

Zebra & Quagga Mussel Research Program

Research Note

Domestic Supply Intake Modification to Enable Quagga Mussel Control

Background

Much of Reclamation's existing infrastructure was not originally designed for controlling zebra and quagga mussel fouling. In many cases, domestic and cooling water intakes are not regulated at the reservoir. Instead, the nearest control valve may be located inside the dam or power plant. Without the ability to shut-off pipelines at the source, considerable lengths of intake pipe are susceptible to mussel fouling making it difficult and costly to maintain (i.e., chemically treat or manually cleanout.) Figure 1 shows the heavily fouled domestic water intake grating at Reclamation's Davis Dam. This intake is located at a depth of approximately 80 ft and the image highlights the difficulties in maintaining operability for such a system. Another considerable difficulty is that in some cases these intakes are located inside of power intake trashrack structures, meaning that units would require shut down in order to clean the lines manually using divers and water jetting equipment.



Figure 1. Heavy quagga mussel fouling on domestic intake at Davis dam.

Project Description

As a means for maintaining the domestic supply system at Davis dam, modifications to the intake were designed to allow shut off at the reservoir. The retrofit comprises a pneumatically operated knife gate (Fig. 2). In December 2008, the valve assembly was installed at Davis Dam by divers.

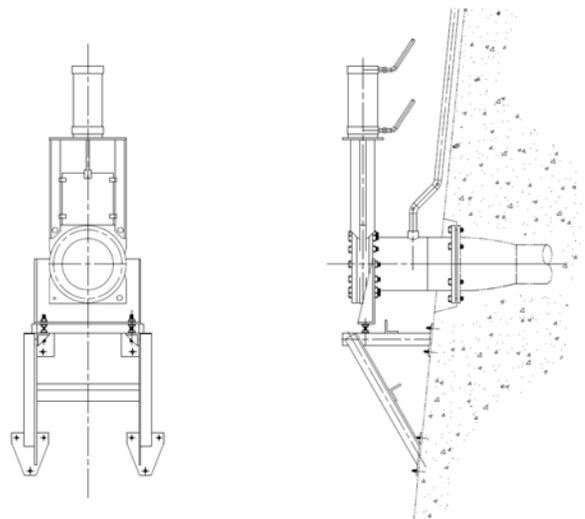


Figure 2. Schematic of shut off retrofit.

The knife gate assembly consisted of a 2-ft-long, 10-in-diameter pipe extension connected to the existing intake grating flange (Fig. 3).



Figure 3. Knife gate assembly prior to installation

The extension was equipped with a 2-in-diameter female coupling connected to a 2-in-diameter feed line running up to the surface. Finally, a support structure was

included for the entire valve assembly and attached to the dam face.

Outcomes

The domestic intake retrofit at Davis Dam is expected to provide considerable flexibility in options for controlling domestic supply system quagga mussel fouling. In particular, this retrofit will allow for testing, in the coming months, of a promising bacterial product *Pseudomonas fluorescens* and other chemical or biological treatment options without discharging any of the treated water. Furthermore, project management will now have the option for manual cleanout from inside the plant to maintain the 105 ft intake pipeline, thus eliminating the need for costly diver support.

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