

CHAPTER 9
WATER RE-USE SYSTEMS
NON-POTABLE WATER DERIVED FROM
VARIOUS SOURCES

SECTION 901
GENERAL

901.1 Scope. Subject to outside approvals pursuant to 901.2 of this Code, this Chapter shall provide provisions to facilitate certain non-potable water uses in non-residential applications only. Such uses may include, but are not limited to, toilet and urinal flushing, mechanical systems and equipment cooling. Certain applications of non-potable water (e.g., irrigation [sub-surface, drip or spray], general hose bibb applications or automatic and/or self service vehicle washing operations) may require additional provisions to ensure safety. This Code does not provide plumbing fixture guidelines for such applications; approvals and provisions shall be provided by the authority having jurisdiction.

901.1.1 Exceptions. This chapter is not applicable to process water recycling which is unique to, and self contained within, a specific water utilizing process such as, but not limited to, vehicle washing, laundering, ice melt, or similar uses. These regulations also do not apply to residential use of rain barrels for outside irrigation, where the system does not come in contact with the building's plumbing system.

901.2 Additional Outside Jurisdiction Requirements. All *centralized non-potable water* use projects and *decentralized non-potable water* use projects must *first* be authorized by the the appropriate county agencies (authority having jurisdiction). The appropriate authority having jurisdiction is responsible for oversight of the design, operation, maintenance, monitoring, recordkeeping and reporting requirements of the non-potable water projects. This includes establishing safe-minimum water quality standards for *each intended non-potable water application* and monitoring for compliance with the standards. At all times, in addition to the local county standards, all applicable federal and state water quality standards shall be met.

901.3 Definitions. In addition to the definitions included in Chapter 2 of this code, the following definitions are specifically applicable to the provisions of this Chapter 9, Water Re-Use Systems.

901.3.1 Non-Potable Water. Water which is *not reliably* safe for drinking, personal use or culinary related utilization.

901.3.2 Centralized Non-Potable Water Systems. Non-potable water that is treated and distributed from a central location, e.g., a wastewater treatment plant

901.3.3 Decentralized Non-Potable Water Systems. Non-potable water that is collected, treated and used on location.

901.3.4 Water Re-Use Systems. Varieties of water recycling from the following sources: wastewater treatment plant effluent; graywater; rainwater; ground water; condensate; process and equipment discharge.

901.3.4.1 Reclaimed Water. Enhanced wastewater effluent produced at a *centralized* municipal wastewater treatment plant, resulting in recycled water suitable for various, yet specific non-potable uses.

901.3.4.2 Graywater System. A *decentralized* water re-use system that employs on-site treatment of the discharge from specific plumbing fixtures such as bathtubs, showers, lavatory sinks, clothes washers, laundry tubs/trays, etc. thereby producing recycled water for various specific non-potable uses.

901.3.4.3 Rainwater Harvesting System. A *decentralized* water re-use system that employs on-site treatment of captured rainwater from rooftop and similar elevated decking areas thereby producing recycled water for various specific non-potable uses.

901.3.4.4 Groundwater Re-Use System. A *decentralized* water re-use system that employs on-site treatment of captured groundwater from foundation drainage systems thereby producing recycled water for various specific non-potable uses.

901.3.4.5 Condensate Re-Use System. A *decentralized* water re-use system that employs on-site treatment of captured condensate from refrigeration and air conditioning systems thereby producing recycled water for various specific non-potable uses.

901.3.4.6 Process Water Re-Use System. A *decentralized* water re-use system that employs on-site treatment of captured process wastewater from various systems thereby producing recycled water for various specific non-potable uses.

901.3.5 Blackwater. A sanitary sewer flow containing human waste such a fecal matter or urine, or kitchen waste water.

901.3.6 Non-Residential Building or Occupancy. The classification non-residential shall apply to any building type or occupancy that does not meet the parameters of a Group R-3 occupancy as set forth in the International Building Code. Group R-3 classifications include single family homes and row style townhomes (single dwelling unit from bottom floor to top floor). All other building types or occupancies shall be deemed non-residential.

901.4 Limitations. WSSC and this code do not regulate the production and safety of non-potable water or ensure that non-potable water quality standards are being met.

