NOTICES OF PROPOSED RULEMAKING

Unless exempted by A.R.S. § 41-1005, each agency shall begin the rulemaking process by 1st submitting to the Secretary of State's Office a Notice of Rulemaking Docket Opening followed by a Notice of Proposed Rulemaking that contains the preamble and the full text of the rules. The Secretary of State's Office publishes each Notice in the next available issue of the *Register* according to the schedule of deadlines for *Register* publication. Due to time restraints, the Secretary of State's Office will no longer edit the text of proposed rules. We will continue to make numbering and labeling changes as necessary.

Under the Administrative Procedure Act (A.R.S. § 41-1001 et seq.), an agency must allow at least 30 days to elapse after the publication of the Notice of Proposed Rulemaking in the *Register* before beginning any proceedings for adoption, amendment, or repeal of any rule. A.R.S. §§ 41-1013 and 41-1022.

NOTICE OF PROPOSED RULEMAKING

TITLE 4. PROFESSIONS AND OCCUPATIONS

CHAPTER 48. ARIZONA UNIFORM PLUMBING CODE COMMISSION

PREAMBLE

1. **Sections Affected** / **Rulemaking Action**

R4-48-125	New Section
Table A	New Table
Table B	New Table
Table C	New Table
Illustration A	New Illustration
Illustration B	New Illustration
Illustration C	New Illustration
Illustration D	New Illustration
Illustration E	New Illustration

2. **The specific authority for the rulemaking, including both the authorizing statute (general) and the statutes the rules are implementing (specific):**

   Authorizing statute: A.R.S. § 41-619

   Implementing statute: A.R.S. § 41-619

3. **A list of all previous notices appearing in the Register addressing the proposed rule:**

   Notice of Rulemaking Docket Opening: 5 A.A.R. 1445, May 14, 1999

4. **The name and address of agency personnel with whom persons may communicate regarding the rulemaking:**

   Name: A. Hal Key, P.E., Chairperson

   Address: Arizona Uniform Plumbing Code Commission
   c/o Arizona Registrar of Contractors
   800 West Washington, 6th Floor
   Phoenix, Arizona 85007

   Telephone: (602) 542-1525, Ext. 7105

   Fax: (602) 542-1536

5. **An explanation of the rule, including the agency's reasons for initiating the rule:**

   The Arizona Uniform Plumbing Code Commission is initiating this rule as directed by the Governor's Regulatory Review Council. Appendix G was initially part of R4-48-102, but the GRRC Council felt it was incomplete and needed to be reviewed jointly by the Commission and the Arizona Department of Environmental Quality since the Appendix in question is associated with an issue currently handled by ADEQ. The changes made herein are an agreement reached between the Commission and ADEQ to regulate graywater systems in the state of Arizona and to pro-

tect the health, safety and welfare of its citizens.

6. A reference to any study that the agency proposes to rely on in its evaluation of or justification for the proposed rule and where the public may obtain or review the study, all data underlying each study, any analysis of the study and other supporting material:

None.

7. A showing of good cause why the rule is necessary to promote a statewide interest if the rule will diminish a previous grant of authority of a political subdivision of this state:

Not applicable.

8. The preliminary summary of the economic, small business, and consumer impact:

Generally speaking, the changes to Appendix G may require larger lot sizes, may preclude the use of graywater systems on some lots, provide for additional, and perhaps more restrictive, specifications on the design and construction of graywater systems, and will require additional inspections of graywater systems during their design and construction. These changes, therefore, may impose some economic costs. However, since these changes were made to decrease the environmental and health risks of graywater systems, the economic costs will be offset by the economic benefits of the reduced risks.

9. The name and address of agency personnel with whom persons may communicate regarding the accuracy of the economic, small business, and consumer impact statement:

Name:	A. Hal Key, P.E., Chairperson
Address:	Arizona Uniform Plumbing Code Commission c/o Arizona Registrar of Contractors 800 West Washington, 6th Floor Phoenix, Arizona 85007
Telephone:	(602) 542-1525, Ext. 7105
Fax:	(602) 542-1536

10. The time, place, and nature of the proceedings for the adoption, amendment, or repeal of the rule or, if no proceeding is scheduled, where, when, and how persons may request an oral proceeding on the proposed rule:

Date:	Tuesday, June 29, 1999
Time:	9 a.m.
Location:	Industrial Commission Building Auditorium 800 West Washington, First Floor Phoenix, Arizona
Nature:	Public Hearing

Date:	Tuesday, June 29, 1999
Time:	9 a.m.
Location:	State Office Complex 400 West Congress, Room 222 Tucson, Arizona
Nature:	Public Hearing

Date:	Tuesday, June 29, 1999
Time:	9 a.m.
Location:	Registrar of Contractors 2708 North 4th Street, Suite C1 Flagstaff, Arizona
Nature:	Public Hearing

11. Any other matters prescribed by statute that are applicable to the specific agency or to any specific rule or class of rules:

None.

