

**COMMENTS AND SUGGESTED AMENDMENTS TO HCD'S CHAPTER 16A,
Part I, ENTITLED NONPOTABLE WATER REUSE SYSTEMS
15-DAY VERSION**

HCD has recently made some minor amendments to the original proposed language and published the amended standards for public comments. The deadline to submit comments is December 9, 2009.

The changes made to the standards are basically:

- 1) To only allow clothes washer graywater systems to be constructed without a permit, provided no work is done on the existing plumbing piping; and eliminating the definition of a "single fixtures"; and
- 2) To require that indoor use of graywater be subject to the installation and testing requirements of Part II of Chapter 16.

The changes did not go far enough to alleviate our concerns and we still believe that most of the previous suggested changes should be considered and implemented. Although CBSC regulations require that we only comment on the amendments, we do not believe that HCD fulfilled their obligation to respond to all previous comments received, as also required by CBSC regulations.

Summary of our most important changes:

1. Require 9" burial depth instead of 2"
2. Require 5' clearance to ground water instead of 3'
3. Require 5' clearance to property line and to water lines instead of 1.5' and 0', respectively
4. Percolation tests should maintain the model code requirements for maximum and minimum percolation rates.
5. Require that quality of recycled water used indoors be maintained through annual testing and reporting
6. We still believe that a permit should be required for all installations, including clothes washers; however, we suggest using the specific provisions in the standards that allow local jurisdictions to change these provisions to require a permit.

Suggested amendments are shown as ~~double strike through~~ or **bold and double underlined**

1601A.0(B)

Comment: Since a tank is optional, a tank should be required when the graywater system cannot handle the entire discharge and the system would rely on discharging the excess effluent to the sewer. The tank capacity should not exceed the maximum flow that could be handled or absorbed by the site soil.

The section should read as follows:

- (B) The type of system shall be determined by the location, discharge capacity, soil type, and ground water level. The system shall be designed to handle graywater discharged from the building and may include tank(s) and other appurtenances necessary to ensure proper function of the system.

*Note: It is not the intent of this section to require that all graywater must be handled by an irrigation field or disposal field. It is acceptable for excess graywater to be diverted to the building sewer through the overflow required pursuant to Section 1609A.0 (E). **In this case, a tank shall be required. The tank shall have a maximum capacity that could be handled by the site soil and shall be equipped with an overflow connected to the building drain or sewer.***

Section 1601A.0(H)

Comment: To allow the discharge point of a graywater systems to have only 2" cover (instead of model code 10") could represent a public health, nuisance and safety problems to occupants and surrounding property owners, as effluent could surface, especially when piping could be constructed above ground and covered with mulch (see subsection 7 of Section 1603A1.1). Suggested amendment: Change 2" to 9" (as provided for in Appendix G-A of the 2001 California Plumbing Code)

The section should read as follows:

- (H) Human contact with graywater or the soil irrigated by graywater shall be minimized and avoided, except as required to maintain the graywater system. The discharge point of any graywater irrigation or disposal field shall be covered by at least **(2 9)** inches (~~64~~ **229** mm) of mulch, rock, or soil, ~~or a solid shield~~ to minimize the possibility of human contact.

Section 1604A.1

Comment: The reasoning used to reduce clearance to ground water is: "The California State Water Resources Control Board (CSWRCB) is now in the process of developing regulations for on-site wastewater disposal systems (septic system). At this time, the proposed regulations call for three (3) feet separation to high ground water. This requirement is less stringent than the model code graywater standard that requires five (5) feet separation to high ground water. This change was necessary to remove the conflict between the graywater standards and the CSWRCB's programs."

Before such change is implemented, we should ensure that CSWRC would go through with the change. The distance to groundwater is important to ensure that the effluent will be filtered before entering the ground water stream that could be used for drinking. If the soil is of a type that allows the effluent to pass through quickly (sandy soil) the effluent will not have sufficient time/filtration to rid it from contaminants. Therefore, it is possible for CSWRCB to maintain the 5' requirement. Suggested Amendments: Change 3' to 5'.

The section should read as follows:

1604A.1 Groundwater Depth. Verification of ground water levels which exceed **five three (3 5)** vertical feet (~~945~~ **1524** mm) from the deepest irrigation or disposal point of the proposed graywater system shall not be required.

Note: The absence of groundwater in a test hole **three five (3 5)** vertical feet (~~945~~ **1524** mm) below the deepest irrigation or disposal point shall be sufficient to satisfy this section unless seasonal high groundwater levels have been documented to rise to within this area.

Section 1607A.0

Comment: Graywater should not be discharged within 5' of ground water.

The section should read as follows:

1607A.0 Required Area of Irrigation or Disposal Fields Irrigation or disposal fields may have one or more valved zones. Each zone must be of adequate size to receive the graywater anticipated in that zone. No irrigation or disposal field shall extend within ~~three five (3 5)~~ vertical feet (~~915 1524~~ mm) of the highest known seasonal groundwater, or to a depth where graywater contaminates the groundwater, ocean water or surface water. The applicant shall supply evidence of groundwater depth to the satisfaction of the Enforcing Agency.

Note: The absence of groundwater in a test hole ~~three five (3 5)~~ vertical feet (~~915 1524~~ mm) below the deepest irrigation or disposal point shall be sufficient to satisfy this section unless seasonal high groundwater levels have been documented to rise to within this area.

Section 1608A.0 (C)

Comment: The amendment has very general language and does not provide for specific limitations on soil absorption levels. The stricken model code language not only specifies the minimum absorption levels of a soil so as effluent will not surface, but also specifies the maximum absorption levels (very porous soil) to ensure that effluent will have sufficient time and is filtered to an adequate level before it reaches ground water. Suggested amendment: keep model code language.

The section should read as follows:

(C) When a percolation test is required, no graywater system shall be permitted if the test shows the absorption capacity of the soil is less than eighty-three hundredths (0.83) of a gallon per square foot (33.8 L/m²) or more than five and twelve-hundredths (5.12) of a gallon per square foot (208.5 L/m²) of leaching area per twenty-four (24) hours ~~unable to accommodate the intended discharge of the proposed graywater system.~~

Exception: The Enforcing Agency may waive the requirement for percolation tests based on knowledge of local conditions or accept other testing methods.

Section 1611A.2

Comment: The word "approved" should be inserted in this section to ensure that the Enforcement Agency will be allowed to review and approve the alternate. Also, subsection (5) is to be changed to require 9 inches of cover.

The section should read as follows:

1611A.2 Irrigation Field. The provisions of this section are not intended to prevent the use of any appropriate material, appliance, installation, device, design or method of construction. If an approved alternate design is not available, the following provisions may be used as guidance in the design of a graywater irrigation field:

The remainder of the section should remain the same except for subsection (5) to read as follows:

(5) All drip irrigation supply lines shall be polyethylene tubing or PVC Class 200 pipe or better and Schedule 40 fittings. All joints shall be properly solvent-cemented, inspected and pressure tested at 40 psi (276 kPa), and shown to be drip tight for five minutes, before burial. All supply piping shall be covered to a minimum depth of two (2 9) inches (~~54 229~~ mm) of mulch or soil. Drip feeder lines can be poly or flexible PVC tubing and shall be covered to a minimum depth of ~~two (2 9)~~ inches (~~54 229~~ mm) of mulch or soil.

Section 1611A.3

Comment: The word “approved” should be inserted in this section to ensure that the Enforcement Agency will be allowed to review and approve the alternate.

The section should read as follows:

1611A.3 Disposal Field. The provisions of this section are not intended to prevent the use of any appropriate material, appliance, installation, device, design or method of construction. If an approved alternate design is not available the following provisions may be used as guidance in the design of a graywater disposal field: (The remainder of the section to remain the same)

Section 1611A.3 (C)

Comment: Depth of earth cover of lines should be maintained at 9”. See comment for Section 1601A.0 (H) above.

The section should read as follows:

(C) *Disposal* fields shall be constructed as follows:

(See chart below)

| | Minimum | Maximum |
|---|---|------------------------|
| Number of drain lines per valved zone [†] | 1 | — |
| Length of each perforated line [†] | — | 100 ft. (30,840 mm) |
| Bottom width of trench [†] | 12 in. (305 mm) | 24 in. (610 mm) |
| Spacing of lines, center to center [†] | 4 ft. (1219 mm) | — |
| Depth of earth cover of lines | 2 in. (51 mm) 9” (230 mm) | — |
| Depth of filter material cover of lines | 2 in. (51 mm) | — |
| Depth of filter material beneath lines [†] | 3 in. (76 mm) | — |
| Grade of perforated lines | level | 3 in./100 ft. (2 mm/m) |

[†] *Manufactured leaching chambers shall be installed in compliance with the manufacturer’s installation instructions.*

Table 16A-1

Comment: Justification should be provided for reducing the distance between irrigation fields and private property lines from 5’ to 1.5’.

Also, justification should be provided for reducing distance between irrigation and disposal fields to onsite domestic water lines from 5’ to 0’.

Otherwise, model code distances should be maintained.

In addition, the proposed amendment reverses the model code language defining building structures as that including porches, steps... etc. The proposal indicates that building structures does not include any of these mentioned under note #1. Justification should be provided or model code language should be maintained.

The Table should read as follows:

Table 16A -1 Location of Graywater System

| Minimum Horizontal Distance Required From: | Tank | Irrigation Field | Disposal Field |
|---|---------------------------|---|--|
| | Feet/mm | Feet/mm | Feet/mm |
| Building structures ¹ | 5 (1,524 mm) ² | 2 (610 mm) | 5 (1,524 mm) |
| Property line adjoining private property | 5 (1,524 mm) | 1.5 feet (458 mm) 5 (1,524 mm) | 5 (1,524 mm) |
| Water supply wells ³ | 50 (15,240 mm) | 100 (30,480 mm) | 100 (30,480 mm) |
| Streams and lakes ³ | 50 (15,240 mm) | 100 (30,480 mm) ^{4,5} | 100 (30,480 mm) ⁴ |
| Sewage pits or cesspools | 5 (1,524 mm) | 5 (1,524 mm) | 5 (1,524 mm) |
| Sewage disposal field | 5 (1,524 mm) | 4 (1,219 mm) ⁶ | 4 (1,219 mm) ⁶ |
| Septic tank | 0 (0) | 5 (1,524 mm) | 5 (1,524 mm) |
| Onsite domestic water service line | 5 (1,524 mm) | 0 (0 mm) 5 (1,524 mm) | 0 (0 mm) 5 (1,524 mm) |
| Pressurized public water main | 10 (3,048 mm) | 10 (3,048 mm) ⁷ | 10 (3,048 mm) ⁷ |

¹ Building structures ~~does not~~ include porches and steps, whether covered or uncovered, breezeways, roofed porte cocheres, roofed patios, carports, covered walks, covered driveways, and similar structures or appurtenances.

² Underground tanks shall not be located within a 45 degree angle from the bottom of the foundation, or they shall be designed to address the surcharge imposed by the structure. The distance may be reduced to six (6) inches (153 mm) for aboveground tanks when first approved by the Enforcing Agency.

³ Where special hazards are involved, the distance required shall be increased as directed by the Enforcing Agency.

⁴ These minimum clear horizontal distances shall also apply between the irrigation or disposal field and the ocean mean higher hightide line.

⁵ The minimum horizontal distances may be reduced to 50 feet (15,240 mm) for irrigation fields utilizing graywater which has been filtered prior to entering distribution piping.

⁶ Plus two (2) feet (610 mm) for each additional foot of depth in excess of one (1) foot (305 mm) below the bottom of the drain line.

⁷ For parallel construction or crossings, approval by the Enforcing Agency shall be required.

Section 1612A.1

Comment: This section allows the use of Graywater if treated to a disinfected tertiary state, but allows on-site water treatment systems. To ensure the continued discharge quality that would meet the California standards for tertiary water, it is proposed that an annual test be performed on the discharge of the on-site plant by a certified laboratory with the results submitted to the Enforcement Agency to certify the quality of the discharge.

The section should read as follows:

1612A.1 Indoor Use of Graywater. [HCD 1]

Graywater shall not be allowed for indoor use, such as flushing toilets and urinals, unless treated by an on-site water treatment system approved by the Enforcing Agency. For the purposes of this section, graywater treated by an on-site water treatment system shall be considered "Treated Graywater." Treated graywater and treated graywater systems shall comply with the provisions of this code except as otherwise provided in this chapter and all of the following:

- (1) The treated graywater shall have a separate tank sized to minimize the length of time it is retained.
- (2) A maintenance and operation manual for the treatment system shall be kept at the location of the system.

(3) Treated graywater intended for use indoors shall meet the California Department of Public Health statewide uniform criteria for disinfected tertiary recycled water as provided in: California Code of Regulations Title 22 Section 60301.230.

(4) The treated graywater system shall be installed, inspected and tested as specified for recycled water systems in Sections 1618A.0 and 1620A.0.

(5) The owner of the premise shall be responsible to submit an annual report to the Enforcement Agency prepared by an approved certified laboratory showing that testing has been performed on the on-site water treatment system and that the quality of the discharge is within the parameters of the State's disinfected tertiary recycled water quality.

Fady Mattar, PE, CBO
12/3/2009
(714) 788-0593 (C)