SECTION 902 PERMIT

902.1 Permit. The installation of *Water Re-Use Systems* shall require a Long Form Permit where any such system utilizes any one of the following conditions:

902.1.1 Potable Water Connection. Any connection regardless of intended use: manual or automatic feed; emergency back-up or routine supplementation.

902.1.2 Sanitary Drainage Connection. Any connection, whether direct or indirect.

902.1.3 Use Within the Building. Any utilization of non-potable water within the building, including but not limited to, toilet and urinal flushing; mechanical system make-up; equipment cooling; etc.

902.1.4 Shared Space. Where any Water Re-Use System or associated collection and/or distribution piping shares space with any other plumbing or mechanical system components.

902.2 Plans Review Required. Design plans, as required per 904.1 below, shall be submitted along with the required permit application for WSSC review.

SECTION 903 BACKFLOW PREVENTION AND METERING

903.1 Required Backflow Assembly. The interconnection between a potable water distribution system and a water re-use system shall be protected against backflow with an ASSE 1013 RPZA backflow assembly or equivalent. The interconnection shall be limited to whole system supply connection(s) and not permitted on a per fixture or a per equipment basis.

903.2 Required WSSC Meter. In general, water re-use systems shall be metered to account for discharges to the sanitary sewer as follows:

903.2.1 Standard Details. Sewer use meters shall be installed following WSSC Standard Details.

903.2.2 Location. Where possible, the meter shall be located downstream of the water treatment process. The meter shall be located within a pressurized section of the water re-use treatment system and downstream of a 100 micron filter.

903.2.3 Treatment Waste and Backwash. Liquid waste or backwash generated from the non-potable water treatment process shall be:

903.2.3.1 Directed back to the head of the treatment process, where possible; or

903.2.3.2 Metered and discharged to the sanitary sewer.

903.2.3.3 All discharges to the Sanitary Sewer System must comply with the WSSC Regulations outlined in Chapter 8, Industrial and Special Waste.

903.2.3.4 Where these conditions cannot be met, the waste shall be hauled away and properly disposed of.

903.2.4 Exception for Graywater Systems. Where graywater or similar systems receive the waste stream from plumbing fixtures or equipment that is served with WSSC metered water, additional sewer use metering is not required.

SECTION 904 SYSTEM DESIGN

904.1 General. Water Re-Use Treatment Systems and associated collection and distribution piping shall be designed by a registered professional engineer.

904.1.1 Construction Documents. Design plans shall include plan views, including exterior tanks and associated piping, complete elevation schematics, and corresponding equipment schedules. Zoom and scale shall be adequately enlarged to facilitate a clear understanding of all equipment, appurtenances and flow direction.

904.2 Sources. The sources of water for water re-use systems shall include, but are not limited to, as follows:

904.2.1 Graywater. Bathtubs, showers, lavatory sinks, clothes washers and laundry trays.

904.2.2 Rainwater. Rooftop drainage systems; elevated patios, decks, and similar.

904.2.3 Groundwater. Subsurface foundation drain systems and similar.

904.2.4 Condensate. Refrigeration and air conditioning condensate.

904.2.5 Clear Process Waste. Equipment cooling, steam recovery, ice melt, fire pump test, and similar “clear” process waste.

904.3 Prohibited Sources.

904.3.1 Blackwater. Urine, fecal waste, kitchen waste, and similar.

904.3.2 Blood Borne Waste. Hospitals, Laboratories, Morgues.

904.3.3 Industrial Waste. Untreated industrial waste.

904.3.4 Surface Water. At grade surface run-off or at grade ponded/standing water

904.3.5 Vehicle Generated Waste. Parking lots, decks, or garages; vehicle service centers; vehicle washing operations; and similar.

904.4 Reclaimed Water. Treated wastewater treatment plant effluent differs from other water re-use systems in that the treatment process is performed at the municipal level, offsite from the use. It is then piped to the property in a municipal utility approved manner, but then is distributed and utilized on property as required of other water re-use systems described in this code. Uses for reclaimed water are limited to the uses set forth by the Maryland Department of the Environment. This use is synonymous with *centralized non-potable water* systems.

