

BOLINAS COMMUNITY PUBLIC UTILITY DISTRICT

BCPUD

BOX 390 270 ELM ROAD BOLINAS CALIFORNIA 94924

415 868 1224



MEMORANDUM

TO: Board of Directors

FROM: Jennifer Blackman

RE: Update on Water Supply

DATE: June 16, 2021

This memorandum provides a summary of the status of the District's water supply and current consumption data since the last memorandum to the Board dated May 19, 2021.

1. Water Supply: From May 20, 2021 – June 14, 2021 our diversions from the Arroyo Hondo Creek averaged 63,432 gallons per day (GPD), which was quite similar to the diversions from the prior month (64,500 GPD) and the month before that (65,702 GPD); no water was diverted from Woodrat 1 reservoir during this time, once again underscoring the beneficial impact of the community's conservation efforts.
2. Rainfall: Virtually no rain has been received during this timeframe¹. Total annual rainfall in the district (since July 1, 2020) is 16.42 inches. As a reminder, we received 22.7 inches of rain last year. Average annual rainfall received in Bolinas is 32.5 inches.
3. Woodrat 1 and Woodrat 2: Our stored usable water supply in the Woodrat reservoirs as of June 14, 2021 (combined) was 9,344,254², a decrease of 537,262 gallons in reservoir storage when compared to the 9,881,516 gallons in storage on May 17, 2021. This decline in storage between May and June is due to continued environmental losses (evaporation – which was much more pronounced due to the longer days and extremely windy weather in recent weeks -- and seepage) as well as possible measurement imprecision.
4. Water Consumption. From May 18, 2021 – June 14, 2021 water *production* averaged 60,104 GPD or approximately 102 GPD per connection. Water *consumption* during this same timeframe averaged 60,562 GPD, also approximately or 102 GPD per connection, which also was quite similar to the production and consumption during the prior reporting period (April 20, 2021 – May 17, 2021), which both averaged 103 GPD per connection. As a reminder, from March 20, 2021 - April 19, 2021, water *production* averaged 58,151 GPD or 98 GPD per connection and water *consumption* during this same timeframe averaged 58,827 GPD, or just under 100 GPD per connection. As such, the district's most current water production and consumption data is about the same as the prior reporting period, but higher than the March – April reporting period.

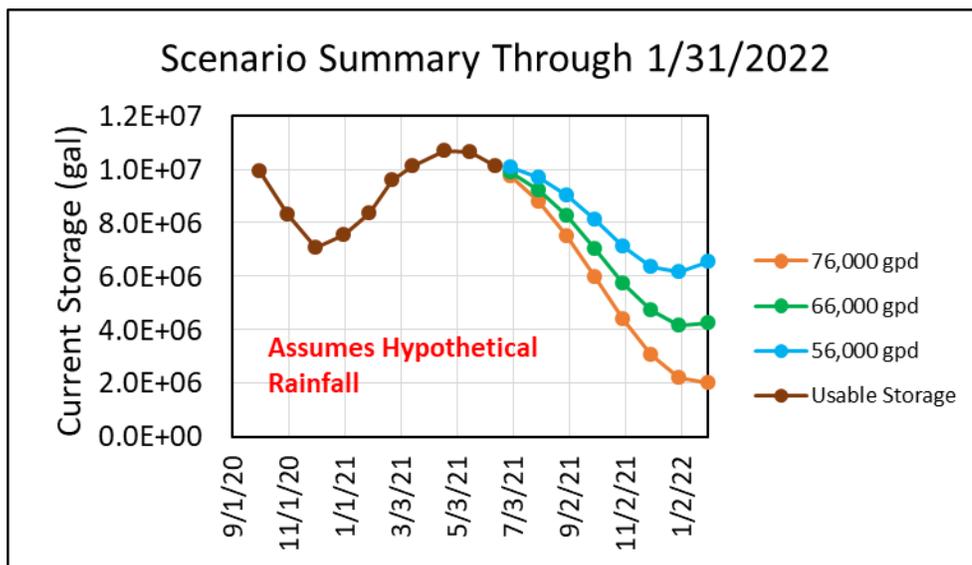
¹ Staff measured 0.12 of an inch of "rain" on June 14, 2021, which was a result of heavy fog that morning.

² We also had 780,542 gallons of treated water in storage in our East and West tanks (combined) as of June 14, 2021, for total usable water storage (treated + raw) of 10,094,796 gallons.