12. Incorporations by reference and their location in the rules:

Appendix G of the I.A.P.M.O. 1994 Uniform Plumbing CodeR4-48-125(A)

13. The full text of the rules follows:

TITLE 4. PROFESSIONS AND OCCUPATIONS

CHAPTER 48. ARIZONA UNIFORM PLUMBING CODE COMMISSION

ARTICLE 1. ARIZONA UNIFORM PLUMBING CODE

Sections

R4-48-125. Graywater Systems for Single Family Dwellings
Table A. Irrigation Disposal Fields
Table B. Location of Graywater System and Setback Requirements
Table C. Effluent Application Loading Rates to Soil for Graywater Systems
Illustration A. Graywater System Tank – Gravity
Illustration B. Graywater System Tank – Pumped
Illustration C. Graywater System Multiple Tank Installation
Illustration D. Graywater System Underground Tank – Pumped
Illustration E. Graywater System Typical Irrigation Zone Layout

ARTICLE 1. ARIZONA UNIFORM PLUMBING CODE

R4-48-125. Appendix G, Graywater Systems for Single Family Dwellings.

A. Appendix G of the International Association of Plumbing and Mechanical Officials' (I.A.P.M.O.) Uniform Plumbing Code (1994 Edition) is incorporated by reference. This incorporation by reference does not include any later amendments or editions. Copies of the incorporated material are available from I.A.P.M.O. at 20001 Walnut Drive South, Walnut, CA, 91789-2825 and are on file with the Arizona Uniform Plumbing Code Commission and the Office of the Secretary of State.

B. Appendix G, incorporated by subsection (A) is modified as follows:

1. Appendix G 1 (b) is modified to read: "The type of system shall be determined on the basis of location, soil type, soil classification per American Society Testing and Materials (ASTM) D-5921-96, and depth to ground water below the land surface, and shall be designed to accept only graywater connected to the system from the residential building. The system, except as otherwise approved, shall consist of a holding tank or tanks and shall discharge graywater into subsurface irrigation/disposal fields."
2. Appendix G 1 (d) is modified to read: "No permit for any graywater system shall be issued until a plot plan with appropriate data, as required by Section G4, has been submitted and approved. When there is insufficient lot area or inappropriate soil conditions for adequate absorption of the graywater, as determined by the Administrative Authority, no graywater system shall be permitted. No permit shall be issued for the irrigation/disposal field of a graywater system that does not meet the criteria specified herein until appropriate data satisfactory to the Administrative Authority has been submitted and approved."
3. Appendix G 1 (g) is added to read: "When making the initial site investigation and determining the soil characterization and soil absorption rates for graywater systems, the following ASTM standards, herein incorporated by reference, shall be used:
   a. ASTM D-5879-95, "Standard Practice for Surface Site Characterization for On-Site Septic Systems;"
   b. ASTM D-5921-96, "Standard Practice for Subsurface Site Characterization of Test Pits for On-Site Septic Systems;" and
   c. ASTM D-1452-80 (1990) e1, "Standard Practice for Soil Investigation and Sampling by Auger Borings," shall be used in areas where the depth to groundwater may be within the required vertical separation from the bottom of the subsurface disposal field for graywater systems."
4. Appendix G 2 is modified to read: "Graywater is untreated household water which has not come into contact with toilet waste. Graywater includes used water from bathtubs, showers, bathroom wash basins, and water from clothes-washing machines and laundry tubs. It shall not include wastewater from kitchen sinks, dishwashers, or deleterious chemicals such as discharge from photo lab sinks."

