

Bethany Kelly

A study at the Hardy Dam was performed to evaluate the hydraulic interconnection between the reservoir and downstream seepage. At the site, seepage (including springs and boils) is observed approximately 300 to well over 1,000 feet downstream of the dam and in the river bottom. Natural artesian pressures were known to exist in the area prior to dam construction and relief wells were installed near the on-land springs and boils to relieve artesian pressures below the dam beginning in the 1940s; however, new boils have continued to develop, which raised concerns regarding risks associated with a hydraulic connection between these boils and the reservoir. To better define site conditions, a multi-year monitoring program was implemented, including field and laboratory testing for natural tracer on water samples collected across the site. Several techniques were used in the monitoring program, though isotope and temperature testing were found to be most helpful in providing an understanding of the hydrogeology of the area and substantiate that the tracer signature of the majority of the downstream seepage did not match the reservoir water's tracer signature. The data further revealed an interesting pattern related to seasonal operation of the reservoir and its relationship with groundwater. The paper presents the hydrogeologic setting, methods, and results, providing laboratory data supporting conclusions on the source of the downstream seepage, and other site considerations.