

Fallingwater WWP and Buried Utilities Project, Mill Run, Pennsylvania

- Project received the Design Build Institute of America (DBIA) Award for water projects under \$15 million in 2005
- \$9.1-million project to improve the water, wastewater, and communications systems
- Environmentally responsible project featuring a zero effluent discharge wastewater treatment plant
- Biological membrane treatment followed by carbon absorption and ultraviolet disinfection

In 1999 the Western Pennsylvania Conservancy (WPC) selected CH2M HILL to provide design and construction delivery services for improving the water, wastewater, and communications systems at Fallingwater, the world-famous "house on the waterfall," designed and built by Frank Lloyd Wright – one of the most important architecture and design figures of the 20th century. Constructed in the 1930's, the Main House is cantilevered over a waterfall located on Bear Run, a stream of "exceptional value" as categorized by the State of Pennsylvania.

To meet the WPC's mission of conservation and protection of the environment, and to protect Bear Run, a new zero-discharge wastewater management system was designed. The treatment processes selected for Fallingwater includes a biological membrane treatment system followed by carbon absorption and ultraviolet (UV) disinfection. These treatment processes produce an effluent suitable for reuse and recycling. The wastewater generated at the site is collected and treated with a significant portion of the treated wastewater being reused for onsite landscape irrigation and recycled for use as toilet flush water at the Visitors' Pavilion. None of the treated effluent is discharged to Bear Run.



Over 4,000 linear feet of HDPE pipe has been designed to convey the reclaimed water to Visitors' Pavilion and Interpretative Center. Similar to the collection piping, over half of the piping was installed using horizontal directional drilling to minimize site disturbance. The remainder of the piping (at less sensitive locations) was installed using conventional trenching methods.

Rather than build an upgraded water treatment system, WPC connected to a public water system. The nearby local water authority plans to extend one of its transmission lines to, and beyond, the Fallingwater site. To convey the public water to various onsite facilities, over 6,300 linear feet of water distribution piping was installed. A combination of horizontal directional drilling and conventional trenching methods was used to install the pipe.

To improve communications at the Fallingwater site, the existing fiber optic and telephone systems were expanded. Over 3,000 linear feet of conduits and cables was installed using a combination of horizontal directional drilling and conventional trenching methods.

In November of 2005, Fallingwater Wastewater Pumping, Treatment, and Reuse Systems received the DBIA Award for water projects under \$15 million. This challenging and high-profile project is a testament of CH2M HILL's technological capability and the application of it to design-build projects.