

BUILDING CODES DIVISION

OREGON SMART GUIDE

WATER CONSERVATION SYSTEMS



 DEPARTMENT OF
CONSUMER
& BUSINESS
SERVICES
Building Codes Division

The logo for the State of Oregon Building Codes Division is a dark blue rectangular box with a white border. On the left side, there is a stylized graphic of a building facade with a grey and white vertical element. The text "State of Oregon" is written in a smaller, white, sans-serif font at the top, and "Building Codes Division" is written in a larger, white, bold, sans-serif font below it.

State of Oregon
Building Codes Division

OUR MISSION

Working with Oregonians to ensure safe building construction while supporting a positive business climate.

FACTS ABOUT WASTEWATER REUSE IN OREGON

Water conservation systems collect wastewater from bathtubs, showers, bathroom sinks, and washing machines for reuse. This wastewater is also referred to as “gray water” because of the slight gray color caused by suspended solids and soap. In contrast, wastewater from the toilet is often referred to as “black water” because it will become very dark in color as it becomes septic. Gray water will turn into black water within 24 hours if it is stored and not properly treated. Oregon law does not currently allow wastewater from kitchen sinks and dishwashers, which may contain high amounts of salts, fats, oils, grease, food particles, and corrosive detergents, to be used in water conservation systems.

Because of the efforts in Oregon to conserve water both now and for the future, the Oregon Building Codes Division has approved the reuse of wastewater or “gray water” for flushing toilets as an alternate method to the state plumbing code. Oregon’s alternate method for water conservation systems focuses on manufactured, “off-the-shelf” and pre-designed systems. You can find information about the water conservation system statewide alternate method for flushing toilets in homes and commercial buildings at www.bcd.oregon.gov.

THINGS TO CONSIDER

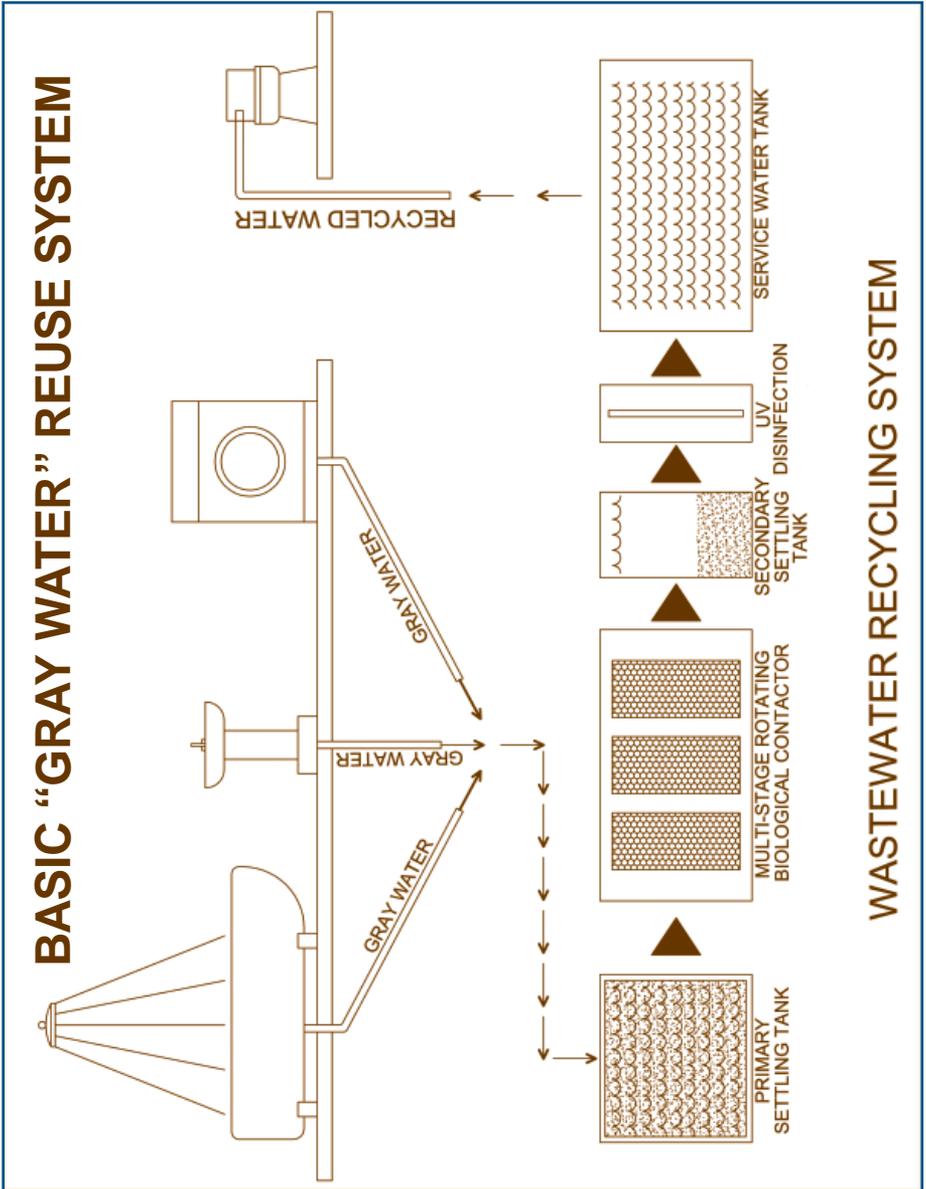
The average person in the United States uses approximately 50 gallons of potable water a day for indoor use. Installing low-volume plumbing fixtures and a water conservation system can reduce potable water consumption by almost one-third.

AVERAGE DOMESTIC WATER USE:

Shower and bath	35%
Toilet flushing	30%
Laundry	20%
Kitchen and drinking	10%
General cleaning	5%

Figure 1 shows a basic water conservation or gray water reuse system. This example shows how wastewater from the shower, bathtub, washing machine, and bathroom sink is collected and drained into a holding or storage tank, where it is filtered and disinfected. The treated water is then pumped to supply the toilets with water for flushing. This particular system uses ultraviolet light to disinfect the filtered gray water. Wastewater from the toilet and kitchen sink are connected to the building drain, which connects to the municipal sewer or individual septic system.

A clean water-supply line may be provided for cleaning and filling the service water tank in the event there is not enough wastewater available. Potable water connections must have appropriate backflow protection. If the tank receives too much wastewater, the excess is drained to the sewer drain through an overflow pipe.



BASIC "GRAY WATER" REUSE SYSTEM

WASTEWATER RECYCLING SYSTEM

Figure 1.

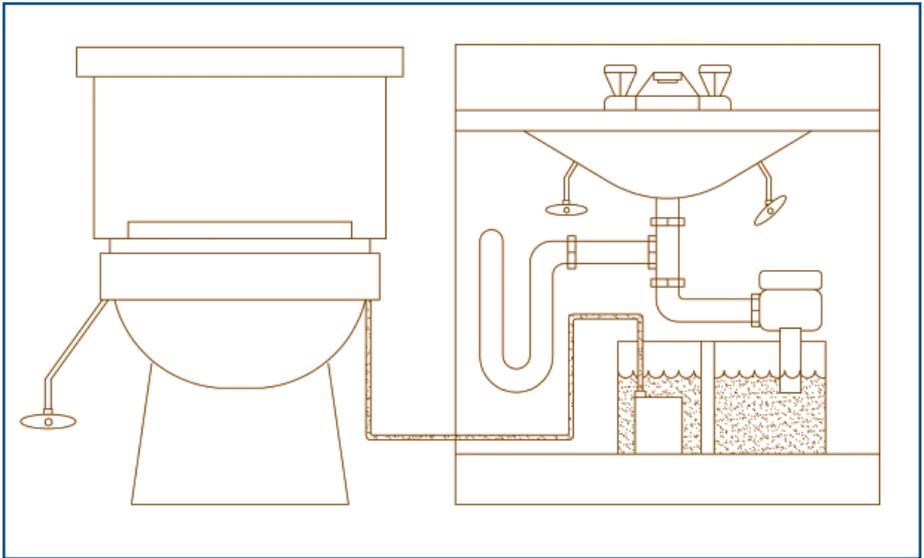


Figure 2.

SIZING YOUR SYSTEM

Water conservation or gray water systems range in size from small ones that supply water to a single toilet within a home, to large ones that supply water to all of the toilets in a commercial building. **Figure 2** shows a typical residential wastewater reuse system. It is designed to use wastewater from the bathroom sink (or lavatory) to supply flush water for a single toilet. Many of these single toilet systems are available as pre-designed units or kits that a homeowner can install after getting a permit.

Since flushing toilets uses about 30 percent of a household's wastewater stream, water conservation systems only need to recover about 30 percent of the wastewater produced. If you require more water for flushing toilets, the potable water system will be used to make up the difference — for example, if you have several visitors in your home and need more water for toilet flushing than is being produced from bathing and clothes washing. Alternatively, any additional water supply could be provided by stored rainwater, saving the potable water supply for other uses. If you generate more wastewater than you need to flush toilets, the system will automatically drain the excess to the building sewer through an overflow pipe.

