



**CITY OF FORT BRAGG**

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**COUNCIL COMMITTEE ITEM SUMMARY REPORT**

**MEETING DATE: NOVEMBER 24, 2020**  
**TO: PUBLIC WORKS AND FACILITIES COMMITTEE**  
**FROM: JOHN SMITH; PUBLIC WORKS DIRECTOR**  
**AGENDA ITEM TITLE: RECEIVE REPORT AND PROVIDE A  
RECOMMENDATION TO THE CITY COUNCIL  
REGARDING FUTURE CIP PROJECT PRIORITIES TO  
PROVIDE ADDITIONAL RAW WATER STORAGE**

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**BACKGROUND AND OVERVIEW:**

The City of Fort Bragg's water supply has been challenged by a worthy opponent. The current drought has provided an excellent test of our source water supply. There has been great concern by some about available water during the summer months from mid-July through October. Community based water resiliency is especially important in our remote area. Great progress has been made to increase water storage in order to bridge interruption of flow from source waters. The current Capital Improvement Program (CIP) provides an aggressive schedule to complete projects that fortify existing infrastructure. In addition to the approved CIP, staff has been looking into other water storage and new source options. It is the City's continued goal to prepare for emergency situations, such as earthquakes and drought, by improving existing infrastructure and continuing to look for additional creative water sources.

**ANALYSIS:**

**Water Supply and Capacity**

Fort Bragg's current water supply system relies solely on three surface water sources: Waterfall Gulch (tributary to Hare Creek), Newman Gulch (tributary to Noyo River), and the Noyo River (diversion at Madsen Hole). In 2015 the City's water supply system was able to store 6.6 million gallons of water that provided enough to maintain proper water system pressure and to provide a safety margin for fire-fighting flows. Five years later, the City has made great progress with water storage by including an additional 1.5 million

gallon finished water storage tank and the Summers Lane Reservoir with a raw water capacity of 14.7 million gallons, bringing our total water storage to 22.8 million gallons.

Below are our water sources and the average water provided by each under normal conditions:

Waterfall Gulch, 150 gallons per minute (gpm)

Newman Gulch, 150 gpm

Noyo River pumping, 300-400 gpm (as needed)

Summers Lane Reservoir, during the rainy season, rain capture is approximately 100,000 gallons per inch of rainfall.

During the winter and spring, pumping of the Noyo River is used only to supplement the Waterfall Gulch and Newman Gulch sources. The two tributary sources generally provide a higher quality of raw water and they gravity-feed to the water treatment plant, whereas water from the City's Noyo River diversion must be pumped. As summer progresses and the flows in the tributary streams diminish, the Noyo River diversion is used more frequently and in greater quantities. During the current drought, our new reservoir and the new finished water tank provided relief from what had caused a stage 3 water emergency in 2015. The extreme low flows during the drought combined with high tides did not allow us to pump from the Noyo river for extended periods of time. This cut our influent water supply in half. Throughout this drought season, the Summers Lane Reservoir has provided the three million gallons of water needed to bridge the low flow/high tide gaps in water supply.

### Priority Water Enterprise Capital Improvement Projects (identified in 5-Year CIP)

The City's water supply is one part of a larger system that includes treatment and distribution and are all necessary to bring finished water from the source to our customers. Water supply planning operates within the context of this larger system. The majority of the projects reflected by the water system improvements as summarized below from the 5-Year CIP are to ensure infrastructure resilience and water conservation:

1. Madsen Hole Ranney Design - \$185,000 - FY 22/23

This project will provide plans and specifications for the replacement of the existing degraded subsurface collector system. During high flows this system of pipes provides preliminary treatment at the Noyo River prior to pumping the water to the treatment plant. During the design phase of this project we will include a feasibility study to see if we are able to pull subsurface brackish water from below the river at this location.

2. Water Treatment Plant Rehabilitation - \$1,900,000 - FY 20/21

The existing filters and clarifiers are 30 years old and the time has come for a full scale rehabilitation of these facilities. This work will include the following items:

- Production efficiency enhancement of both treatment units;
- Completing structural repairs and reroof the main building;

