Water on the Fly
The Atglen & Susquehanna in West Sadsbury Township

During the decades of steam locomotion, water supply and consumption were key to the PRR’s success. By volume, a steam locomotive could consume eight times as much water as coal. Increasing the size of tenders (a combined coal and water tank hauled behind the locomotive) did little to improve efficiency as time and fuel were expended to stop for water. Track pans allowed a moving locomotive to scoop water from a rail-level trough.

The A&S and the PRR’s main line (curving north around Zion Hill) shared water facilities that included a two-million gallon reservoir and valve house (upper right image) on Zion Hill. A combination steam plant and pumping station (left images) filled four track pans on the main line and two on the A&S. Coal-fired boilers provided steam to keep the pans from freezing, allowing year-round use.

Water spraying beyond the scoop was exciting to watch, but it saturated the trackbed and often required additional systems to drain the excess water. Under the best water pick-up scenario, at least ten percent of the volume scooped did not reach the tender. Combined, the six track pans west of Atglen had an estimated design consumption exceeding 750,000 gallons per day.

Water was heavy and hauling it on a train often required eliminating a revenue-producing car or two. The PRR’s best and time-sensitive eastern routes benefited greatly from the use of track pans; they were cost-effective only for high-volume traffic. Their use implied elaborate rules to govern track speed and scoop depth to ensure safe and maximum water removal. Once committed to scooping water, a locomotive faced a severe penalty in lost time if it failed to adequately fill.

Tests conducted between 1906 and 1910 at Atglen helped the PRR to determine optimum operational parameters including pan width (18-inch sandbox trough) and pan length (PPR averaged 1500 linear feet) and the speed for water removal (between 40 and 50 mph at most locations). Smooth pan rims were preferred, and they were not typically designed for curves exceeding three percent. The Atglen pans were on a two percent curve.