BCPUD Pipeline

Rainfall Report:

As of mid-January 2020, the BCPUD has recorded 13.8 inches of rain so far this "rain year", which began on July 1, 2019 and concludes on June 30, 2020. Although the dirt roads are mucky and the road-side ditches are soft, we actually have received considerably less rainfall so far this year than we did last year: by the end of January 2019, the BCPUD had recorded 18.1 inches of rain.

Notably, however, the BCPUD also recorded a whopping 23.8 inches of rain last year between February 1, 2019 and June 30, 2019. This amount represents more than half the 41.9 total inches of rain received between July 1, 2018 – June 30, 2019. In fact, history shows that it is not unusual for Bolinas to receive more rainfall in the second half of the rain year than in the first half.

All of this is to say there is plenty of time for Bolinas to receive more rain this year . . . but we can't count on it yet. So please – as always – do your best to conserve!

Thank you!
BCPUD Staff

> **Water or Sewer emergency? Please contact our office at 415-868-1224**

BCPUD Projects Planned for 2020!

Every year the BCPUD Board of Directors updates the district's Five-Year Capital Improvement Plan ("CIP"). This plan identifies key infrastructure and equipment belonging to the district and sets out a schedule for planned improvements and other projects. The update is coordinated with the district's annual budget process during which the Board of Directors' Finance Committee develops a proposed annual budget to fund the planned CIP projects as well as general operating and maintenance activities of the district, and employee wages and benefits. This year, the following CIP projects are among those planned:

### *Irrigation Pump Station Replacement Project (Sewer System)*

The district's sewer system consists of three key components: the collection system (a gravity-fed system of homeowner laterals connecting to district sewer mains that terminate at the downtown lift station on Wharf Road); the treatment system (an integrated pond system located at 101 Mesa Road which uses no chemicals in the treatment process, relying instead on a biological process of methane fermentation, with aeration and recirculation for odor control); and the disposal system (following primary and secondary treatment, the effluent is spray-irrigated on the disposal fields adjacent to Mesa Road, across the street from the Bolinas Firehouse).

To dispose of the treated effluent from the final treatment pond, the district uses an irrigation pump station (*pictured to the right inside the chain link fencing*) to draw the effluent from the pond and distribute it out to the disposal fields via a network of sprinklers. The existing irrigation pump station is nearing the end of its useful life as it is nearly 50 years old. The two existing pumps in the station are 40-hp vertical turbine pumps extending 15-feet below the ground surface, drawing effluent from near the bottom of the final treatment pond through an 85-foot subsurface horizontal pipe to the station. The station is controlled by a nearby electrical control panel; this equipment is not enclosed or otherwise protected from the coastal marine environment. BCPUD operators have experienced significant maintenance issues with the pumps, which are located in underground casings and therefore constantly exposed to a highly corrosive wastewater environment. A crane is required to lift the pumps out of their casings for maintenance and repairs, which is excessively expensive given the BCPUD's remote location and adds considerable to the expense of routine operation and maintenance.

At the recommendation of the district's engineers, the BCPUD has purchased a new, above-ground, fully integrated final effluent irrigation pump station that will be located adjacent to the existing station. The new station will be equipped with self-priming centrifugal pumps that will draw from the surface of the final treatment pond (rather than from the bottom of the pond, which occurs at present) and it will be fully enclosed in a fiberglass enclo-

e limnology
W.S. Elevation 259.5 ft
Surface Acres 1.96
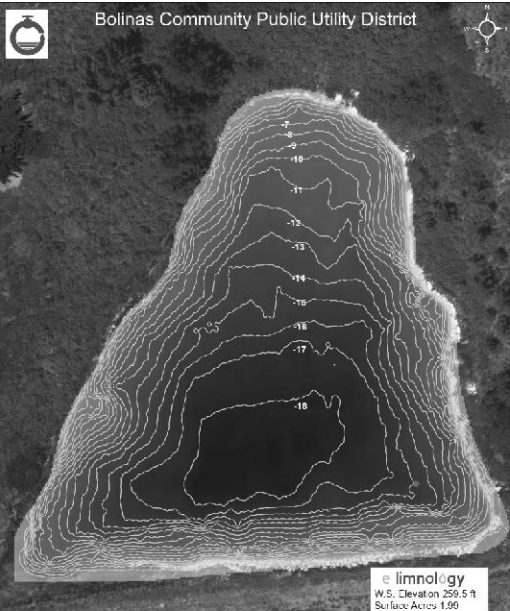
sure to protect it from the elements. Installation of the new pump station is expected to occur in the early Summer of 2020.

Woodrat 1 Reservoir Rehabilitation Project

During the course of the BCPUD's project to reduce the levels of chlorine disinfection byproducts in its treated drinking water (a problem eventually addressed by the installation of a pre-filtration in-line coagulation treatment system at the Woodrat Water Treatment Plant), the district became aware that the water quality in the Woodrat 1 Reservoir (*located directly behind the treatment plant on Mesa Road, see photo to the left*) needed attention. Over time, the reservoir has become highly eutrophic (low in dissolved oxygen), creating an environment conducive to the growth of algae and other nutrients which compromise water quality and are difficult to adequately treat to meet drinking water standards. The district retained a limnologist to advise the district on the best way to proceed. The limnologist first conducted a bathymetric mapping project to assess the morphology of the reservoir, including total volume, maximum and average depth and the contours (shape) of the reservoir. In addition, depth of sediment was measured to determine if sediment was a factor in any change of storage capacity as compared to the reservoir's original construction. Happily, the bathymetric mapping project revealed that storage capacity of the reservoir remained largely unchanged, thereby eliminating the need for any dredging or other potentially very expensive project to remove accumulated sediment.

Accordingly, the district is now focused on improving the water quality by raising the levels of dissolved oxygen in the reservoir as cost-effectively as possible. At the present time, the district is planning to test a proprietary "nanobubble" system. Nanobubbles are nano-size air bubbles that display unique properties in water: among other things, nanobubbles are not buoyant, they can remain suspended in water for months and they can aerate an entire lake. The district plans to use a nanobubble generator to inject nanobubbles of air into the reservoir via a compressor to aerate the lake and improve water quality. BCPUD staff will monitor the reservoir water overtime to ensure the nanobubble process is working. Installation of the nanobubble generator is planned for Spring of 2020.

Completion of the East Tank Rehabilitation Project

The district's project to rehabilitate the "East Tank", one of its two treated water storage tanks located on Mesa Road, is nearing completion following delays due to weather and due to significant unanticipated repairs that were needed to the roof of the tank as a result of extensive corrosion. Once the former coating was blasted off the tank interior at the outset of the project, it became clear that nearly 50% of the roof needed to be replaced. It required several months to engineer the roof repair component of the project, procure the needed materials, and install the new roof plates. (*See photo to the right of the roof repair underway.*). As of January 2020, the East Tank interior rehabilitation is fully complete and the tank is going back in service. However, there is work remaining on the exterior that can be done without containment, and we anticipate it will be completed once the rainy season is concluded, in the late Spring or early Summer 2020.

Planning for the West Tank Rehabilitation Project

As a result of the unanticipated nature of the extensive repairs needed to the East Tank, the BCPUD Board of Directors directed staff to obtain a full inspection of the West Tank as soon as possible to assess the condition of that tank so that the district can evaluate whether to accelerate the timeline for this project, which otherwise is scheduled to occur in approximately three years. Staff plans to drain the West Tank and schedule a full inspection as soon as possible during the Winter of 2020.