5. Appendix G 4 (a) is modified to read: "A site specific plot plan drawn to scale completely dimensioned, showing lot lines and structures, direction and approximate slope of surface (2 foot (0.6 m) contour lines), location of all present or proposed retaining walls, drainage channels, water supply lines, wells, paved areas and structures on the plot, number of bedrooms and plumbing fixtures in each structure, location of private sewage disposal system and 100% expansion area, or building sewer connection to the public sewer, and location of the proposed graywater system."
6. Appendix G 4 (b) is modified to read: "Details of construction including system profile and construction sections necessary to assure compliance with the requirements of this Appendix, together with a full description of the complete installation, including installation methods, construction and materials as required by the Administrative Authority."
7. Appendix G 4 (c) is modified to read: "A log of soil formations, percentage of rock, texture, structure, consistence, and mottles as provided in ASTM D-5921-96 and depth to ground water below the land surface as determined by test holes dug in close proximity to any proposed irrigated area and soil classification. The Administrative Authority may require an additional determination of water absorption characteristics of the soil at the proposed site by approved percolation tests or by alternate means to determine equivalent function of subsurface/disposal field."
8. Appendix G 5 (a) (1) is modified to read: "All applicable provisions of this Appendix and the inspection requirements shall be complied with. The Administrative Authority shall confirm the soil suitability for a graywater system, inspect the disposal area following excavation, and inspect the piping system installation."
9. Appendix G 5 (a) (3) is modified to read: "Holding/surge tanks shall be installed on dry, level, well-compacted soil if underground, or on a level three (3) (76.2 mm) concrete slab if above ground."
10. Appendix G 5 (a) (4) is modified to read: "Above ground holding/surge tanks of cylindrical design shall be anchored against overturning."
11. Appendix G 5 (b) (1) is modified to read: "Holding/surge tanks shall be filled with water to the overflow line prior to and during inspection. All seams and joints shall be left exposed and the tank shall remain watertight."
12. Appendix G 5 (b) (2) is modified to read: "A flow test shall be performed through the system to the point of graywater irrigation/disposal. All conveyance lines and components shall be watertight."
13. Appendix G 7 is modified to read: "Each irrigation zone shall have the minimum effective irrigation area in square feet as determined by Table G-2 for the type of soil found in the excavation, based upon a calculation of estimated graywater discharge pursuant to Section G-6 of this Appendix. The effective area of the irrigation/disposal zone shall be equal to the aggregate length of the perforated pipe sections within the irrigation zone times the width of the proposed irrigation/disposal zone. Each proposed graywater system shall include at least one (1) irrigation zone. Each zone shall be in compliance with the provisions of this section. No excavation for an irrigation/disposal field shall extend to a depth where graywater may contaminate the groundwater or surface water. The minimum vertical separation distance from the bottom of the irrigation zone shall be at least one (1) foot (0.30 m) of normally unsaturated soil."
14. Appendix G 8 (a) is modified to read: "Irrigation/disposal field size shall be computed from Table G-2. Rock fragments as defined by ASTM D-5921-96 shall be excluded from the field sizing."
15. Appendix G 8 (c) is modified to read: "When a percolation test is required, no graywater system may be permitted if the test shows the absorption capacity of the soil outside the range of two (2) minutes per inch (0.79 minutes per cm) to sixty (60) minutes per inch (23.6 minutes per cm). Soils with excessively high or low permeability are unsuitable."
16. Appendix G 9 is modified to read: "Holding/Surge Tank Construction"
17. Appendix G 9 (a) is modified to read: "Plans for holding/surge tanks, if utilized, shall be submitted to the Administrative Authority for approval. Such plans shall show all dimensions and such other pertinent data as may be required. A minimum capacity of fifty (50) gallons (189.2 L) is required, when a holding/surge tank is utilized."
18. Appendix G 9 (b) is modified to read: "Holding/surge tanks shall be constructed of sold durable materials, not subject to excessive corrosion or decay, and shall be watertight."
19. Appendix G 9 (c) is modified to read: "Each holding/surge tank shall be vented as required by Chapter 9 of this Code and shall have a locking, gasketed access opening, or approved equivalent, to allow for inspections and cleaning."
20. Appendix G 9 (d) is modified to read: "Each holding/surge tank shall have its rated capacity permanently marked on the unit. In addition, a sign "GRAYWATER IRRIGATION SYSTEM, DANGER – UNSAFE WATER" shall be permanently marked on the holding/surge tank."
21. Appendix G 9 (e) is modified to read: "Each holding/surge tank installed above ground shall have an emergency drain, separate from that connecting the tank with the irrigation/disposal fields, and an overflow drain. The emergency and overflow drains shall have permanent connections to the building drain or building sewer, upstream of the septic tanks, if any. The overflow drain shall not be equipped with a shutoff valve."
22. Appendix G 9 (f) is modified to read: "The overflow and emergency drain pipes shall not be less in size than that of the inlet pipe. The vent size shall be determined based on the total graywater fixture units, as outlined in Table 7-5 of this Code. Unions or equal effective fittings shall be provided for all piping connected to the holding/surge tank."
23. Appendix G 9 (g) is modified to read: "Each holding/surge tank shall be structurally designed to withstand all anticipated earth or other loads. All holding/surge tank covers shall be capable of supporting an earth load of not less than three hundred (300) pounds per square foot (14.4 kPa) when the tank is designed for underground installation."

24. Appendix G 9 (h) is modified to read: "If a holding/surge tank is installed underground, the system must be designed so that the tank overflow will gravity drain to the existing sewer line, septic tank. The tank shall be protected against sewer line backflow by a backwater valve."
25. Appendix G 9 (i) (1) is modified to read: "Steel holding/surge tanks shall be protected from corrosion, both externally and internally, by a coating acceptable by the Administrative Authority."
26. Appendix G 9 (i) (2) is modified to read: "Holding/surge tanks constructed of concrete, fiberglass or alternative material may be approved by the Administrative Authority."
27. Appendix G 10 is modified to read: "Graywater piping discharging into the holding/surge tank or having a direct connection to the sanitary drain or sewer piping shall be downstream of an approved waterseal type trap(s). If no such trap(s) exists, an approved vented running trap shall be installed upstream of the connection to protect the building from any possible waste or sewer gasses. All graywater piping shall be marked or shall have a continuous tape marked with the words "DANGER – UNSAFE WATER." All valves, including the three-way valve, shall be readily accessible and shall be approved by the Administrative Authority. A backwater valve, installed pursuant to this Code, shall be provided on all holding/surge tank drain connections to the sanitary drain or sewer piping."
28. Appendix G 11 (b) is modified to read: "Aggregate or clean stone, varying in size from three-quarter (3/4) inch (19.1 mm) to two and one half (2-1/2) inch (63.5 mm) shall be placed in the trench to the depth and grade required by this section. The perforated section shall be laid on the aggregate in an approved manner. The perforated section shall then be covered with aggregate to the minimum depth required by this section. The aggregate shall then be covered with geotextile or landscape filter fabric materials, or similar porous material to prevent closure of voids with earth backfill. No earth backfill shall be placed over the aggregate cover until after inspection and acceptance."
29. Appendix G 11 (c) is modified. Refer to Table A.
30. Appendix G 12 (a) is modified to read: "Other collection and distribution systems may be approved by the Administrative Authority as allowed by Section 301.0 [Standards and Alternatives] of this Code."
31. Appendix G 12 (b) is modified to read: "Nothing contained in this appendix shall be construed to prevent the Administrative Authority from requiring an alternative design if the Administrative Authority determines that the first submitted design will not maintain a safe and sanitary condition."
32. Table G-1 is modified. Refer to Table B – Location of Graywater System and Setback Requirements.
33. Table G-2 is modified. Refer to Table C – Effluent Application Loading Rates to Soil for Graywater Systems.
34. Figure G-1 is modified. Refer to Illustration A – Graywater System Tank – Gravity.
35. Figure G-2 is modified. Refer to Illustration B – Graywater System Tank – Pumped.
36. Figure G-3 is modified. Refer to Illustration C – Graywater System Multiple Tank Installation.
37. Figure G-4 is modified. Refer to Illustration D – Graywater System Underground Tank – Pumped.
38. Figure G-5 is modified. Refer to Illustration E – Graywater System Typical Irrigation Zone Layout.

Table A. Irrigation Disposal Fields.
Irrigation/disposal fields shall be constructed as follows:

	Minimum	Maximum
Number of perforated drain lines per irrigation zone	1	--
Length of each perforated drain line	--	100 ft. (30.5 m)
Bottom width of trench	6 in. (15.2 cm)	24 in. (61.0 cm)
Spacing of lines, center-to-center	4 ft. (1/2 m)	--
Depth of earth cover over aggregate	9 (22.9 cm)	
Depth of aggregate cover over the lines	2 in. (5.1 cm)	--
Depth of aggregate beneath lines	3 in. (7.6 cm)	--
Grade of perforated lines	Level	3 in./100 ft. (7.6 cm/30.5 m)
Total depth of trench	17 in. (43.1 cm)	24 in. (61 cm)”

Table B. Location of Graywater System and Setback Requirements.

