

Denver Water Foothills Tour, 2026

As shared by Bob Chapman

Bob Chapman recently traveled to Denver where he was treated to a detailed tour of the Foothills plant by current Denver Water operations and water quality staff. Following is his “thank you” account of the tour that he wanted to share with the few surviving individuals who were part of the original design team with him. He hopes this will bring back some fond memories of a super project team...including Denver Water staff, other consultants, and contractors.

Following are some observations from his trip and a few photos.



As you may recall, the original plant completed in 1983 had a rated capacity of 125 mgd, with provisions for future expansion in 125 mgd increments. In 1986, it was expanded to 250 mgd; and it has been performance tested to over 300 mgd. It is unlikely the plant will be expanded beyond this capacity due to Two Forks Reservoir never being constructed to yield additional source

water, as well as a new Denver Water WTP on the north end of their service area.

The access road and interior roads and site work are essentially the same as original, and in great shape. Trees are now large, and irrigated green grasses are phasing towards native grasses for environmental reasons.



The complex headworks facility consisting of a 1-megawatt generator driven by a Kaplan turbine, and the parallel energy dissipating valves, have worked beautifully... with kudos to Ralph Martin in particular, and Dick Nicols as well as I can recall. The mechanical governor on the generator was replaced by an electronic version. The bearings on the generator have been re-built twice. I still marvel at the facilities abilities to harness and control flows over a broad range while

synchronizing the generator output to the power supply, while delivering water into a very small after bay. Apparently, the after bay has never overflowed in over 40 years of operation.

Dave Etchart's computer control system has been replaced twice in the last 40 years. It appears "state of the art" to me. Foothills and Marston are now part of an operations subset, with a superintendent overseeing the joint operation. The current Foothills control system also has the capability to monitor and control the Marston plant remotely. The current operations people I met didn't seem to know that the original Foothills plant had a full redundant backup analog control panel in case the computer-controlled system failed!



The unique double-decker floc/sed basins, CY Shieh's creation, have been performing very well. The operators had many questions about how this design came about. The buried structure is in great shape. Some of the drives and chain tighteners have been replaced.

Stu, you were the lead on the filter complex as I recall. You should be particularly proud. As you know, backwashing issues can be the bane of filtration systems without great attention to details. In all these years, they have only had to replace five broken Leopold tiles under drain blocks! A few years ago, they completed a major project of pulling all the media out of the filters and re-grading it. After lots of study, they chose to rebuild the filters with the same dual media design as originally specified. A recent project was to replace all the primary valves in the filter galleries (96, as I recall) with new valves and electric operators. This was driven by a need to replace the electric operators, and an



asset management approach to standardize certain elements in all of their plants. The filters consistently produce 0.02 NTU water!

Structurally and architecturally, the plant is in excellent condition...a testimony to solid design, SDC, and construction expertise, and Denver Water's ongoing maintenance and asset management approaches. I'm sure Terry has many insights into the construction phases.

Significant additions since completion of the 250-mgd expansion in 1986



include a serpentine chlorine contact basin (where the 3rd and 4th phase filters were to be constructed), and an additional treated water storage reservoir (circular and partially exposed vs buried and hopper-bottomed). Essentially all of the chemical storage and feed systems have been changed or upgraded over time. Particularly unique is the chlorine storage and feed facility. Chlorine is still delivered by 25-ton trailers but now

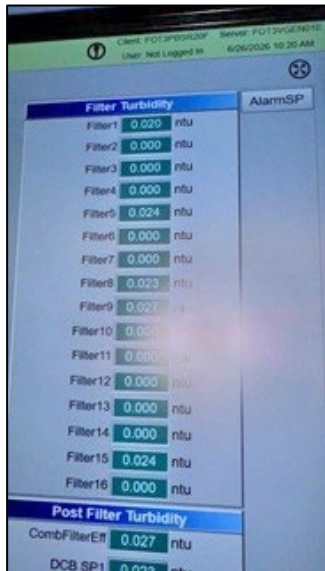
transferred to fixed bulk storage tanks. A caustic scrubber facility has been added capable of neutralizing tank loads of chlorine if ever necessary. A new potassium permanganate facility has been added near the headworks.



Operations Control Building



Entrance lobby of the Control Building



Filter turbidity monitoring.



Chemical storage and feed building.

Please pass this along to others who were involved with the Foothills project and might appreciate these reflections.

Best regards,

Bob