As noted, individual water consumption stayed about the same across the customer base in May 2021 as compared to April 2021 and that consumption remains quite uneven. For example, in May 2021, the highest 12 water users logged an average water use of 317 - 1,103 GPD. In May 2021, 22 customers (including the highest 12) used more than 200 gallons of water per day, whereas 33 customers did so in April. In May 2021, 108 customers used more than the anticipated ration amount of 125 gallons per day, whereas in April 2021, 129 customers did so. In May 2021, 194 customers used more than 100 gallons per day, whereas in April 2021, only 174 did so.

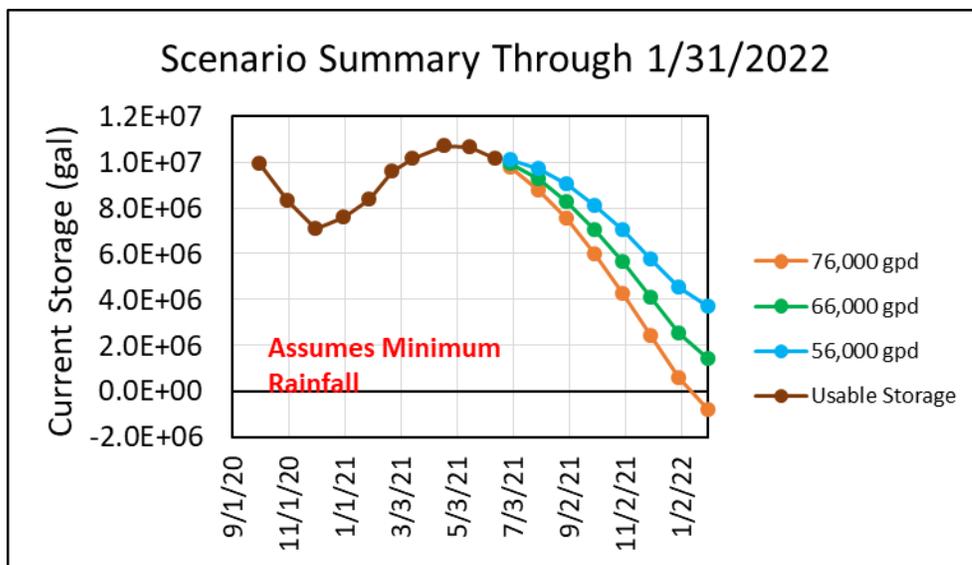
5. Updated Models:

The graph below is an updated Scenario Summary reflecting the actual data recorded as of June 14, 2021 (brown line in upper left area of graph with the ten dots) and the “fork” of projections as to how much stored water the district will have available through 2021 and beyond based on differing rates of overall community water consumption and based on an assumed (but hypothetical) receipt of 9.9 inches of rain during October 2021 through January 2022.³ The most recent seven-day running average community consumption is approximately 59,300 GPD placing the district closest to (but not on) the blue line right now, although water consumption has been starting to increase in recent days. This graph indicates that if consumption stays close to current levels (and at or below the ration trigger of 66,000 GPD) *and* the 9.9 inches of hypothetical rainfall occurs by January 31, 2022, the district will have between 4.3 and 6.5 million gallons of water in storage through January 2022 (green and blue dots on right side of graph box, respectively).