Minimum Horizontal Distance in Clear Required From:	Holding/Surge Tank (feet)(meters)	Irrigation/Disposal Field (feet)(meters)
Building structures[1]	5[2] ft. (1.5 m)	2[3] ft. (0.6 m)
Property line adjoining private property[4]	50 ft. or 5 ft. (15.2 m or 1.5 m)	50 ft. or 5 ft. (15.2 m or 1.5 m)
Water supply wells[4, 5]	100 ft. (30.5 m)	100 ft. (30.5 m)
Streams, lakes, and reservoirs[4, 5]	100 ft. (30.5 m)	100[6] ft. (30.5 m)
Domestic water source[7]	200 ft. (61.0 m)	200 ft. (61.0 m)
Dry wash/drainage easements[10]	50 ft. (15.2 m)	50 ft. (15.2 m)
Sewage pits	5 ft. (1.5 m)	5 ft. (1.5 m)
Disposal field and 100% expansion area	5 ft. (1.5 m)	4[8] ft.
Septic tank	0 ft.	5 ft. (1.5 m)
On-site domestic water service line	5 ft. (1.5 m)	5 ft. (1.5 m)
Pressurized public water main	10 ft. (3.0 m)	10[9] ft. (3.0 m)

Notes: When irrigation/disposal fields are installed in sloping ground, the minimum horizontal distance between any part of the distribution system and the ground surface shall be 15 feet (4.6 m).

[1] Including porches and steps, whether covered or uncovered, breezeways, roofed patios, carports, covered walks, covered driveways and similar structures or appurtenances.

[2] The distance may be reduced to zero feet for above ground tanks when 1st approved by the Administrative Authority.

[3] Assumes a 45-degree angle from foundation.

[4] The setback requirement may be reduced to a minimum of 5 feet (1.5 m) with a written and recorded waiver from the adjacent property owner if a 100-foot (30.5 m) separation distance can be maintained from an existing or proposed individual well.

[5] Where special hazards are involved, the distance required shall be increased as may be directed by the Administrative Authority.

[6] These minimum clear horizontal distances shall also apply between the irrigation/disposal field and the maximum lake or reservoir level.

[7] A point of water intake or suction pipeline from any stream, lake or reservoir that is used for the purpose of providing water for human consumption.

[8] Plus 2 feet (0.6 m) for each additional foot (meter) of depth in excess of 1 foot (0.3 m) below the bottom of the drain line.

[9] For parallel construction/for crossings, approval by the Administrative Authority shall be required.

[10] Fifty-foot (15.2 m) setback is measured from the edge of the defined natural channel bank for a drainage area of at least 5 acres (2 hectare) or a drainage easement, whichever is less. Setback may be reduced to 25 feet (7.6 m) up gradient from the system, if channel erosion protection is provided (naturally or man-made) and approved by the Administrative Authority.

Table C. Effluent Application Loading Rates to Soil for Graywater Systems.
Instructions: Read questions in sequence beginning with A. The maximum soil loading rate in gallons per day per square foot (gpd/sq. ft.) (Lpd/sq. m.) corresponds to the first "yes" response to the questions.

	Soil Application Rates gpd/sq. ft. (Lpd/sq. m.)	Percolation Rate Range minutes/inch (min./cm.)
A. Is the horizon gravelly coarse sand or coarser?	0 (0)[1]	--
B. Is the structure of the horizon moderate or strongly platy?	0 (0)[1]	--
C. Is the texture of the horizon sandy clay loam, clay loam, silty clay loam, or finer and structure weak and platy?	0 (0)[1]	--
D. Is the moist consistence stronger than firm or any cemented class?	0 (0)[1]	--
E. Is texture sandy clay, clay, or silty clay of high clay content and structure massive or weak?	0 (0)[1]	--
F. Is texture sandy clay loam, clay loam, silty clay loam, or silty loam and structure massive?	0 (0)[1]	--
G. Is the texture of the horizon loam or sandy loam and the soil structure massive?	.20 (8.15)	16-45 (6.3-17.7)
H. Is texture sandy clay, clay or silty clay of low clay content and the structure moderate or strong?	.20 (8.15)	45-60 (17.7-23.6)
I. Is texture sandy clay loam, clay loam, or silty loam and structure weak?	.20 (8.15)	45-60 (17.7-23.6)
J. Is texture sandy clay loam, clay loam, or silty clay loam and structure moderate or strong?	.40 (16.30)	45-60 (17.7-23.6)
K. Is texture sandy loam, loam, silty loam and structure weak?	.40 (16.30)	16-45 (6.3-17.7)
L. Is texture sandy loam, loam, silty loam and structure moderate or strong?	.60 (24.45)	16-45 (6.3-17.7)
M. Is texture fine sand, very fine sand, loamy fine sand, or loamy very fine sand?	.40 (16.30)	10-30 (3.9-11.8)
N. Is texture loamy sand or sand?	.80 (32.59)	10-20 (3.9-7.9)
O. Is texture coarse sand?	1.20 (48.89)	2-10 (0.8-3.9)

Notes:
[1] Graywater systems for these soil types shall comply with paragraph G 12 (a) and G 12 (b) of this appendix.

