



# pennsylvania

DEPARTMENT OF ENVIRONMENTAL PROTECTION

BUREAU OF WATER STANDARDS & FACILITY REGULATION

MEMO

**TO:** ALL Sewage Enforcement Officers (SEO)

**FROM:** John R. Diehl, P.G. *John Diehl, P.G.*  
Chief, Act 537 Management  
Bureau of Water Standards & Facility Regulation

**DATE:** August 1, 2011

**RE:** Ultraviolet disinfection on shallow limiting zones

This document clarifies ultraviolet (UV) disinfection requirements relative to onlot alternative systems. Per the Alternate Systems Guidance (ASG) (362-0300-007), an onlot sewage system absorption bed placed on a site exhibiting limiting zones less than 20 inches from the mineral soil surface (considered a shallow limiting zone) must employ UV disinfection. UV disinfection, however, is not required on sites exhibiting limiting zones greater than or equal to 20 inches from the mineral soil surface. Technology-specific requirements for UV disinfection are included in the Department's ASG and for onlot alternate technologies listed on the DEP website.

Central to the Act 537 program is the Department's obligation to assure the public health, safety, and welfare of the citizens of the Commonwealth and to prevent pollution of the waters of the Commonwealth from disposal of sewage. Of specific concern is the potential for pathogenic bacteria and viruses from sewage effluent to pollute shallow groundwater aquifers used as drinking water supplies.

The regulations described by Title 25, Pennsylvania Code, Chapter 73, Section 73.72 identifies bacteriological characteristics as a component of the design consideration. Other considerations stated in regulation include the effects of fecal coliform on groundwater and limitations of the disposal site relative to any identified limiting zone in terms of bacteriological characteristics. The regulations clearly address the protection of groundwater and surface water resources from fecal contamination. UV disinfection of sewage effluent therefore addresses concerns about potential infective viruses which may not be otherwise retained and destroyed in the soil layer.

Literature reviews from both pertinent scientific reports and from onlot alternate technology research conducted at Delaware Valley College provided evaluations which inconclusively supported the use of soils as the sole treatment mechanism for removal of fecal coliform. Reported data showed bacteriological counts for fecal coliform were inconsistent with depth. Further, field studies from experimental onlot systems largely did not account for varying soil types.

With regard to the use of UV disinfection on systems that utilize a shallow limiting zone absorption bed, there are currently three technologies listed in the ASG that meet this criterion. The Onlot Alternate Technology Listings included on DEP's website also provides siting requirements.

To summarize, the ASG describes the following performance and siting criteria applies to onlot alternate systems where UV disinfection is required:

- The system can produce an effluent equal to or better than 10 mg/l BOD/CBOD and 10 mg/l TSS as monthly averages.
- Consistent with Section 73.165, UV disinfection should reduce fecal coliform concentrations to less than 200/100ml.
- An at-grade system is appropriate. Sufficient soil profiles must be conducted to ensure that the soil profile under the area of the proposed system has a minimum vertical isolation distance greater than or equal to 10 inches of suitable soil to seasonal high water table or greater than or equal to 16 inches to rock formation.

The effective date for siting criteria for shallow limiting zone settings is reflected on individual onlot alternate technology classification listings posted on the DEP website. Please note that there have been no UV disinfection-related revisions to technologies listed in the ASG.

If you have any questions regarding the contents of this letter, please direct them to John Diehl at [Jdiehl@state.pa.us](mailto:Jdiehl@state.pa.us) or by telephone at 717.787.5017.