

R18-9-E310. 4.10 General Permit: Intermittent Sand Filter, Less Than 3000 Gallons Per Day Design Flow

- A. A 4.10 General Permit allows an intermittent sand filter receiving wastewater treated to a level equal to or better than that provided by a 4.02 General Permit septic tank.
1. Definition. For purposes of this Section, an “intermittent sand filter” means a treatment technology characterized by:
 - a. The pressurized delivery of pretreated wastewater to an engineered sand bed in a containment vessel equipped with an underdrain system or designed as a bottomless filter;
 - b. Delivered wastewater dispersed throughout the sand media by periodic doses from the delivery pump to maintain unsaturated flow conditions in the bed; and
 - c. Wastewater that is treated during passage through the media, collected by a bed underdrain chamber, and removed by pump or gravity to the disposal works, or wastewater that percolates downward directly into the native soil as part of a bottomless filter design.
 2. An applicant may use an intermittent sand filter if:
 - a. The native soil is excessively permeable,
 - b. There is little native soil overlying fractured or excessively permeable rock, or
 - c. Reduction in setback distances or minimum vertical separation is desired.
- B. Performance. An applicant shall ensure that:
1. An intermittent sand filter with underdrain system is designed on the basis that it produces treated wastewater that meets the following criteria:
 - a. TSS of 10 milligrams per liter, 30-day arithmetic mean;
 - b. BOD5 of 10 milligrams per liter, 30-day arithmetic mean;
 - c. Total nitrogen (as nitrogen) of 40 milligrams per liter, 5-month arithmetic mean; and
 - d. Total coliform level of 1000 (Log10 3) colony forming units per 100 milliliters, 95th percentile.
 2. An intermittent sand filter with a bottomless filter design is designed on the basis that the treated wastewater released to the native soil meets the following criteria:
 - a. TSS of 20 milligrams per liter, 30-day arithmetic mean;
 - b. BOD5 of 20 milligrams per liter, 30-day arithmetic mean;
 - c. Total nitrogen (as nitrogen) of 53 milligrams per liter, five-month arithmetic mean; and
 - d. Total coliform level of 100,000 (Log10 5) colony forming units per 100 milliliters, 95th percentile.
- C. Notice of Intent to Discharge. In addition to the Notice of Intent to Discharge requirements specified in R18-9-A301(B) and R18-9-A309(B), an applicant shall submit specifications for the media proposed for use in the intermittent sand filter.
- D. Design requirements. An applicant shall ensure that:
1. Pressurized wastewater delivery is from the septic tank or separate watertight chamber with a pump sized and controlled to deliver the pretreated wastewater to the top of the intermittent sand filter. The applicant shall ensure that the dosing rate is at least four doses per day and not more than 24 doses per day;
 2. The pressurized wastewater delivery system provides even distribution in the sand filter through good engineering practice. The applicant shall:
 - a. Specify all necessary controls, pipe, valves, orifices, filter cover materials, gravel, or other distribution media, and monitoring and servicing components in the design documents;
 - b. Ensure that the cover and topsoil is six to 12 inches in depth and graded to drain.
 3. The sand filter containment vessel is watertight, structurally sound, durable, and capable of withstanding stress from installation and operational service. Intermittent sand filter placement may be above grade, partially buried, or fully buried depending on site and service circumstances;
 4. Media used in the intermittent sand filter is mineral sand and that media is washed and conforms to “Standard Specification for Concrete Aggregates,” (C 33-99aE1), which is incorporated by reference in R18-9-E308(D)(2)(a);
 5. The sand media depth is a minimum of 24 inches with the top and bottom surfaces level and the maximum wastewater loading rate is 1.2 gallons per day per square foot of inlet surface at the rated daily design flow;
 6. The underdrain system:
 - a. Is within the containment vessel;
 - b. Supports the filter media and all overlying loads from the unsupported construction above the top surface of the sand media;
 - c. Has sufficient void volume above normal high level of the intermittent sand filter effluent to prevent saturation of the bottom of the sand media by a 24-hour power outage or pump malfunction; and
 - d. Includes necessary monitoring, inspection, and servicing features;

7. Inspection ports are installed in the distribution media and in the underdrain;
 8. The bottomless filter is designed similar to the underdrain system, except that the sand media is positioned on top of the native soil absorption surface. The applicant shall ensure that companion modifications are made that eliminate the containment vessel bottom and underdrain and relocate the underdrain inspection port to ensure reliable indication of the presence or absence of water saturation in the sand media;
 9. The native soil absorption system is designed to ensure that the linear loading rate does not exceed site disposal capability; and
 10. The bottomless sand filter discharge rate per unit area to the native soil does not exceed the adjusted soil application rate for the quality of wastewater specified in subsection (B)(2).
- E. Installation requirements. An applicant shall place the containment vessel, underdrain system, filter media, and pressurized wastewater distribution system in an excavation with adequate foundation and each layer installed to prevent differential settling and promote a uniform density throughout of 1.3 to 1.4 grams per cubic centimeter within the sand media.
- F. Operation and maintenance requirements. The applicant shall follow the applicable requirements specified in R18-9-A313.

Historical Note

New Section adopted by final rulemaking at 7 A.A.R. 235, effective January 1, 2001 (Supp. 00-4).