VIRGINIA TREATMENT PLANT COMPLETES MAJOR DESIGN-BUILD UPGRADES

Projects at Noman M. Cole, Jr., Pollution Control Plant Enhance Flow Equalization and Add Reclaimed Water Distribution System

Two major design-build projects have recently been completed at the Noman M. Cole, Jr., Pollution Control Plant (NCPCP) in Lorton, Virginia. The upgrades, designed by Dewberry and constructed by M.A. Bongiovanni, Inc., include an $8-million flow equalization facilities expansion project that protects the wastewater treatment process from high influent flow rates and a $15.2-million reclaimed water distribution system that enables treated effluent to be reused at the Covanta Energy/Resource Recovery Facility and at nearby recreational areas.

The flow equalization facilities expansion project included the design, construction, and start-up of new equalization facilities that reduce peak flows to the plant’s biological nutrient removal activated sludge tanks. The facilities pump primary effluent to an equalization tank during influent high-flow conditions, and return the effluent to the primary channel when influent flows decrease.

The project included the addition of nine MGD of pumping capacity at the existing equalization pump station, including instrumentation and controls and a new four-million-gallon equalization tank.

The water reclamation project conserves and recycles wastewater, with a 4.6-mile pipeline that originates at the NCPCP. From there, approximately 560 million gallons of treated water each year will be distributed for reuse at the Covanta plant, one of the largest waste-to-energy facilities in the country. Approximately 24 million gallons a year will be distributed to the county’s Laurel Hill Golf Course and Lower Potomac Ball Fields for irrigation purposes.

The reclamation reduces the amount of wastewater treated at the NCPCP and the amount of discharge to Pohick Creek, a tributary of the Vir...
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Potomac River and the Chesapeake Bay. Known as a “purple pipe” project because reclaimed water is distributed in purple color-coded pipes in the United States to distinguish it from potable water, the project was funded in part by a grant through the American Recovery and Reinvestment Act.

Dewberry’s services for the purple pipe project included reclaimed water pumps, storage, chlorination, and pipeline design; application of 3D civil engineering technology; surveying; environmental engineering; permitting assistance; and utility coordination services. The Dewberry team used advanced design and visualization technology from Autodesk, Inc. throughout the project, including AutoCAD Civil 3D, AutoCAD Map 3D, and Autodesk 3ds Max Design. The technology aided in modeling the pipeline corridor’s existing conditions, creating initial alignment studies and visualizations, facilitating public hearings, and communicating design intent to the county and contractors.

In addition to the two most recent design-build projects, Dewberry has completed extensive work at NCPCP in past years, including the engineering of a new 100-MGD raw wastewater/equalization pumping station, a 16-million-gallon concrete equalization basin, and several thousand feet of piping, along with associated site development services. The previous expansion work was completed in association with CH2M Hill.

The NCPCP opened in 1970 as an 18-MGD plant and has undergone three major upgrades to bring it to its current capacity of 67 MGD. The plant serves approximately half of Fairfax County’s 340,000 households and businesses.

Photos by Dave Huh, courtesy of Dewberry.