

## GREEN MOUNTAIN POWER PENSTOCK REPLACEMENT PHASE II

### MARSHFIELD, VT

#### THE CHALLENGE

Identify the appropriate penstock material for Green Mountain Power for Phase II of their penstock replacement project, which Pizzagalli originally began constructing the previous year.

#### THE SOLUTION

Provide alternative material options and a cost-benefit analysis.

#### DESCRIPTION

The overall project called for the replacement of approximately three miles of 60-inch penstock over a three-year period. The nearly 100-year-old wooden penstock, installed in the 1920s, was deteriorating and losing precious water. During Phase I, Pizzagalli replaced the penstock using a steel pipe material. World market conditions prior to the start of Phase II had substantially inflated the cost of steel materials. As a possible solution, the designer suggested installing fiberglass. Pizzagalli was concerned because fiberglass is prone to losing its shape and would also require more trenching and bedding to provide adequate support.

Pizzagalli contacted steel and fiberglass suppliers directly to analyze material costs and compiled separate estimates comparing excavation, bedding, and the differing connections required for each material. Pizzagalli found that the steel pipe system was slightly less expensive, readily available, and provided a longer life expectancy than the fiberglass system and was also consistent with the penstock



installed during Phase I. Based on our findings, Green Mountain Power agreed to the use of steel penstock to complete the remaining phases of the project.



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