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Proposed change in red
Explanation/rational in blue

CHAPTER 15
ALTERNATE WATER SOURCES FOR NONPOTABLE APPLICATIONS

1503.2 (Formerly 1502.2) System Requirements. Gray water shall be permitted to be diverted away from a sewer or private sewage disposal system, and discharge to a subsurface irrigation or subsoil irrigation system, ***mulch basin***, *or disposal field*. ~~The gray water shall be permitted to discharge to a mulch basin for single family and multi-family dwellings residential occupancies.~~ Gray water shall not be used to irrigate root crops or food crops intended for human consumption that comes in contact with soil.

Proposed change: Add “mulch basin” to the list of places to discharge graywater and remove the sentence about only using mulch basin for residential occupancy.

Rational: Using a mulch basin is considered a best practice by graywater installers. The basin full of wood chips is very effective at preventing ponding or runoff, and for providing surge capacity. I can’t think of any reason that this best practice should be only allowed for residential properties. There are two commercial properties in California that I know about utilizing mulch basin systems with high success. Evergreen Lodge and Rush Creek Lodge in Yosemite, California. These permitted systems have been managing graywater and irrigating landscape plants for over 50 cabins at the lodge.

1503.8.1 (Formerly 1502.8.1) ~~Single Family Dwellings and Multi-Family Dwellings.~~ *Residential Occupancies*. The gray water discharge for ~~single family and multi-family dwellings~~ *residential occupancies* shall be calculated by water use records, calculations of local daily per person interior water use, or the following procedure:

(1)

(2) The estimated gray water flows of each occupant shall be calculated as follows:

Showers, bathtubs ~~and lavatories~~	~~25~~ gallons **13** (95 L) per day/occupant
Lavatories	11 gallons per day/occupant
Laundry	~~15~~ gallons **10** (57 L) per day/occupant

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Proposed changes:

1) Update the estimated gallons per day based on the 2016 Residential End Use of Water study.
2) Separate out sinks from showers/bathtubs because many systems don't include the sink and there is currently no way to reduce the sizing to accommodate this. Also, if someone wanted to permit just a lavatory sink they should have an estimate that does not include showers/baths. Note: The number from the REUS for sinks combines lavatory and kitchen sinks, so is overly high, but since there is no reputable study showing just lavatory sinks it would be better to use this overly high estimate than do nothing.

Rational: The numbers of 25 gpcd for showers/baths/lav and 15 gpcd for washers are outdated and reflective of flow rates from the 1999 Residential End Use of Water Study (REUS). This code should be updated to reflect the new REUS study released in 2016. The study found that per capita indoor use has gone down overall.

New numbers are:

Clothes Washer- 9.6 gpcd
Shower: 11.1 gpcd
Bath 1.5 gpcd
Faucets (this includes all sinks, which is not representative of graywater sink flow rates limited to the bathroom, but the study didn't provide any other numbers for sinks) 11.1 gcd

View the study here
http://www.waterrf.org/PublicReportLibrary/4309A.pdf

1503.9.1 (Formerly 1502.9.1) Surge Tanks. Where installed, surge tanks shall be in accordance with the following:

(5) Each surge tank shall have an overflow drain. The overflow drains shall have permanent connections to the building drain or building sewer, upstream of septic tanks. The overflow drain shall not be equipped with a shutoff valve, and it shall be protected with a backwater valve installed in accordance with this code.

Proposed change: Add the backwater valve protection in this section so it can be removed in section 8 below.

(8) ~~Where a surge tank is installed underground, the system shall be designed so that the tank overflow will gravity drain to the existing sewer line or septic tank. The tank shall be protected against sewer line backflow by a backwater valve installed in accordance with this code.~~

Proposed change: Remove this section. Requiring a gravity drain on a surge tank is overly restrictive and not required for other types of tanks, like sewage ejection tanks. The cost to install a gravity drain can be very high due to extensive plumbing work that may be required to reach the sewer. (Note that the backwater valve requirement should be included and I suggest moving it to number 5 above.)

TABLE 1504.2 (Formerly 1502.10)
DESIGN OF SIX TYPICAL SOILS

TYPE OF SOIL	MINIMUM SQUARE FEET OF IRRIGATION AREA PER 100 GALLONS OF ESTIMATED GRAY WATER DISCHARGE PER DAY	MAXIMUM ABSORPTION CAPACITY IN GALLONS PER SQUARE FOOT OF IRRIGATION/LEACHING AREA FOR A 24-HOUR PERIOD
~~Coarse sand or gravel~~	~~20~~	~~5.0~~
Sand	25	4.0
~~Fine sand~~	~~25~~	~~4.0~~
Sandy loam	40	2.5
Loam	50	2
Clay loam	63	1.6
Sandy clay	60	1.7
Clay	100	1
~~Clay with considerable sand or gravel~~	~~90~~	~~1.1~~
~~Clay with small amounts of sand or gravel~~	~~120~~	~~0.8~~

Proposed change: Delete “type of soil” that are not soils types typically found in the upper levels of the soil horizon (where graywater is discharge) which are “coarse sand or gravel, clay with considerable sand or gravel, and clay with small amounts of sand or gravel.” Instead, include soil types into the chart that are found in the upper soil horizon, which are “sand, sandy loam, loam, clay loam, and clay.”

Rational: The soil types in this chart are not typically found in the upper should horizon and should be updated to reflect upper soil horizon soil types.

If you send a soil sample into a lab for a soil texture test you will never be given some of the names of soils in the current table. This table should be updated to reflect common/typical soil types.

This sample soil texture report from a lab shows soils types typically found, which you can see don't match up with the current version of Table 1504.2.

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REPORT NUMBER: CLIENT: SUBMITTED BY:

SEND TO: GROWER:

DATE OF REPORT: **SOIL PHYSICAL CHARACTERISTICS** PAGE: 1

Sample ID	Lab Number	% Sand	% Silt	% Clay	Soil Texture		Moisture @ 15 Bar	Available Water %
T2-1	52631	43	26	31	CLAY LOAM			
T2-2	52632	51	20	29	SANDY CLAY LOAM			
T2-3	52633	51	22	27	SANDY CLAY LOAM			
T2-4	52634	39	30	31	CLAY LOAM			
T6A-1	52635	19	40	41	SILTY CLAY			
T6A-2	52636	13	34	53	CLAY			
T6A-3	52637	14	33	54	CLAY			

NOTES:

code.