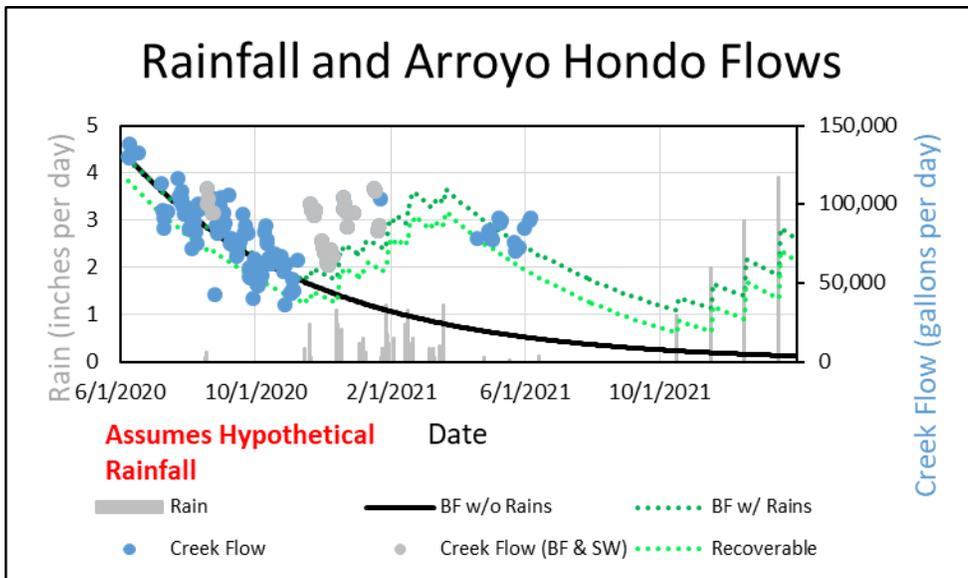
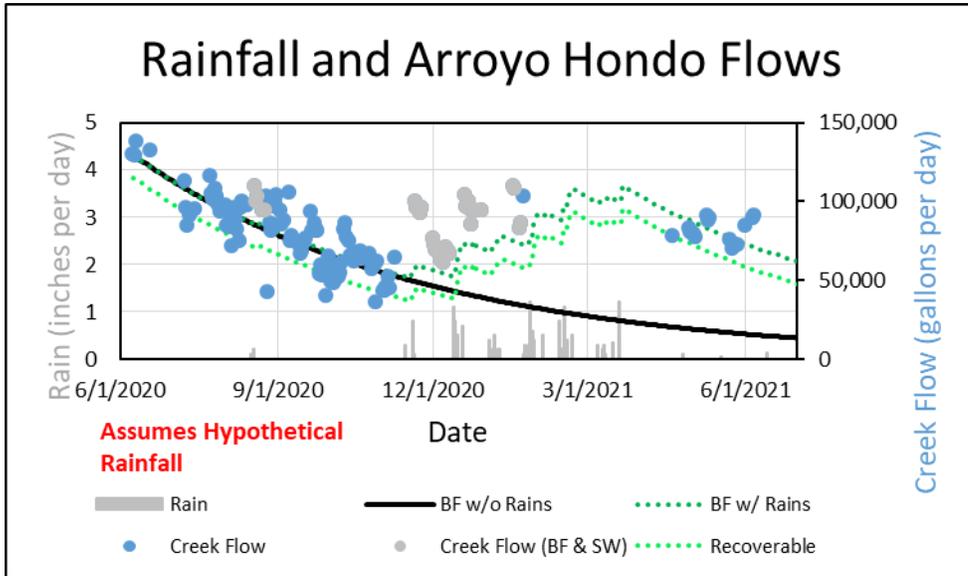
³ Please see my memo dated June 2, 2021, which was presented at a special Board meeting that evening, concerning the impact of late year rainfall on the district’s projected water supply.

The graph below is another version (updated) of the Scenario Summary, again reflecting the actual data recorded as of June 14, 2021 with the “fork” of projections as to how much stored water the district will have available through 2021 and beyond based on differing rates of overall community water consumption and based on an assumed receipt of the historic minimum level of rainfall (4.24 inches) during October 2021 through January 2022. This graph indicates that if consumption stays close to or below current levels *and* the district receives only the historic minimum monthly rainfall between October 2021 and January 2022, the district will have approximately 3.7 million of gallons of water in storage through January 2022 (blue dot on right side of graph box). If consumption increases to the ration trigger of 66,000 GPD, storage will be at only 1.4 million gallons by the end of January; and, if consumption were to increase to 76,000 GPD, the district would be out of stored water before the end of January 2022.