- The addition of liners to reduce potential raw water losses from the raw water ponds, which currently has a semi pervious bottom;
  - Demolition of an existing concrete clarifier that is not in use; and
  - Design only for #2 water tank rehabilitation. This will include a fresh coat of paint inside and out and plumbing adjustments to place the fill and discharge lines on the exterior.
3. Raw Water Line Replacement (all segments) - \$6,500,000 - FY 22/23  
The City of Fort Bragg has three raw water sources, two of which deliver water to the water treatment facility through the use of a transmission line. Parts of the line have been in place for decades and are ready for replacement.
  4. Pudding Creek Water Main Relocation - \$1,669,000 - FY 22/23  
The relocations project will eliminate the on-going risk to the water main crossing the Pudding Creek Dam. The line will be relocated to the Pudding Creek Bridge simultaneously with Caltrans bridge widening project.
  5. Water Meter Replacement - \$2,900,000 – FY 20/21  
If funded, this project will replace and upgrade water meters throughout the City. The current meters are nearing the end of their useful life. The new meters are far more accurate and will provide up to date water use to the customer and save water by alerting customers of water leaks.
  6. #2 Water Tank Rehabilitation - \$850,000 – FY unknown  
The City owns and operates three 1.5 million gallon finished water tanks at the water treatment plant. Tank #2 is in need of maintenance. Design is expected to be completed by the engineering firm completing the Water Treatment Rehabilitation as described in CIP #1 above. This will provide a shovel ready project for future funding opportunities.

## **Projects to consider for future expansion of the water system**

### **I. Additional Reservoir**

With the successful completion of the Summers Lane Reservoir, the City has a good idea of what constructing a new reservoir would require. The addition of a second raw water reservoir would provide additional water storage during periods of source water low flow periods and/or additional storage during other emergencies. This option would provide the least amount of operation and maintenance cost with construction cost expected to be funded through grants.

### **II. Shallow Groundwater**

Staff has been working with equipment suppliers to identify small package treatment plants that may be used for shallow ground water purification. Ultrafiltration (UF) is a variety of membrane filtration in which hydrostatic pressure forces a liquid against a semi permeable membrane. The suspended solids are retained leaving a purified product.

Other uses for this unit could include filtration of brackish influent from the Noyo River. Mobile water filtration units provide needed flexibility during emergency situations as well.

### III. Wastewater Reclamation

The new Wastewater Treatment Facility has been upgraded to provide an effluent worthy of reclamation. Additional steps are needed to provide reclaimed water to customers. Improved filtration equipment at the Wastewater Treatment Plant will be required to clarify the water to the proper effluent quality. A project of this nature would require approval from the Regional Water Quality Control Board (RWQCB) and necessitate changes to our National Pollution Discharge Elimination System (NPDES) permit. The City could move forward with use of this water if end use customers are identified. It may be possible to exchange our reclaimed water for use of existing private shallow groundwater wells. These locations may also provide an opportunity to use mobile UF water treatment plants and inject that water directly into the distribution system.

### IV. Desalination System

Coleman Engineering provided a Technical Memorandum that provided good information about the desalination process and costs associated. With a price tag \$5.2 million and high annual maintenance costs, and lack of a current customer base to justify the cost benefit analysis, staff recommends pursuit of other options before this expenditure. However, staff will include the search for brackish water when completing the design our Ranney Collector System at the Noyo River as discussed above in the CIP section. This may provide brackish water that could be pumped to the water plant through existing conduit for treatment at the Water Plant. By overlapping these projects, we may be able to reduce startup costs.

### V. Additional Water Tank

The City currently operates and maintains three 1.5 million gallon water tanks. The addition of a new water tank would likely cause taste and odor issues caused by a lack of turnover throughout the tanks. Keeping the water fresh and as cool as possible provides a better tasting water and reduces chlorine use. It is not recommended that the City add another finished water tank based on the current daily demands of customers and the ratio of inflow and outflow of finished water available.

### Cost Comparison for Future Projects

Project	Initial Cost	O&M Cost	Environmental Cost
Additional Reservoir	Medium - \$2,200,000	Low	Medium
Shallow Groundwater	Medium - \$1,000,000	Medium	Low
Wastewater Reclamation	High - \$6,000,000	Medium - High	Low - Medium
Desalination System	High - \$5,500,000	High	Medium - High

The future is looking brighter for the City of Fort Bragg after completing a number of projects over the last five years including the Summers Lane Reservoir and new water tank. As we look toward the future of water supply resilience, the primary factors include water security for existing customers, potential new customers, funding opportunities, and staffing to support, start and maintain our precious water systems.

**RECOMMENDATION:**

Provide a recommendation to the City Council regarding future CIP project priorities to provide additional raw water storage.

**ALTERNATIVES:**

Combining different items from the above menu may provide similar results.

**ATTACHMENTS:**

1. 5 Year CIP for Water projects