

**Pima County Department of Environmental Quality
Alternative Wastewater On-Site Residential Treatment System Checklist
for Engineers, Designers, and Site Evaluators**

per Arizona Administrative Code Title 18, Chapter 9

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

General Permit

- _____ Wastewater treated to a level equal to or better than that specified in R18-9-E302 (B).
- _____ Intermittent sand filter is characterized by:
 - The pressurized delivery of pretreated wastewater to an engineered sand bed in a containment vessel equipped with an under drain system or designed as a bottomless filter;
 - Delivered wastewater dispersed throughout the sand media by periodic doses from the delivery pump to maintain unsaturated flow conditions in the bed; and
 - Wastewater that is treated during passage through the media, collected by a bed under drain 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.
- _____ An intermittent sand filter may be used if:
 - The native soil is excessively permeable,
 - There is little native soil overlying fractured or excessively permeable rock, or
 - The applicant desires a reduction in setback distances or minimum vertical separation.

Performance

- _____ An intermittent sand filter with under drain system is designed so that it produces treated wastewater that meets the following criteria:
 - TSS of 10 milligrams per liter, 30-day arithmetic mean;
 - BOD₅ of 10 milligrams per liter, 30-day arithmetic mean;
 - Total nitrogen (as nitrogen) of 40 milligrams per liter, 5-month arithmetic mean; and
 - Total coliform level of 1000 (Log₁₀ 3) colony forming units per 100 milliliters, 95th percentile;or
- _____ An intermittent sand filter with a bottomless filter is designed so that it produces treated wastewater released to the native soil that meets the following criteria:
 - TSS of 20 milligrams per liter, 30-day arithmetic mean;
 - BOD₅ of 20 milligrams per liter, 30-day arithmetic mean;
 - Total nitrogen (as nitrogen) of 53 milligrams per liter, 5-month arithmetic mean; and
 - Total coliform level of 100,000 (Log₁₀ 5 colony forming units per 100 milliliters, 95th percentile.

Notice of Intent to Discharge

- _____ Meet the requirements specified in R18-9-A301 (B) and R18-9-A309 (B)
- _____ Submit specifications for the media proposed for use in the intermittent sand filter.

Design requirements

- _____ Meet the applicable requirements in R18-9-A312
- _____ 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.
 - ensure that the dosing rate is at least 4 doses per day and not more than 24 doses per day;
- _____ The pressurized wastewater delivery system provides even distribution in the sand filter through good engineering practice.
 - Specify all necessary controls, pipes, valves, orifices, filter cover materials, gravel, or other distribution media, and monitoring and servicing components in the design documents; and

- Ensure that the cover and topsoil is 6 to 12 inches in depth and graded to drain;
- _____ The sand filter containment vessel is watertight, structurally sound, durable, and capable of withstanding stress from installation and operational service.
- May place the intermittent sand filter above grade, partially buried, or fully buried depending on site and service circumstances;

_____ Media used in the intermittent sand filter is mineral sand and that the media is washed and conforms to “Standard Specification for Concrete Aggregates, C33-03,” which is incorporated by reference in R18-9-E308 (D) (2);

_____ The sand media depth is a minimum of 24 inches with the top and bottom surfaces level and the maximum wastewater loading rate is 1.0 gallons per day per square foot of inlet surface at the rated daily design flow;

_____ The under drain system:

- Is within the containment vessel;
- Supports the filter media and all overlying loads from the unsupported construction above the top surface of the sand media;
- Has sufficient void volume above the 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
- Includes necessary monitoring, inspection, and servicing features;

_____ Inspection ports are installed in the distribution media and in the under drain;

_____ The bottomless filter is designed similar to the under drain system, except that the sand media is positioned on top of the native soil absorption surface.

- Ensure that companion modifications are made that eliminate the containment vessel bottom and under drain and
- Relocate the under drain inspection port to ensure reliable indication of the presence or absence of water saturation in the sand media;

_____ The native soil absorption system is designed to ensure that the linear loading rate does not exceed site disposal capability; and

_____ The bottomless sand filter discharge rate per unit area to the native soil does not exceed the adjusted soil absorption rate for the quality of wastewater specified in subsection Performance.

Installation requirements

_____ Meet the applicable requirements in R18-9-A313 (A),

_____ Place the containment vessel, under drain 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.

Operation and maintenance requirements

_____ Follow the applicable requirements in R18-9-A313 (B).

Prepared by:

Date: