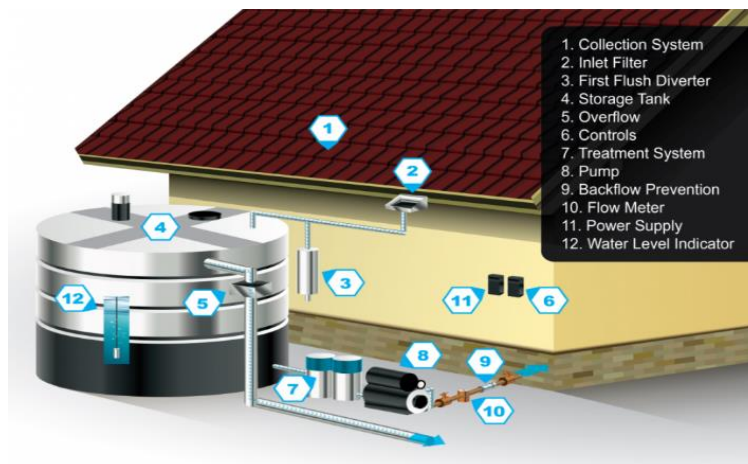


## LATEST TECHNOLOGY DESCRIPTION

Harvested rainwater can provide a source of alternative water to federal facilities. Alternative waters are sustainable sources of water, not supplied from fresh surface water or groundwater, that offset the demand for freshwater. Rainwater harvesting captures, diverts, and stores rainwater from rooftops for later use. Typical uses of rainwater include landscape irrigation, wash applications, ornamental pond and fountain filling, cooling tower make-up water, and toilet and urinal flushing. With additional filtration and disinfection, harvested rainwater can also be treated to potable standards to supplement municipal **potable water** supplies to facilities.



## SYSTEM COMPONENTS

- ❖ Collection system: Roof surface and gutters to capture the rainwater and send it to the storage system

- ❖ Inlet filter: Screen filter to catch large debris
- ❖ First flush diverter: Diverter that removes debris not captured by the inlet filter from the initial stream of rainwater
- ❖ Storage tank: Storage tanks composed of food-grade polyester resin material approved by the U.S. Food and Drug Administration (FDA), which is green in color and helps to reduce bacterial growth
- ❖ Overflow: Drainage spout that allows for overflow if the storage tank gets full
- ❖ Controls: Control system that monitors water level and filtration system
- ❖ Treatment system: Filtration and disinfection system that treats the water to non-potable or potable standards
- ❖ Pump: Pump to move water through the system to where it will be used
- ❖ Backflow prevention: Backflow preventer to ensure that under negative pressure water cannot flow backwards through the system into the make-up water system
- ❖ Flow meter: Flow meter (with data logger) to measure water production
- ❖ Power supply: Systems may use either conventional power sources or, to improve off-grid capabilities, alternative sources such as stand-alone or grid-tied solar systems
- ❖ Water level indicator: Monitors the water level in the storage tank

## Technology Considerations

---

- ✓ ❖ End Use: The intended end use of the harvested rainwater will determine the type of treatment equipment that the system will need
- ❖ Applications: Choose a location that has multiple applications that can use rainwater, such as vehicle wash, landscape irrigation, and dust suppression.
- ❖ Size of catchment area (roof size): A larger roof area can capture significant amounts of precipitation, even in areas of low rainfall availability.
- ❖ Rainwater storage capacity: Areas with less frequent precipitation may require larger tanks to provide more storage capacity between water recharge. An increased tank size will increase equipment cost.
- ❖ Roof pitch and type: Roof material and pitch influence the amount of water that can be harvested. Lower-pitched roofs tend to catch more water than steeply pitched roofs. Smoother roof textures will facilitate runoff better than textured roofs.
- ❖ Water rates: Areas with higher water rates will make rainwater harvesting projects more economically viable.

## System Sizing

---

- ☐ ❖ Determine how much rainwater is available for harvesting. FEMP's **Rainwater Harvesting Tool** can be used to estimate

amount of monthly rainfall over a typical year that can be collected from a rooftop or other hard surfaces.

- ❖ Estimate the application's water demand over the same period. If possible, determine the monthly demand for the application over a full year.
- ❖ Compare the amount of monthly rainfall that can be harvested to the monthly water demand over the year. Is there generally enough rainfall to supply a significant portion of the application's demand?
- ❖ Determine an optimal storage tank size that provides enough volume to store adequate rainfall to meet the demand while not oversizing the tank

Note: If there are large variations in rainfall throughout the year, a larger tank may be necessary to store rainwater during wet months for use during drier months. Additional treatment may be necessary to maintain water quality. In addition, it may be advantageous to compare weekly precipitation to weekly demand to get a more precise picture of the availability of rainfall to meet the water requirements of the application.