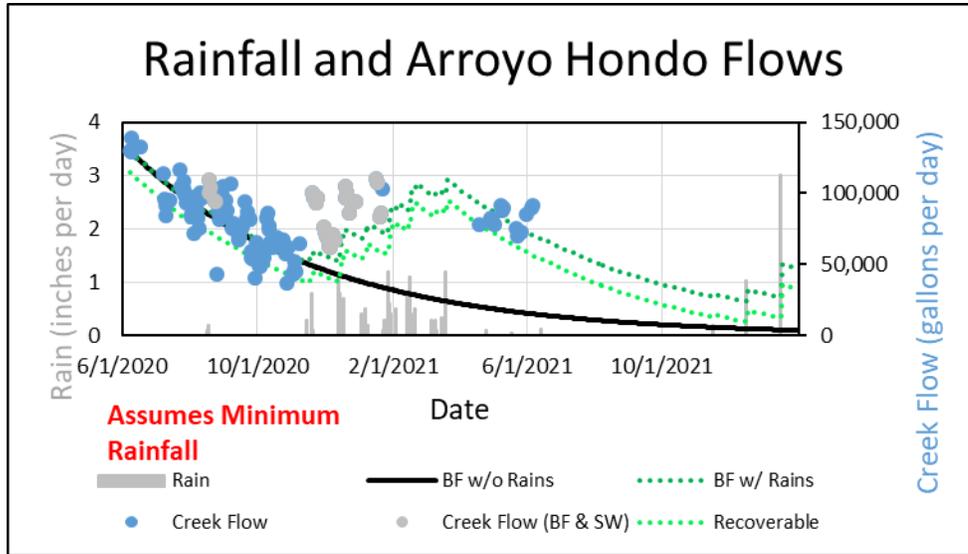


The next two graphs depict an updated base flow (BF) recession model for the Arroyo Hondo creek, updated to: (1) reflect an assumed (but hypothetical) rainfall of 9.9 inches by January 2022; (2) depict the recoverable creek flow (approximately 10 gallons per minute flows past/around the dam); and (3) correct the size of the storage area behind the dam from 1,995 sq. ft. to 1,500 sq. ft. The first graph shows conditions through June 2021, and the second projects creek flows (via the downward sloped dotted green lines) through January 31, 2022. The recoverable base flow⁴ remains essentially the same as previously predicted, with about 28,500 gallons of recoverable water per day by September 1, 2021.

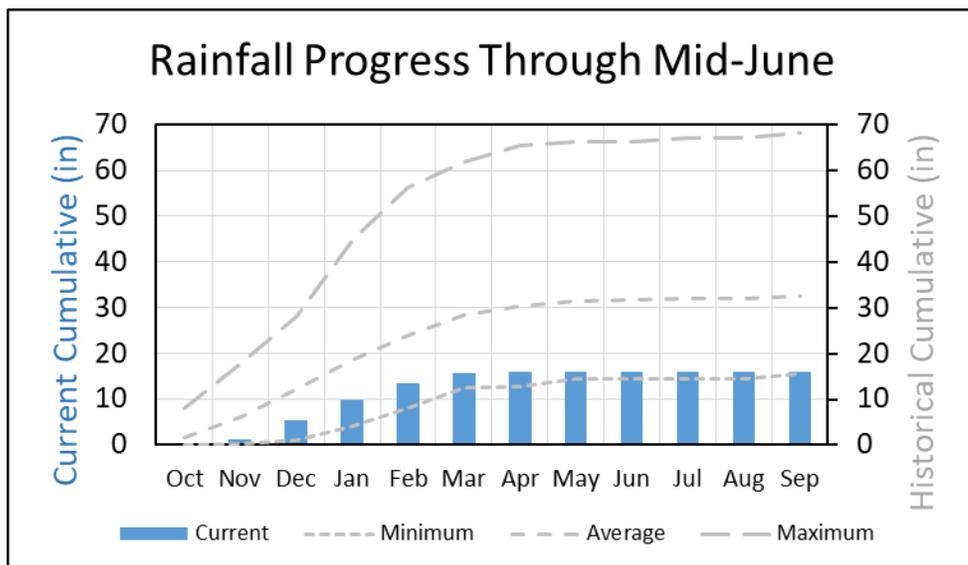
⁴ Dry season creek flow minus estimated flows past/around the dam.

