

**WAC 246-274-415 Design requirements—Irrigation field components—Tier 2 and Tier 3 greywater irrigation systems.** Greywater irrigation fields for Tier 2 and Tier 3 systems must be designed to meet the following requirements:

- (1) Calculation of the total irrigation area is based on:
  - (a) The operating capacity of the system; and
  - (b) Irrigation rates that are dependent on the plant factor and evapotranspiration rate.
- (2) The total irrigation area shall be determined by using the following equation:

$$\text{Irrigation area (square feet)} = \frac{\text{Greywater volume (gallons per week) divided by}}{\text{Evapotranspiration x Plant Factor x 0.62}}$$

Where:

- Evapotranspiration (ET) = The monthly average of May through September ET rates in inches divided by four, as determined by the Washington State University, *State of Washington Irrigation Guide*, 1985 (as amended 1990; 1992 for select western Washington crops), or weekly averages based on actual conditions;
- Plant Factor = 0 to 0.3 for low water use plants; 0.4 to 0.6 for average water use plants; and 0.7 to 1.0 for high water use plants;
- 0.62 = The conversion factor (from inches of ET to gallons per week)

(a) This formula includes a factor of 1 for irrigation efficiency based on subsurface irrigation evenly distributed.

(b) The Washington State University, *State of Washington Irrigation Guide*, is available from the Washington state department of health's website.

(c) The person designing the system may demonstrate to the satisfaction of the local health officer that adjustments to the values identified in this subsection are appropriate based on:

- (i) Professional judgment; and
- (ii) Applicable reference materials considering relevant factors such as water requirements of plants, density of plantings, microclimates of the site, irrigation efficiency of the system, and soil conditions.

(3) Irrigation rates must not exceed maximum allowable soil loading rates in Table II based on the finest textured soil in the lower twenty-four inches of suitable soil. The soil loading rate in Table II may be increased up to a factor of 2 for soil types 1-4 and up to a factor of 1.5 for soil types 5 and 6 when a treatment technology that meets the requirements of WAC 246-274-400 is used.

**Table II  
Soil Type Description and Maximum Hydraulic Loading Rate**

Soil Type	Soil Textural Classification Description	Loading Rate for Greywater gal./sq. ft./day
<b>1</b>	Gravelly and very gravelly coarse sands, all extremely gravelly soils excluding soil types 5 and 6, all soil types with greater than or equal to 90% rock fragments.	Not suitable without augmentation 1.0 with augmentation
<b>2</b>	Coarse sands.	Not suitable without augmentation 1.0 with augmentation
<b>3</b>	Medium sands, loamy coarse sands, loamy medium sands.	0.8

Soil Type	Soil Textural Classification Description	Loading Rate for Greywater gal./sq. ft./day
4	Fine sands, loamy fine sands, sandy loams, loams.	0.6
5	Very fine sands, loamy very fine sands; or silt loams, sandy clay loams, clay loams, and silty clay loams with a moderate structure or strong structure (excluding a platy structure).	0.4
6	Other silt loams, sandy clay loams, clay loams, silty clay loams.	0.2
7	Sandy clay, clay, silty clay, and strongly cemented firm soils, soil with a moderate or strong platy structure, any soil with a massive structure, any soil with appreciable amounts of expanding clays.	Not suitable

(4) The subsurface irrigation components of the greywater irrigation system must be installed in suitable soil. The suitable soil may consist of original, undisturbed soil or original soil that is augmented.

(5) The subsurface irrigation components of the greywater irrigation system must be installed a minimum of four inches deep and no deeper than twelve inches below the finished grade. The four-inch cover layer must consist of two inches of suitable soil and two inches of mulch.

(6) There must be a minimum of twenty-four inches of suitable soil between the subsurface irrigation components of the greywater irrigation system and any restrictive layer or the highest water table during the growing season.

(7) If the original soil is augmented, the mixture used for augmentation must meet the following criteria to ensure that suitable soil is used:

(a) The mixture must have an organic content that is at least five percent to support plant life and increase soil structure, and no greater than ten percent to prevent excessive decomposition;

(b) The mixture must be a well blended mix of mineral aggregate (soil) and compost where the soil ratio depends on the requirements for the plant species; and

(c) The mineral aggregate must have the following gradation:

Sieve Size	Percent Passing
3/8	100
No. 4	95 - 100
No. 10	75 - 90
No. 40	25 - 40
No. 100	4 - 10
No. 200	2 - 5

(8) If native soil is augmented, the additional soil must be tilled into the native soil a minimum of four inches.

(9) Soil types 1 and 2 must be augmented before use. Soil type 7 is not suitable for subsurface irrigation.

(10) The irrigation field may only be located on slopes of less than thirty percent, or seventeen degrees.

(11) Irrigation scheduling should incorporate the use of adjustment features so that application rates are closely matched with soil and weather conditions.

[Statutory Authority: RCW 90.46.015. WSR 11-02-011, § 246-274-415, filed 12/28/10, effective 7/31/11.]