

**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-E322. 4.22 General Permit: Subsurface Drip Irrigation Disposal,
Less Than 3000 Gallons Per Day Design Flow**

Performance

1. Treated wastewater meets:

_____ Performance Category A:
20 mg/l TSS and BOD₅ for 30-day arithmetic mean;
Total nitrogen (as nitrogen) of 53 mg/l, five-month arithmetic mean; and
Total coliform level of one colony forming unit per 100 milliliters, 95th percentile;

OR

_____ Performance Category B:
30 mg/l TSS and BOD₅ for 30-day arithmetic mean;
Total nitrogen (as nitrogen) of 53 milligrams per liter, five-month arithmetic mean; and
Total coliform level of 300,000 (Log₁₀ 5.5) colony forming units per 100 milliliters, 95th percentile; and

2. The subsurface drip irrigation works is designed to meet the following performance criteria:

_____ Prevention of ponding on the land surface, and
_____ Incorporation of a fail-safe wastewater control or operational process to prevent inadequately treated wastewater from being discharged.

Notice of Intent to Discharge

_____ Meets requirements in R18-9-A301(B), R18-9-A309(B), and R18-9-E304, and:
_____ Documentation of the pretreatment method to achieve Category A or B performance;
_____ Manufacturer's warranty;
_____ Initial filter and drip irrigation flushing settings;
_____ Site evapotranspiration calculations if used to reduce the size of the disposal works; and
_____ If supplemental irrigation water is introduced to the subsurface drip irrigation disposal works, an identification of the cross-connection controls, backflow controls, and supplemental water sources.

Design requirements

_____ Meets the applicable design requirements specified in R18-9-A312
_____ The design requirements of R18-9-E304 are followed, except that:
• reserve volume specified in R18-9-E304(D)(3)(a)(iv) in an oversized treatment tank or a supplemental storage tank, and
• Drip irrigation components and appurtenances are properly placed.
_____ Performance category A subsurface drip irrigation disposal works.
• Driplines and emitters are placed to prevent ponding on the land surface, and
• Cover material and placement depth follow manufacturer's requirements to prevent physical damage or ultraviolet degradation of components and appurtenances; or
_____ Performance category B subsurface drip irrigation disposal works.
• Driplines and emitters are placed at least 6 inches below the surface of the native soil;
• A cover of soil or engineered fill is placed on the surface of the native soil to achieve a total emitter burial depth of at least 12 inches;

- Cover material and placement depth follow manufacturer's requirements to prevent physical damage or ultraviolet degradation of components and appurtenances; and

- The drip irrigation disposal works is not used for irrigating food crops;

Wastewater is filtered upstream of the dripline emitters to remove particles 100 microns in size and larger;

A pressure regulator is provided or pressure compensating drip line is used;

Wastewater pipe is PVC Plastic Pipe, Schedules 40, 80, and 120 or HDPE and meets pressure requirements;

Flushing of the subsurface drip irrigation disposal works components is provided at a minimum velocity of 2 feet per second and piping and appurtenances allow the wastewater to be pumped in a line flushing mode of operation with discharge returned to the treatment system headworks;

Air vacuum release valves are installed;

Driplines are placed from 12 to 24 inches apart unless other configurations are allowed by the manufacturer's specifications;

Dripline installation and design requirements follow manufacturer's requirements;

The maximum length of a single dripline follows manufacturer's specifications to provide even distribution;

The dripline incorporates a herbicide to prevent root intrusion for at least 10 years;

The dripline incorporates a bactericide to reduce bacterial slime buildup;

Disinfection does not reduce the life of the bactericide or herbicide in the dripline;

Any return flow from a drip irrigation disposal works to the treatment works does not impair the treatment performance; and

When dripline installation is under subsection (E)(1)(b) or (c), backfill consists of the excavated soil or similar soil obtained from the site that is screened for removal of debris and rock larger than 1/2-inch;

Emitters are spaced no more than 2 feet apart; and

Emitters are designed to discharge from 0.5 to 1.5 gallons per hour;

A suitable backflow prevention system is installed if supplemental water for irrigation is introduced to the pumping system. The applicant shall not introduce supplemental water to the treatment works;

The drip irrigation disposal works is installed in soils classified as:

- Sandy clay loam, clay loam, silty clay loam, or finer with weak platy structure or in soil with a percolation rate from 45 to 120 minutes per inch;
- Sandy clay loam, clay loam, silty clay loam, or silt loam with massive structure or in soil with a percolation rate from 31 to 120 minutes per inch; and
- Other soils if an appropriate site-specific SAR is determined;

The minimum vertical separation distances are 1/2 of those specified in R18-9-A312(E)(2) if the design evapotranspiration rate during the wettest 30-day period of the year is 50 percent or more of design flow, except that the applicant shall not use a minimum vertical separation distance less than 1 foot;

In areas where freezing occurs, the irrigation system is protected as recommended by the manufacturer;

If drip irrigation components are used for a disposal works using a shaded trench constructed in native soil, the following requirements are met:

- The trench is between 12 and 24 inches wide;
- The trench bottom is between 12 and 30 inches below the original grade of native soil and level to within 2 inches per 100 feet of length;
- Two driplines are positioned in the bottom of the trench, not more than 4 inches from each sidewall;

- The trench with the positioned driplines is filled to a depth of 6 to 10 inches with decomposed granite or C-33 sand or a mixture of both, with mixture composition, if applicable, and placement specified on the construction drawing;
- A minimum of 8 inches of backfill is placed over the decomposed granite or C-33 sand fill to an elevation of 1 to 3 inches above the native soil finished grade;
- Observation ports are placed at both ends of each shaded trench to confirm the saturated wastewater level during operation; and
- A separation distance of 24 inches or more is maintained between the nearest sidewall of an adjacent trench;

_____ The soil absorption area used for design is calculated using:

- For a design that uses the shaded trench method described in subsection (D)(14), the bottom and sidewall area of the shaded trench not more than 4 square feet per linear foot of trench; or
- For all other designs, the number of emitters times an area for each emitter where the emitter area is a square centered on each emitter with the side dimension equal to the emitter separation distance selected by the designer in accordance with R18-9-E322(D)(9)(a), excluding all areas of overlap of adjacent squares.

Operation and maintenance requirements

- _____ In addition to the applicable requirements in R18-9-A313 (B) and R18-9-E304
- _____ Test any fail-safe wastewater control or operational process quarterly to ensure proper operation to prevent discharge of inadequately treated wastewater, and
- _____ Maintain the herbicidal and bacteriological capability of the drip irrigation disposal works.

Prepared by:

Date: