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Drought Information Update:
October 24, 2017

1. At the September 26, 2017 Board meeting, RWSA staff stated there was a "3% chance for the combined reservoir levels to be less than 75% after the next 12 weeks". On October 3, 2017 a Drought Watch was declared. Two days later, RWSA declared a Drought Warning with a request to the City and the County for mandatory restrictions. Please explain the sudden changes after it was said that the water supply was "in relatively good shape"?

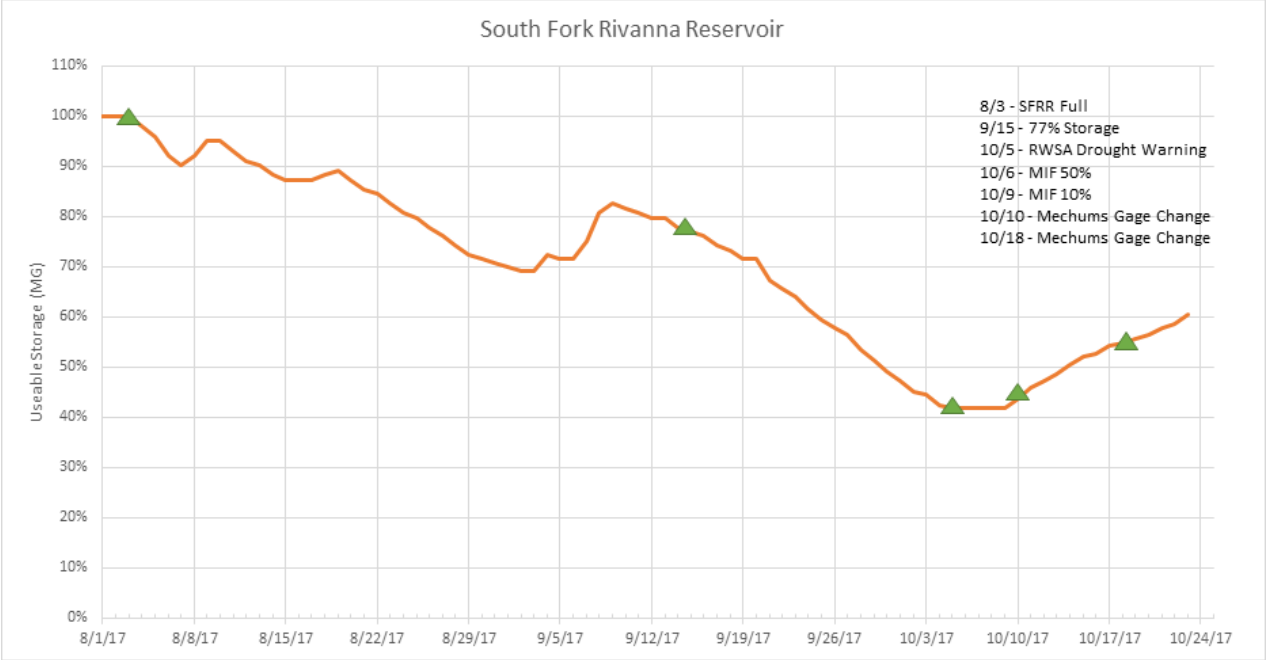
    a. The South Fork Rivanna Reservoir (SFRR) was 100% full on August 3rd and 77% full on September 15th. After observing a rapid decline in the SFRR, we followed the Regional Drought Management Plan (RDMP) and used the hydrologic model to predict the probability of a water shortage in the combined total storage of the three urban reservoirs (SFRR, Ragged Mountain, and Sugar Hollow). The model considers data such as expected rainfall, runoff potential, and water demand to predict reservoir levels 12 weeks ahead. On September 25th, the model predicted a 3% probability the urban reservoirs would be less than 75% full within 12 weeks. This probability indicated the reservoirs were collectively at an acceptable level, and did not meet the criteria for a Drought Watch as set forth in the RDMP.

