

**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-E317. 4.17 General Permit: Cap System, Less Than 3000 Gallons Per Day Design Flow

General Permit

- _____ Use a cap fill cover over a conventional trench disposal works receiving wastewater treated to a level equal to or better than that specified in R18-9-E302(B).
- _____ Cap system is characterized by:
 - A soil cap, consisting of engineered fill placed over a trench that is not as deep as a trench allowed by R18-9-E302; and
 - A design that compensates for reduced trench depth by maintaining and enhancing the infiltration of wastewater into native soil through the trench sidewalls.
- _____ A cap system may be used if:
 - There is little native soil overlying fractured or excessively permeable rock, or
 - A high water table does not allow the minimum vertical separation to be met by a system authorized by R18-9-E302.

Performance

- _____ Ensure that the design soil absorption rate and vertical separation complies with those for a trench, based on the following performance, unless additional pretreatment is provided:
 - TSS of 75 milligrams per liter, 30-day arithmetic mean;
 - BOD₅ of 150 milligrams per liter, 30-day arithmetic mean;
 - Total nitrogen (as nitrogen) of 53 milligrams per liter, five-month arithmetic mean; and
 - Total coliform level of 100,000,000 (Log₁₀ 8) colony forming units per 100 milliliters, 95th percentile.

Notice of Intent to Discharge

- _____ Meet the Notice of Intent to Discharge requirements in R18-9-A301(B) and R18-9-A309(B),
- _____ Submit specifications for the proposed cap fill material.

Design requirements

- _____ Meet the applicable requirements in R18-9-A312,
- _____ The soil texture from the natural grade to the depth of the layer or the water table that limits the soil for unsaturated wastewater flow is no finer than silty clay loam;
- _____ Cap fill material used is free of debris, stones, frozen clods, or ice, and is the same as or one soil group finer than that of the disposal site material,
 - except fill material finer than clay loam not be used as an additive;
- _____ Trench construction:
 - The trench bottom is at least 12 inches below the bottom of the disposal pipe and not more than 24 inches below the natural grade, and the trench bottom and disposal pipe are level;
 - The aggregate cover over the disposal pipe is 2 inches thick and the top of the aggregate cover is level and not more than 9 inches above the natural grade;
 - The cap fill cover above the top of the aggregate cover is at least 9 inches but not more than 18 inches thick.
 - The cap surface is protected to prevent erosion and sloped to route surface drainage around the ends of the trench; and
 - If the top of the aggregate is at or below the original ground surface, the cap surface has side

- slopes not more than one vertical to three horizontal; or
 - If the top of the aggregate is above the original ground surface, the horizontal extent of the finished fill edges is at least 10 feet beyond the nearest trench sidewall or endwall;
- The criteria for trench length, bottom width and spacing, and disposal pipe size is the same as that for the trench system prescribed in R18-9-E302;
- Permeable geotextile fabric is placed on the aggregate top, trench end, and sidewalls extending above natural grade;
- The native soil within the disposal site and the adjacent downgradient area to a 50-foot horizontal distance does not exceed a 12 percent slope if the top of the aggregate cover extends above the natural grade at any location along the trench length.
 - Ensure that the slope within the disposal site and the adjacent downgradient area to a 50-foot horizontal distance does not exceed 20 percent if the top of the aggregate cover does not extend above the natural grade;
- The fill material is compacted to a density of 90 percent of the native soil if the invert elevation of the disposal pipe is at or above the natural grade at any location along the trench length;
- At least one observation port is installed to the bottom of each cap fill trench;
- The effective absorption area for each trench is the sum of the trench bottom area and the sidewall area.
 - The height of the sidewall used for calculating the sidewall area is the vertical distance between the trench bottom and the lowest point of the natural land surface along the trench length; and
- If correction factors are used for soil absorption rate under R18-9-A312 (D)(3) and minimum vertical separation under R18-9-A312(E), additional wastewater pretreatment is provided.

Installation requirements

- _____ Meet the applicable requirements in R18-9-A313 (A),
- _____ Prepare the disposal site when high soil moisture is not present and equipment operations do not create platy soil conditions.
- _____ Plow or scarify the fill area to disrupt the vegetative mat while avoiding smearing,
- _____ Construct trenches as specified above,
- _____ Scarify the site and apply part of the cap fill to the fill area and blend the fill with the scarified native soil within the contact layers, and
- _____ Follow the construction design specified in the Construction Authorization issued under R18-9-A301 (D)(1)(c).

Operation and maintenance requirements

- _____ Meet the applicable requirements in R18-9-A313(B),
- _____ Inspect and repair the cap fill and other surface features as needed to ensure proper disposal function, proper drainage of surface water, and prevention of damaging loads on the cap.

Prepared by:	Date:
--------------	-------