

The Exceptional Performance Continues at Rural Water Plant

By Steve Erler



Located in Idyllwild California, Fern Valley Water District has shown effectiveness and efficiency since 1958. The raw water supply for the plant comes entirely from the nearby sources of Strawberry Creek and Tahquitz Creek.

Introduction

Located in the idyllic town of Idyllwild in the San Jacinto Mountains, Fern Valley Water District has been a trusted source of clean water since its inception. Throughout the year the characteristics of the raw water supply undoubtedly change due to weather. This causes high turbidities and increased coliform densities usually following heavy rainfall events. More changes come during warm spring weather which causes rapid melting of local winter snow pack, and summer low water flow when the creeks nearly dry up.

Committed to quality, the district has successfully served a community of 900, reaching a seasonal maximum population of 2,300 people, for 52 years. Recently, after a change in regulations for drinking water filtration by the Environmental Protection Agency, Fern Valley Water District was faced with the job of quickly updating their facility.

History

In January of 2005 new standards for small water treatment facilities were put into effect by the EPA which caused Fern Valley Water District's satisfactory treatment plant to fall out of compliance. The new standard, LT1ESWTR (see side bar), required at least a 2-log removal for *Cryptosporidium* for any water system

providing for less than 10,000 persons. With a 1.5 log removal for Cryptosporidium, the water system at Fern Valley was now slightly below the new requirement. As a result of the new standard, Fern Valley undertook the task of finding the best equipment to best meet their standards as well as the newly issued standards of the EPA.