    However, shortly after September 26th, staff noticed the continued rapid decline of the SFRR. A Drought Watch was declared on October 3rd as the SFRR dropped to 45% of capacity. Staff also immediately contacted the Virginia Department of Environmental Quality (VDEQ) to request a permit variance and reduce the required release from the SFRR from 70% to 10% of incoming flow. VDEQ indicated the community must be in mandatory water restrictions for the request to be considered. The RWSA Board of Directors declared a Drought Warning requesting mandatory restrictions be enacted by the City Council and the County Board of Supervisors on October 5th.

    The decline in the SFRR was rapid with a 32% decrease in storage from September 15th to October 2nd. This was a situation where we followed the RDMP and after doing so realized it was not giving us the whole story. We adjusted quickly with our drought management response to the declining conditions in the SFRR.

2. The South Fork Rivanna Reservoir (SFRR) water supply dropped to about 22 days. How could that have occurred without any public warning, when the worst level in 2002 was 60 days, and the community then was "extremely worried"?

    a. The water level in the SFRR declined rapidly between September 15th (77% full) and October 2nd (45% full) as outlined in the response to question one. Drought management measures were implemented on October 3rd when the consistent decline in the SFRR was identified.



3. How did we go from the South Fork Rivanna Reservoir (SFRR) being full on August 3rd to a drought water level on October 3rd?

    a. Water flows into the SFRR from the Moormans and Mechums Rivers, as well as other smaller tributaries. Water is taken out of the SFRR for treatment as drinking water at the South Rivanna Water Treatment Plant (SRWTP) to serve the Charlottesville, UVa, and Albemarle communities. Water is also released from the SFRR into the Rivanna River as required by the Virginia Department of Environmental Quality (VDEQ). Water levels in the SFRR declined significantly from August 3rd to October 3rd due to the amount of water being used by the SRWTP, water released into the river, and water lost through natural evaporation, which collectively exceeded the flow coming into the SFRR.

4. The Ragged Mountain Reservoir (RMR) has been nearly 90% full during most of this time. Why is the new RMR not providing enough water to offset the loss at South Fork Rivanna Reservoir?

    a. The RMR provides water for treatment only at the Observatory Water Treatment Plant (OWTP). While we are working on a water line project to transfer water from RMR to SFRR, currently there is no means to transfer water between the two reservoirs. Currently water

must be produced at both the OWTP and the South Rivanna Treatment Plant to serve Charlottesville and the urban areas of Albemarle County.

5. People in the community have noticed, and commented on, the dramatic reduction in water levels at South Fork Rivanna Reservoir (SFRR). Why did it take so long for RWSA to publicly address the situation?

    a. The SFRR was 100% full on August 3rd and 77% full on September 15th before declining rapidly over the following two weeks, to 45% full on October 2nd. Rivanna staff alerted the public to the concern, on October 3rd, as soon as the concern was fully identified.

6. Where did the 10 million gallons a day go that was initially talked about? Some have speculated there is a hole in the bottom of the reservoir?

    a. A loss of 10 million gallons per day was initially identified by staff as the difference between the inflow to the reservoir, measured by a gauge located in the Mechums River, and the water taken out of the reservoir to supply the South Rivanna Water Treatment Plant plus the water released from the reservoir into the river. We now know there was less water coming into the reservoir than indicated by the Mechums gauge. We continue to investigate the flow balance to assess the 10 million gallons a day initially identified. We have no evidence indicating there is a hole in the bottom of the reservoir.

7. There is speculation that the dam gates malfunctioned and released excess water to the river. Is that the real cause of the sudden drop in the reservoir level?

    a. We have three gates which release water through the dam. Two of the gates were releasing a total of about three million gallons per day. We have now adjusted the gates and reduced the release to a total of about 0.5 million gallons per day. The third gate has a meter to measure the outflow. This meter was installed in September 2016 and certified by the manufacturer to be properly installed. We are in the process of evaluating the meter to ensure it accurately measures flow out of the reservoir.