Illustration A. Graywater System Tank -- Gravity

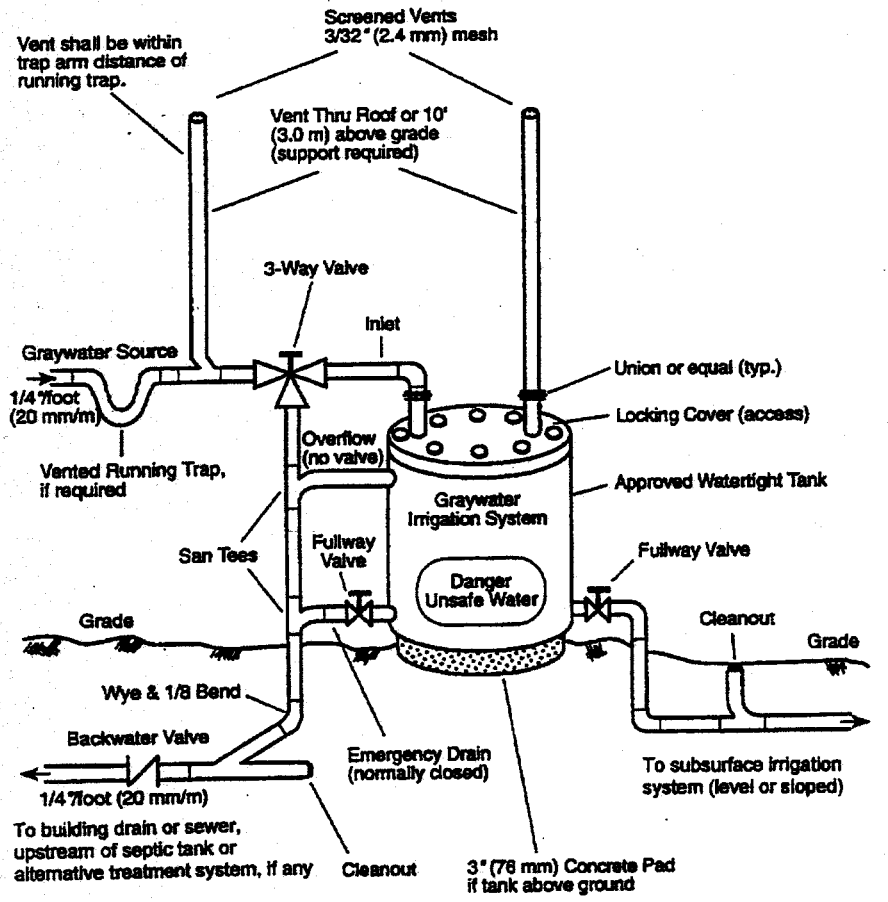


Illustration B – Graywater System Tank – Pumped.

