

PROJECT DESCRIPTION

Grantee: Fairfax County

Grant: #440-S-16-01

Project Description

The District of Columbia Water and Sewer Authority (DC Water) is constructing Enhanced Nutrient Removal (ENR) facilities and wet weather management facilities for the Blue Plains Advanced Wastewater Treatment Plant (Blue Plains WWTP) and collection system to meet its NPDES Permit limits and other regulatory requirements.

Blue Plains has an average daily capacity of 370 MGD, and serves the District of Columbia, portions of southern Maryland and portions of Northern Virginia. Under the Inter-Municipal Agreement (IMA), all of the jurisdictions served by Blue Plains, including Fairfax County, convey wastewater to Blue Plains for treatment. All jurisdictions are pro-rata responsible for upgrades to Blue Plains, as defined by the IMA. Fairfax County's prorated contribution to the Blue Plains WWTP is 8.38%.

By enlarging the wet weather facilities to meet the ENR requirements, the proposed improvements result in a peaking factor of 1.5 for a peak flow of 555 MGD to complete treatment, which allows DC Water to operate the biological processes at the capacity of the existing clarifiers. Excess flows will be routed to the Blue Plains Tunnel for storage and pumped to the Enhanced Clarification Facility (ECF) for treatment. At the end of the wet weather event, effluent from the ECF will be routed to the secondary treatment process until the tunnel is dewatered. Working within the existing plant capacity results in a significant cost savings.

The ENR upgrades and supporting projects include:

- Enhanced Clarification Facility (E800), which will treat excess flow during wet weather events. The dewatering pumping station will discharge flows from the Blue Plains tunnel during wet weather conditions. Following the storm event the ECF will discharge effluent to the secondary treatment process. The ECF uses a high rate settling process to remove approximately 35% of the total nitrogen load to the process, as well as other nutrients considered harmful to the Chesapeake Bay. The estimated cost for this facility and the tunnel dewatering pump station are itemized in the table below.

Schedule: A design-build contract was issued for this facility and the Blue Plains Tunnel Dewatering Pump Station (FR00) in August 2013. The estimated construction completion date is 2018.

- Nitrogen Removal Facilities (E900), which include 8 new denitrification reactors and two post aeration tanks. This project also includes construction of a carbon storage facility. Costs are based on bids received.

Schedule: This project is in construction with an estimated completion date in 2015.

- Centrate (Filtrate) Treatment Facilities (EE00), which will remove nitrogen from the recycle stream from solids processing. While the name of the project refers to centrate, refinement of this project after its initial inception resulted in sidestream filtrate treatment through the use of belt filter presses in place of centrifuges.

Schedule: The construction of this project was advertised for bid on October 6, 2013, and the construction of the facilities is anticipated to be completed in late 2016.

- Blue Plains Tunnel (EG00), which provides 73 million gallons of storage. Of this storage 31 million gallons will be provided to meet ENR requirements.

Schedule: This Blue Plains Tunnel is anticipated to be completed in 2015.

- Blue Plains Tunnel Dewatering Pumping Station (FR00), which will pump water stored in the Blue Plains Tunnel to the Blue Plains Plant for Complete Treatment after storm events have ceased. This project was combined with the Enhanced Clarification Facility (E800 above) as part of a design-build contract. Originally this pump station was planned for 170 MGD for wet weather mitigation. The capacity of this station was increased by 55 MGD to 225 MGD to meet the ENR requirements.

Schedule: Construction is anticipated to be completed in late 2018.

- Bolling Overflow Diversion Structure (FS00), which is designed to intercept and direct 521 MGD to the Blue Plains Tunnel. Costs are based upon the engineer's estimate.

Schedule: This project is in design with an estimated construction completion in 2018.

- Program Management (LM00), which includes program management services during planning, design, and construction of upgrades to ensure continued reliability of the facilities and compliance with the Plant's NPDES discharge permit. Program Management services are required for the ENR program due to the size and scope of the projects that comprise the program.
- Blue Plains Tunnel Site Prep (H701), which includes demolition of existing abandoned digesters to make way for the new dewatering pump station and the enhanced clarification facility (ECF). This location was necessary because these facilities would not fit elsewhere. Costs are based on bids received.

Schedule: This project has been completed.