8. If it doesn't rain and we have an abnormally dry winter, as some long-range forecasts are predicting, what plan does RWSA have to provide the community with adequate drinking water?

    a. Currently the SFRR water levels are rising due to operational modifications, water conservation, reduced in stream flows, and rainfall. Should these levels not continue to rise, we have several additional measures to implement if we have an exceptionally dry winter, including:
        i. Releasing water from Sugar Hollow Reservoir to supply the SFRR
        ii. Releasing water from the Beaver Creek Reservoir to supply SFRR
        iii. Requesting a reduction in the release to the river to less than 10%
        iv. Using pumps to access additional water in the lower level of SFRR. This water has not been included in our calculations of "useable" reservoir storage

9. How do you address the statement that "the water supply plan is broken, and the in-stream releases required in the permit drained the reservoir?" Is this the cause of the water conservation measures?

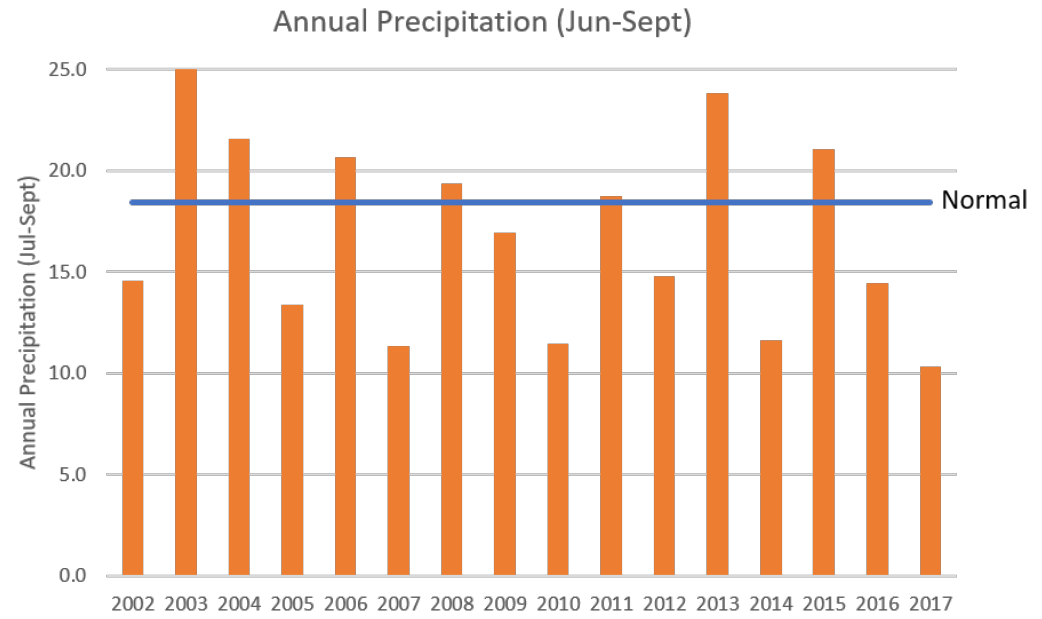
    a. The Water Supply Plan is working. The additional water supply created by constructing the new Ragged Mountain Reservoir (RMR) has increased our water supply by one billion gallons. Additional projects included in the Water Supply Plan are in progress, including:
        i. Alignment acquisition for a water line from the RMR to SFRR
        ii. An expansion of the Observatory Water Treatment Plant to allow treatment of a greater volume of water stored in the RMR
    b. Another important project is underway to extend a major water line from Avon Street to Pantops Mountain (completion of the Southern Loop).