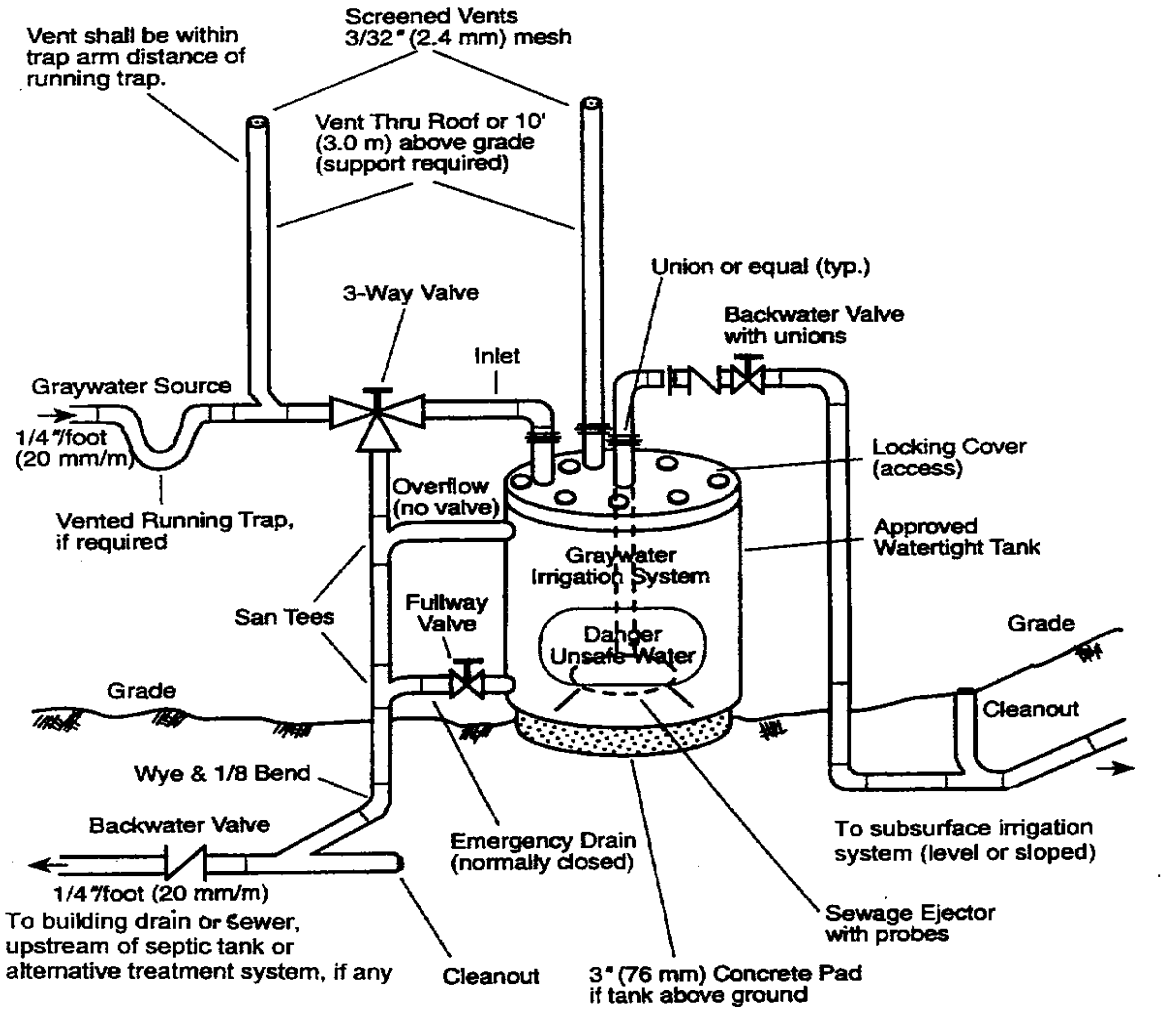


Illustration C. Graywater System Multiple Tank Installation

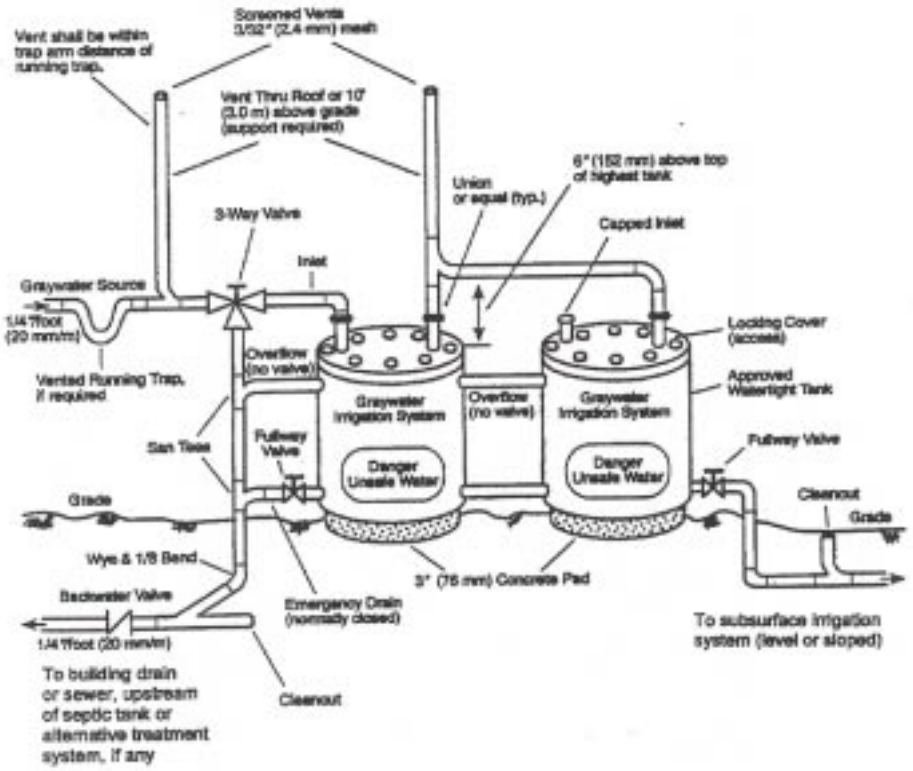


Illustration D. Graywater System Underground Tank -- Pumped

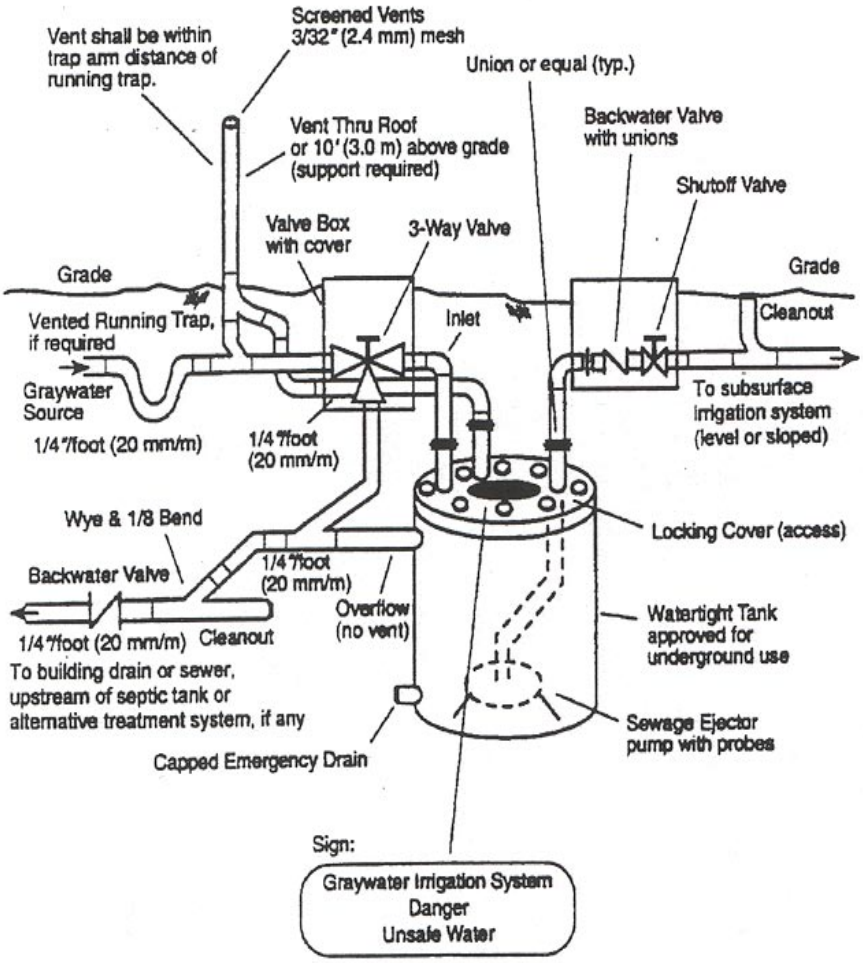
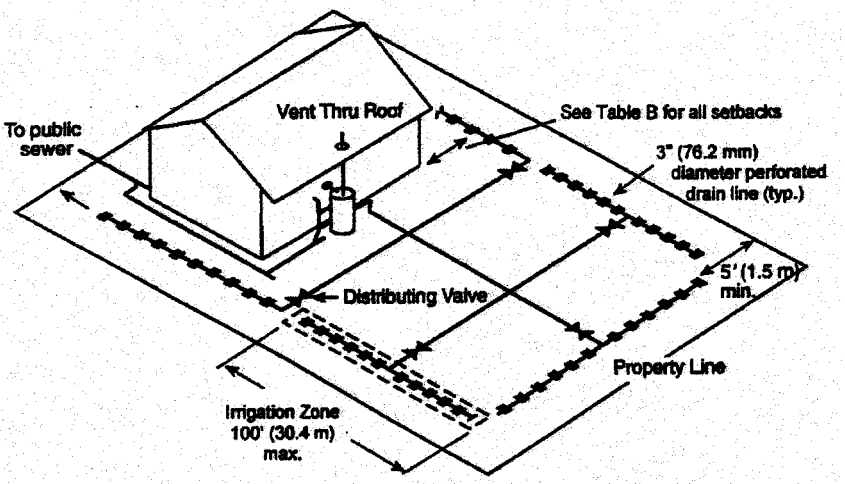


Illustration E. Graywater System Typical Irrigation Zone Layout



Note: Each irrigation zone shall have a minimum effective absorption/irrigation area in square feet predicated on the estimated graywater discharge in gallons per day and on the type of soil found in the area. The area of the field shall be equal to the aggregate length of perforated pipe sections within the irrigation zone times the width of the proposed zone.