D4.0 CONSIDERATION OF CRITICAL CONDITIONS

Federal Regulations (40 CFR 130.7(1)) require TMDLs to consider critical conditions for streamflow, loading, and water quality parameters. The intent of this requirement is to ensure that the water quality in waterbodies are protected during periods when they are most vulnerable. Accordingly, the point source-related TMDLs for Neshaminy Creek and its tributaries were developed using critical, low-flow (i.e., 7Q10) conditions. During such periods, effluent discharges comprise over 90% of the total streamflow. Critical conditions for nutrient (i.e., phosphorus) loads were considered by determining WLAs based on maximum flows from dischargers specified in NPDES permits for each facility. At present, the cumulative discharged flow from all facilities is about 50% of the cumulative permitted maximum flow. Use of permitted maximum discharge flow in TMDL determination provides additional assurance that when design flows are reached, the water quality in affected streams will meet water quality criteria.

D5.0 CONSIDERATION OF SEASONAL VARIATIONS

Higher nutrient concentrations typically occur during the summer low-flow period. During this period, there is reduced stream capacity to assimilate point source discharges due to less streamflow available for dilution. Also, the activity of aquatic biota varies seasonally as a
function of streamflow and temperature, with greater impacts associated with warmer, low-flow conditions. Since biological activity was an important consideration in DEP’s original listing of the stream segments as impaired due to nutrients, attention to the summer low-flow period was critical. If the stream segments are protected during this critical period, then other periods of lower temperatures, less biological activity, and more assimilative stream capacity are assumed to be protected as well.

D6.0 REASONABLE ASSURANCE OF IMPLEMENTATION

Implementation of the waste load reductions (in conjunction with nutrient reductions associated with sediment TMDLs described in Section C) should achieve the loading reduction goals established in the nutrient TMDLs discussed in this section. The nutrient TMDLs and WLAs reported in this section are contingent upon the assumption that current phosphorus limits reflected in the NPDES permits for regulated facilities within the Neshaminy Creek watershed will be reduced during critical, low-flow periods. Specifically, it is recommended that effluent limits for phosphorus be set at 1.0 mg/l for NPDES facilities located in the watershed, and that this limit be set for current (i.e., “average”) flows for each facility as reflected in Table D3.6. It is further recommended that phosphorus limits be re-set to 0.8 mg/l when the flows for these facilities increases beyond the existing (i.e., “average”) flows shown in Table D3.6. Such reductions, it is believed, will help achieve stated water quality objectives in the watershed. In order to evaluate the effectiveness of the Neshaminy TMDL, the Southeast Regional Office of PADEP will conduct pre- and post-implementation monitoring at 6 to 8 selected sites on tributaries downstream from municipal point source dischargers. The monitoring will include periphyton standing crop analyses based on chlorophyll-a concentration per substrate surface area and diurnal dissolved oxygen measurements. An attempt will be made to standardize physical habitat between sites (3 or 4 transects per site in riffle habitat with 3 chlorophyll-a measurements per transect) and, with use of a spherical densiometer, keep all sites within a certain range of percent canopy cover. A reduction in phosphorus in the point source outfalls should bring about a reduction in periphyton standing crop and a dampening in diurnal DO swings.

New and expanded discharges will be required to meet the more stringent limit of 0.5 mg/L TP. This control strategy encourages the use of pollution prevention techniques designed to reduce the volume of point source discharges to the streams when growth occurs. Methods that limit additional flows, such as reducing inflow & infiltration, water conservation and re-use, land application, and others, provide environmentally sound ways to accommodate growth in the watershed and still achieve the benefits of improved water quality. Additional benefits may be realized by developing a pollutant trading program within the watershed.

D7.0 PUBLIC PARTICIPATION

Notice of the draft TMDLs will be published in the *PA Bulletin* and local newspapers with a 30-day comment period provided. A public meeting with watershed residents will be held to discuss the TMDLs. Notice of final TMDL approval will be posted on the Department website.
LITERATURE CITED


