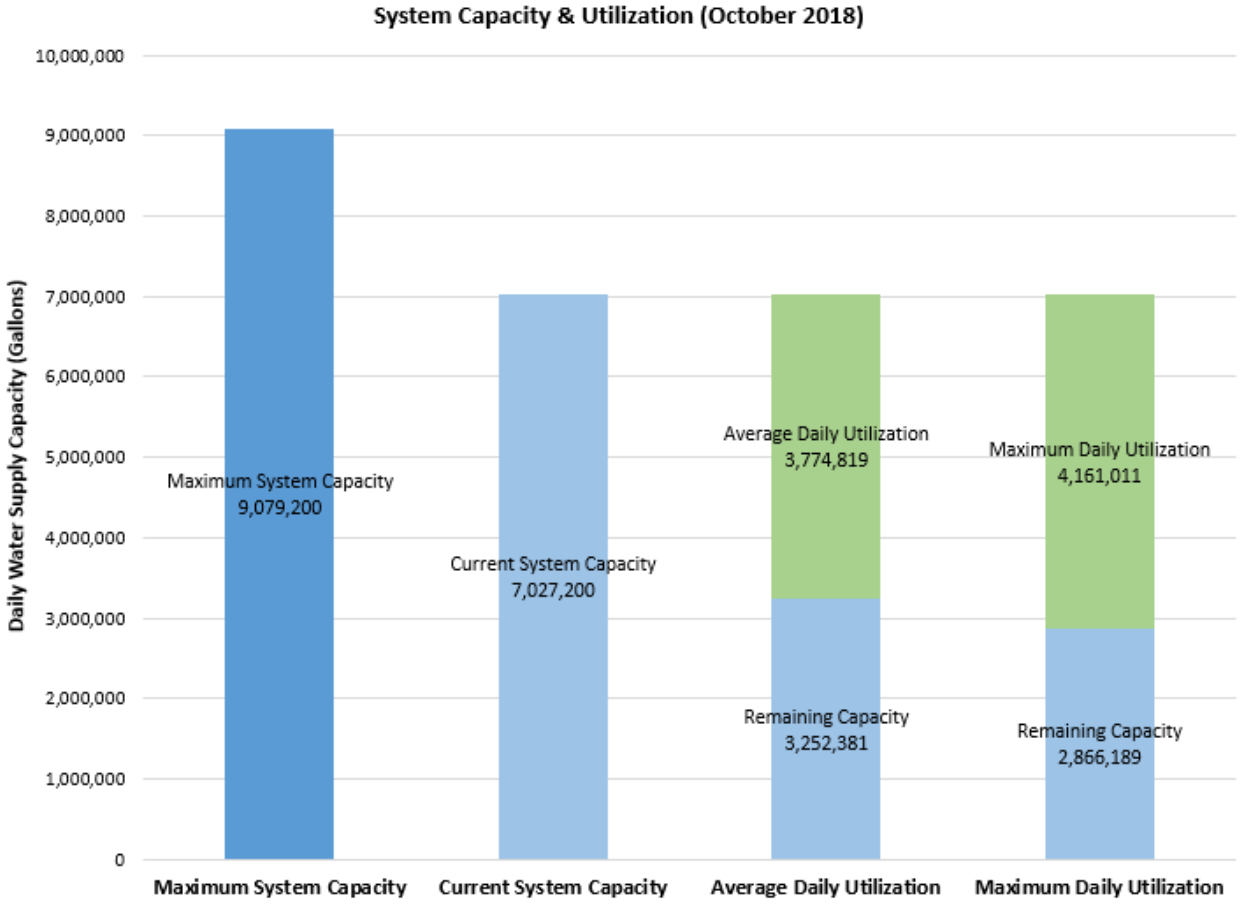
Water Supply Capability
Above Normal
Normal
Below Normal
Restrictions Necessary
Additional Restrictions Necessary
Emergency

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.

The recent precipitation, recharge and improved conditions in the Bellamy Reservoir have allowed us to re-gain capacity which was reduced in September and part of October.

Over the first few weeks of November, the granular activated carbon filters that are in-place to remove PFAS from the Smith and Harrison wells will be replaced. During that time, the capacity from these wells will be reduced and over some periods all of the water supplying the Tradeport will be pumped from the Portsmouth System.



Further Updates and Information

This information will be distributed electronically on the City of Portsmouth's website in the Department of Public Works > Operations > Water section. If anyone needs additional information or has questions contact Brian Goetz, Deputy Director of Public Works at 766-1420 or Al Pratt, Water Supply Operations Manager at 520-0622.