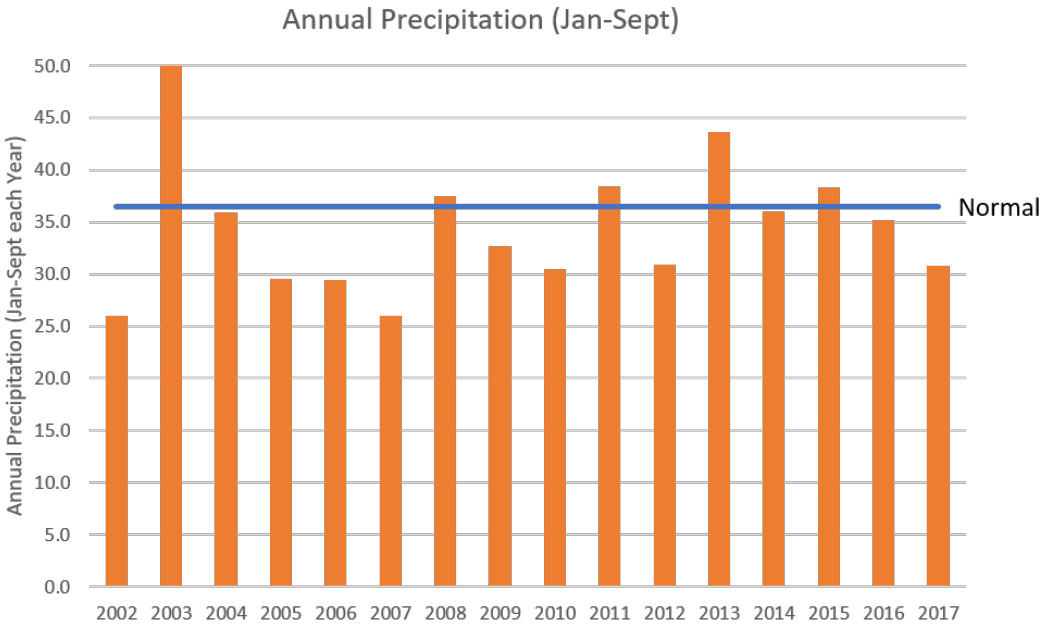
10. Is now the time to remove the sediment since the South Fork Rivanna Reservoir is down?

    a. The time required to obtain permits to perform a dredging project would be lengthy. In addition, a location for dewatering and disposal of dredge material has not been identified or secured.

11. What are the differences in rainfall from August to mid-September in 2015, 2016, and 2017?

	Rainfall (Inches)	
	June – September	January – September
2017	10	31
2016	14	35
2015	21	38
Normal	18	36





12. What "data driven points" determine when Emergency Water Restrictions would be declared by the RWSA Board? How do we give the community adequate notice that such restrictions are forthcoming?

    a. Emergency restrictions are not anticipated in the foreseeable future as the water level in the SFRR has been increasing daily since October 5th. Considerations for declaring an Emergency will include:
        i. The water level in the SFRR;
        ii. A significant decline in the water level in the SFRR;

iii. Short and long-term weather forecasts;
iv. The water level in the Sugar Hollow Reservoir, and
v. The water level in the Beaver Creek Reservoir.

b. If emergency measures are necessary, the community will be notified through media channels, the Rivanna webpage, and social media.

13. Did Rivanna lower the reservoirs in anticipation of the hurricane season?

    a. We did not lower the SFRR anticipating a major storm due to the uncertainty of storms impacting our area. Staff evaluates dam safety needs prior to tropical storm events.

14. Does the current Drought Management Plan work? If not, will the Drought Management Plan be revised?

    a. The Drought Management Plan works, but will be reviewed with VDEQ and supplemented as needed to capture the benefits realized through our experiences this year.

15. Going forward, what is RWSA doing to prevent a water shortage from happening next summer and fall?

    a. This is the first summer/fall since the new Ragged Mountain Dam was constructed and filled (2014-2015), and the initial opportunity to exercise the revised drought management program for the three urban reservoirs. Through this experience we will be better positioned with our operational and facility procedures to effectively manage our water supply, treatment, and distributions resources and minimize future water shortages.