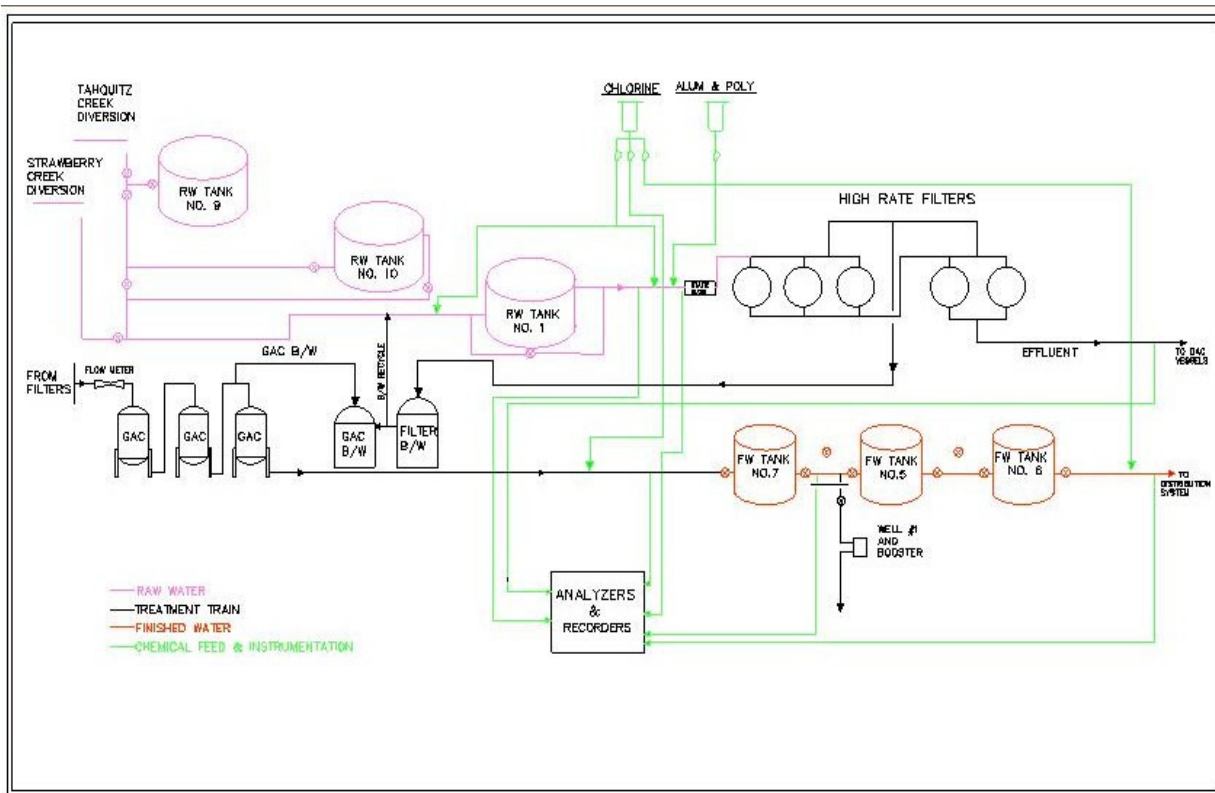
Solution

Fern Valley Water District decided to completely replace their existing water treatment system with new equipment that could ensure compliance with the new water treatment regulations. This would mean replacing all present multimedia filters, cartridge filters, and bag filters within the districts facility. To do this, Fern Valley's representatives visited locations with current filtration systems approved by the EPA in relation to the new LT1ESWTR. After much consideration, the district determined that EPD USA INC.'s high rate permanent media filtration system would be the best and most effective solution.

The selected EPD filters use EPA approved filtration technology for surface water treatment. The system meets the 2-log removal requirement for Cryptosporidium along with removal credits of 2-log for Giardia and 1-log for Viruses. With the addition of a new disinfection process, which must provide a 1-log inactivation of Giardia and 3-log inactivation of viruses, the entire plant would meet the requirement stated in LT1ESWTR. The EPD system includes 2 main stages of operation. Each EPD filter unit vessel has 16.5 square feet surface area, is 50 PSI steel, and is polyethylene lined. Stage 1 allows a filter loading rate of 6gpm/sq.ft., consists of three parallel filters, and yields a flow rate of 300gpm. Stage 2 allows a filter loading rate of 9gpm/sq.ft., consists of two parallel filters, also yielding a maximum flow rate of 300gpm. Each filter uses a single size media. The first stage filter uses 50x garnet (.27 mm) and the second stage filter uses 60/80x garnet (.15mm). The system has

automatic backwash capability, as well as turbidimeter and Chlorine analyzer controlled alarm callout and shutdown functions. The District alternates stage 1 and stage 2 backwashes weekly. The water is discharged into two 2,750-gallon polyethylene storage tanks. The stored water is decanted and a portion sent back to tank 1 where it is blended with raw water from the creeks.

Throughout the entire filtration process the only chemical addition required is aluminum sulfate. The new EPD filters and the new chlorination equipment work in concert to achieve a more efficient chlorination method that reduces prechlorination in the raw water tank (see fig.). It also allows for chlorine CT requirements to be met in the finished water tank (see fig.). The upgrade included a Chlor-Tec on-site generator, capable of producing 12 pounds per day of 8% Sodium Hypochlorite. The system consists of salt storage, water softeners, brine tank, 500 gallon day tank, and three VFD feed pumps (12gph). Pump #1 - 0.2-0.5 mg/l SWTP influent, Pump #2- 1.0-1.5 mg/l Tank 7 influent (CT tank), and Pump #3- 0.5-1.5 mg/l entering distribution system. All pumps controlled via chlorine residual feed back loop from the chlorine analyzer.



The result at Fern Valley was a new filtration system that exceeds not only the essential standards set by the EPA, but also the expectations of the District itself.

Current System Size

The typical daily production during peak tourist season is 300,000 + gal/day (depending on diversion and raw water capacity). Daily production during the off season is 115,000 gal/day. The plant has a nominal capacity of 300 gpm plus room for expansion to 400 gpm.

Conclusion

Now, after 4 years of continuous use, the EPD system at Fern Valley Water District is performing just as efficiently as the first day it was installed. The district stated that EPD made the entire installation process a pleasant one by providing fast installation and excellent tech support. “The EPD Filtration System is straightforward to maintain and reliable. Water quality test results have proven its efficacy and the quality of the treated water is superior, exceeding EPA’s mandated water quality standards.” All aspects of the installation have been positive and, most importantly, EPD filtration systems have helped maintain Fern Valley Water District’s pristine standards.



Long Term 1 Enhanced Surface Water Treatment Rule (LT1ESWTR):

This rule requires that a surface water source with a median coliform density of less than 1,000MPN/100ml must be treated to attain a 4-log removal/inactivation of viruses, a 3-log removal/inactivation of Giardia lamblia cysts, and a 2-log removal of Cryptosporidium. Removal of the impurities is accomplished through separation of bacteriological contamination of the surface water. Inactivation of bacterial contaminants is accomplished through the use of chemical disinfectant.

About the Author:

Steve Erler has been General Manager of Fern Valley Water District for 12 years. He also resides in Idyllwild which is part of the Fern Valley community.

Photography:

Lauren Berry is a free lance photographer specializing in product photos for manufacturers.