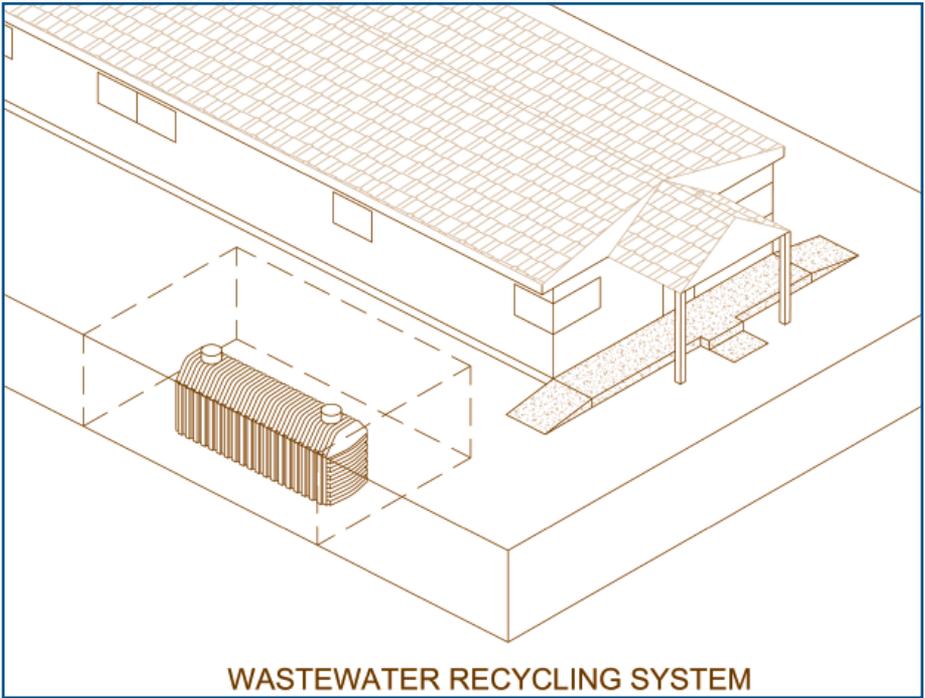


Figure 3.

Because you only need to recover about 30 percent of the home wastewater stream to flush toilets, it may be unnecessary to recover wastewater from all of your plumbing fixture drains. You may only want to use the least-contaminated wastewater available such as shower and bathing water. Laundry rinse water is the next best water for reuse. However, laundry rinse water may contain lint that can clog filters in your system. Likewise, lavatory or bathroom sink water may contain hair, toothpaste, and other debris that will need to be filtered out. Some wastewater recycling systems do not recommend using bathroom sink water as very little water is drained from bathroom sinks in comparison to other plumbing fixtures.

SHOPPING FOR YOUR SYSTEM

A variety of water conservation or gray water reuse systems have been approved for sale in the United States. Currently, both the International Association of Plumbing and Mechanical Officials (IAPMO) and Canadian Standards Association (CSA) International have set product standards for water conservation systems. An American National Standards Institute (ANSI) accredited product-listing agency must list any water conservation systems installed in Oregon. You may want to consult with a plumbing contractor on what type of system is best for your needs.

INSTALLING YOUR SYSTEM

Even though buildings can be retrofitted with a water conservation system, incorporating these systems into new construction is easier and cheaper.

In Oregon, installing wastewater recycling and treatment systems in new or existing homes requires a plumbing permit. After you get your permit, you should follow the manufacturer's instructions for installing your system. If you need more information on general piping, piping protection and support, proper alignment, fittings, and general plumbing system regulations consult the 2008 Oregon Plumbing Specialty Code, which is available online at www.bcd.oregon.gov.

MAINTAINING YOUR SYSTEM

Taking care of a wastewater recycling system is similar to maintaining a swimming pool or hot tub spa. Refer to your manufacturer's operating instructions, as each wastewater recycling system has maintenance requirements. Wastewater can contain pathogens, viruses, and parasites, as well as oils, fats, salts, and residue from cleaning, personal care, and pharmaceutical products. Exposure to these materials can pose health risks and environmental problems.

It is important to think about what goes down the drain when you have a recycling system. For instance, soap residue in wastewater can build up in the toilet tank and will need to be removed. Use soaps and cleansers that the manufacturer of the wastewater system has approved to ensure optimal functioning. In addition, lint from laundry water may require you to clean your system's filters more often. Adding a filter at the washer discharge hose may be a good solution for some systems.

Follow the disinfection and filtering process recommended by the manufacturer of the wastewater treatment system you install. Untreated wastewater should never be stored for more than 24 hours as it will become septic. If you are not able to maintain disinfection of the wastewater, discharge it into the sewer system.

Filters typically should be cleaned every two to three weeks, but the frequency of cleaning will depend on the type of filter used as well as what goes down the drain. Always wear gloves and avoid contact with wastewater when cleaning filters. Because wastewater may contain pathogens, some filters may require additional cleaning in a disinfectant.

Many systems need a regular charge of a chemical agent such as chlorine or bromine. Follow the manufacturer's operating instructions. Pumps and controls may also require service.

All systems require flushing the holding tank two or three times a year. To flush the tank, the wastewater system needs to be taken offline. If the system serves several drains in the building, the drains will have to be put out of service or a by-pass to the sewer opened. The water in the tank will need to be drained to the sewer and flushed. Always follow the manufacturer's operation instructions.

To ensure optimal function of your gray water system follow a regular maintenance schedule and be conscious of what goes down the drain.

For more information on water conservation systems, contact the chief plumbing inspector for the State of Oregon at 503-373-7488.

Don't forget your plumbing permits. Learn more by going to www.permitsprotect.info.

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Department of Consumer & Business Services

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