WATER QUALITY ENHANCEMENT THROUGH STORMWATER BMPS, WETLAND AND NATURAL CHANNEL RESTORATION AND STABILIZATION

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The Pennsylvania Department of Transportation (PennDOT), District 6-0 is in the process of widening a seven-mile section (Section 300) of Route 202 in Chester County from four to six lanes, in a sprawling, suburban Philadelphia watershed. This project impacts a high quality, exceptional-value karst watershed that has experienced major land use alteration and development over the past 50 years. With a location along two high quality, exceptional value streams, protection of the watershed was of paramount concern as well as the ability to enhance recharge to the groundwater table and supplement stream base flow recharge.

The project consists of four (4) construction sections (310, 311, 320, 330). Section 310 is currently under construction, which includes stormwater infiltration berms, wetland replacement, and stream channel stabilization construction.

Stormwater Best Management Practices (BMPs) were developed to protect the watershed from highway and upstream runoff and accompanying pollutants. GTS designed a combination of several water quality treatment systems, including stormwater treatment ponds, stormwater treatment wetlands, and infiltration basins and berms. A stormwater committee, consisting of local, county, state, federal agency representatives and the watershed coalition, was created as a forum to review project stormwater and stream concerns.

Additional mitigation included natural stream channel design measures to stabilize and restore eroding, sediment producing stream reaches and the replacement of wetlands. The project includes wetland replacement and approximately 1500 feet of stream restoration/stabilization using natural stream channel and bioengineering designs at the site of the wetland replacement.

Wetland construction consists of replacing predominantly forested wetlands within a floodplain site along the Little Valley Creek. Approximately nine hundred (900) lineal feet of channel stabilization will be performed in concert with the wetland construction. Additional stream stabilization will occur within a local municipal park. Mainstream stabilization measures include rock cross vanes and deflectors to reduce bank shear stress. Four to six feet high channel banks will be excavated to create bankfull benches and stabilized with a vegetated rock toe and blanketed for erosion control purposes. A fisherman’s path is provided for improved accessibility. A series of channel diversion pump-arounds were incorporated into the design to accommodate construction in the “dry”, in coordination with the local conservation district. Construction is scheduled to begin this year.
Pennsylvania Department of Transportation District 6-0 has proposed to widen a seven-mile section of Route 202 in Chester County from four to six lanes. This project impacts a high quality, exceptional value, karst watershed that has experienced major land use alteration and development over the past 50 years. Located along Valley and Little Valley Creek, protection of the watershed and supplementing stream base flow recharge was of paramount concern.

Mitigation included natural stream channel design measures in order to stabilize and restore eroding, sediment producing streambank reaches, and the replacement of wetlands. A total of 1500 feet, at four (4) locations, of stream restoration/stabilization was completed using natural stream channel and bioengineering designs. Approximately 900 lineal feet of channel stabilization was performed in concert with the wetland construction. Additional stream stabilization helped to improve a nearby local municipal park.

Mainstream stabilization measures include the use of rock cross vanes and deflector vanes to reduce bank shear stress. Four to six feet high vertical channel banks were graded back to create bankfull benches then stabilized with a vegetated rock toe and blanketed for erosion control purposes. A fisherman’s path is provided for improved accessibility. A series of channel diversion pump-arounds were incorporated into the design to accommodate construction in the “dry”, in coordination with the local conservation district.

Ecology Park Stream Stabilization

Before

After