



Location: Vail, CO

Year: 2008 to 2009 for design; construction in 2010

Construction Dollar Value: \$0.5M, estimated

Owner: Eagle River Water and Sanitation District (ERWSD)

Contact: Todd Fessenden, Water System Manager, 970-477-5471

Key SGM Staff: Warren Swanson, PE; Ryan Loebach, PE; William Swigert, PE, SE; Terry Bendetti

Subconsultants and their project roles: Grand Valley Engineering Solutions (Electrical Engineer); Ralston Mechanical Consulting (Mechanical Engineer)

Client Benefits

- Cost-efficient harnessing of existing surplus water production capacity to meet rising demands
- Deferment of expensive future surface water treatment plant
- Improved system reliability and operational flexibility
- Improved facility reliability, capacity, controls, and working environment
- Improved system-wide water accounting capabilities

Challenges

- Hydraulic design challenges were overcome through consideration of multiple current and future system operational configurations, field flow testing, hydraulic model simulations, pressure transient analyses, careful pump selection, and specification of VFDs

In the 2006 Vail Water System Master Plan Update SGM identified improvements to ERWSD's In-Line Booster Pump Station (ILBPS) as a critical, cost-effective project to help meet future water needs in Vail's rapidly growing core. The ILBPS was an unreliable, under-sized, and under-utilized facility with numerous operational shortcomings. SGM identified its rehabilitation and expansion as a means to deliver surplus water production from a remote portion of Vail's system to the downtown core. The new facility would increase the overall system's usable water production capacity and operational flexibility. ERWSD contracted SGM to design a comprehensive ILBPS renovation as follow-on work to the successful master planning effort.

A unique project challenge, likely the root of the original facility's troubles, was that the facility's discharge pressure was due almost entirely to friction losses in a long transmission line; this made hydraulic design assumptions critical. To meet the challenge, the design team conducted extensive network modeling, considered existing and future operational/demand conditions, and performed hydrant flow testing in key areas. The design included variable frequency drives and premium efficiency motors to allow the operators to achieve a wide range of target flow rates with maximum efficiency. SGM incorporated a new pressure reducing valve to improve system fire flow delivery along with a new flow meter, pressure transmitters, telemetry improvements, electrical MCC, and HVAC/mechanical systems upgrades to dramatically improve station functionality. SGM will be providing construction observation and contract administration services during construction scheduled for 2010.

Project Elements

- Three new 800-GPM, 60-HP horizontal centrifugal pumps
- VFDs and premium efficiency motors throughout
- New magnetic flow meter for pump output control and water accounting
- New PRV for improved fire flow to major housing complex
- New suction/discharge piping
- New MCC and SCADA RTU
- New sump, HVAC equipment, and wall coatings for improved workspace environment