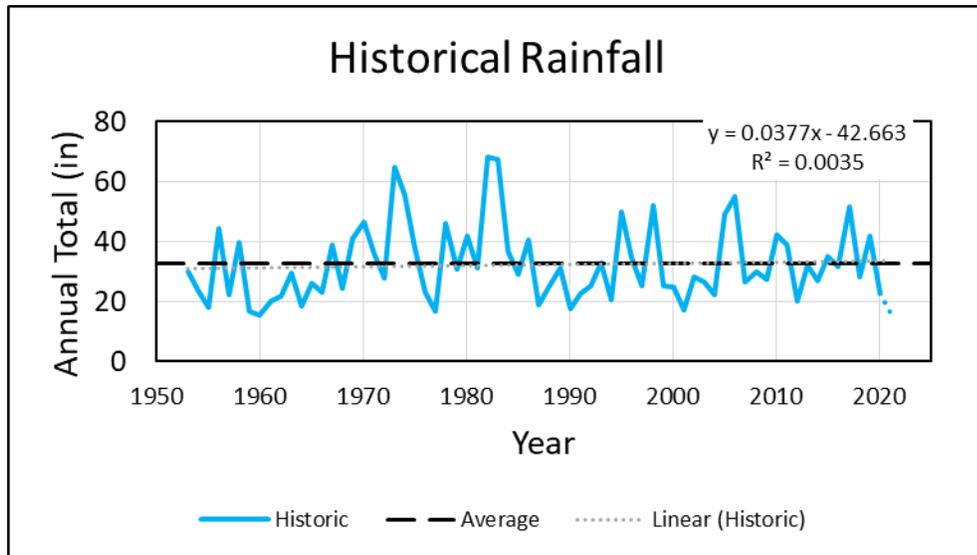


The next graph depicts the same updated base flow (BF) recession model for the Arroyo Hondo creek, but with an assumed historic minimum rainfall of 4.24 inches during October 2021 through January 2022. The recoverable base flow remains essentially the same through October and the creek flow response to the lower rainfall is, unsurprisingly, far less robust. Creek flows at January 31, 2022 are predicted to be approximately 47,000 GPD vs. approximately 70,000 GPD under the hypothetical rainfall assumption.

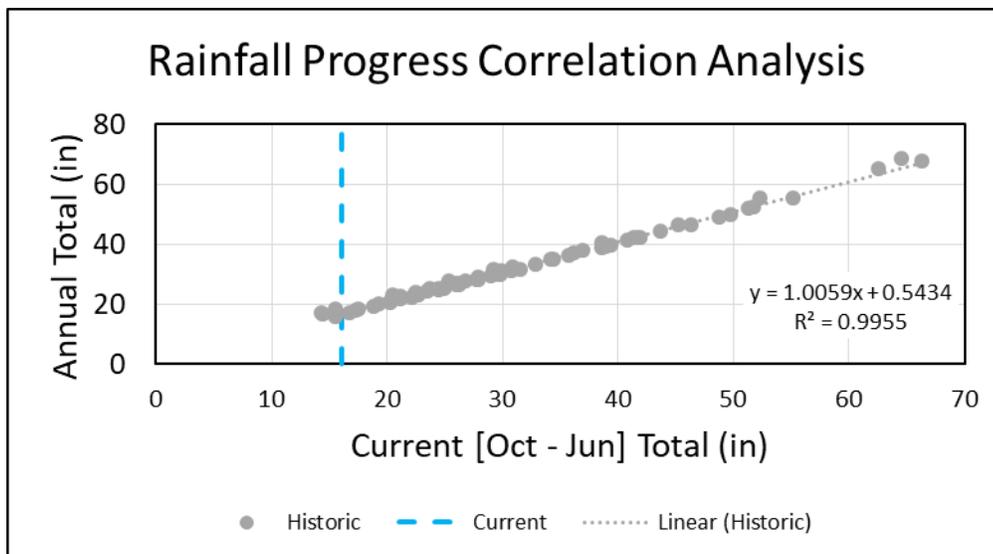


The next two graphs depict rainfall received in Bolinas as of June 14, 2021: 16.12 inches from October 1, 2020 – June 14, 2021) relative to historic minimum, average and maximum rainfall (68 years of BCPUD rainfall data); as these graphs show, the district has received only slightly above the minimum recorded rainfall for this time of year.





The graph below correlates the rainfall progress through June of each year with total annual rainfall for the available historical record (preceding 68 years). During that time, the district has experienced only 4 other years where the rainfall received was 16.12 inches or less through the end of May. Those rain years generally turned out to be *much* drier than normal years with a minimum total rainfall received of 15.6 inches, a maximum of 18.4 inches, an average of 16.9 inches and a line of “best fit” projection of 16.8 inches. These statistics reinforce the accepted prediction that the 2020-21 year will conclude as one of the lowest rainfall years on record.



Finally, this memo presents two photos of the “headwaters” of the Arroyo Hondo Creek for your consideration.

The first photo was taken by former General Manager Phil Buchanan in May 2005. During the 2004-2005 rain year (July 1, 2004 – June 30, 2005), the district received 48.80 inches of rain.

The second photo was taken by Lloyd and Evan Kahn on June 13, 2021. As previously noted in this memo, thus far in the 2020-21 rain year, the district has received 16.42 inches of rain.