904.5 Minimum Water Quality Standard. It is the responsibility of the appropriate State and County Government Agencies to establish water quality standards. At a minimum, non potable water produced for plumbing, mechanical and industrial process as allowed by this Code, shall meet the parameters set forth by the Maryland Department of the Environment – Class IV effluent water quality standard, or other equivalent standards established by local authorities.

904.6 Collection Piping. All collection piping within a building shall be designed and installed in accordance with IPC Chapters 3, 7, 9 & 10 and this Code. Marking and labeling shall be required of all collection piping, above and below grade, whether under gravity flow or pump pressure conditions.

904.6.1 Graywater Collection Piping. Graywater collection piping systems and associated collection reservoirs/sumps shall be protected from the sanitary sewer system by segregation, an air gap or a backwater valve.

904.7 Distribution Piping.

904.7.1 Design and Installation. All distribution piping shall be designed and installed in accordance with IPC Chapter 3 & 6 and this code.

904.7.2 Marking and Labeling. All piping *and* pipe covering shall be marked and labeled pursuant to IPC Section 608.8. Fixture and equipment supply shut-off valves shall be tagged to alert service technicians of the origin and nature of the non-potable water.

904.7.3 Potable Water Back-up. Potable water shall be interconnected in adequate supply and volume to support the fixture demand in the event of system failure or removal. See 903.1.

904.7.4 Water Coloring. Non-potable water does not require coloring. Where coloring is specified by the designer, caution shall be used to ensure permanent staining of fixtures will not occur.

904.8 Storage Tanks.

904.8.1 Construction. When installed above or below grade, storage tanks shall be constructed to withstand internal and external forces whether the tank is empty or full.

904.8.2 Drain and Overflow. The drain and overflow of a storage tank to the sanitary sewer is only allowed for graywater systems and similar (e.g.; reclaimed water and process water), where upstream processes utilized WSSC metered water. All other “un-metered” discharges (e.g., rain water, condensate, and groundwater) shall be routed to the storm water system in accordance with relevant standards.

904.8.3 Air Gap or Backwater Valve. Where possible, an air gap shall be provided between the drain/overflow of a storage tank and its sanitary drain receptor. In lieu of an air gap, a backwater valve may be installed downstream of a storage tank directly discharging to the sanitary sewer to protect the tank from any possible back-up within the building drainage system. When directly connected, both drain and overflow shall discharge into a vented trap. Whether direct or indirect, traps serving such storage tanks shall include automatic trap priming devices.

904.8.4 Storm Sewer Connection. When applicable, water re-use collection piping, tanks, drains and overflows shall be protected from storm sewer backflow by air gap or a backwater valve(s).

904.9 Roof Washer System. Rainwater harvesting systems shall be outfitted with debris excluders or similar devices. It is recommended that roof washing systems be designed to automatically divert a sufficient volume of initial rainfall to effectively clean the roof or collection surface of undesired debris and contaminants.

904.10 Combination Systems. Multiple sources may be utilized to provide make-up to a single non-potable water treatment systems as follows:

904.10.1 Collection System Segregation. Each type of source water shall be independently routed to the treatment and storage components, unless otherwise approved by the code official.

904.10.2 Metering. Prior to joining source waters together for treatment, metering of all “non-metered” source waters shall be accomplished. Source waters shall be filtered through a minimum of a 100 micron filter.

904.10.3 Overflow and Backwash. Collection overflows and filtration backwash water shall be routed to their required corresponding collection systems (e.g.: rainwater to storm sewer; graywater to sanitary sewer. etc.)

SECTION 905 DISCLOSURE AND SIGNAGE

905.1 Distribution Piping. Distribution piping and supply shut-off valves shall be marked, labeled and tagged in accordance with Section 904.7.2.

905.2 Commercial, Industrial and Institutional Restrooms. Each restroom in these various occupancies shall have, at a minimum, one disclosure sign posted in a conspicuous location. The lettering shall be highly visible and a minimum of a ½” in height on a contrasting background with the following text: *Caution: Non-Potable Water Used for Toilet and Urinal [where applicable] Flushing*”

905.3 Water Re-use Equipment Room. In all water re-use equipment rooms there shall be a disclosure sign, or signs as needed. Each sign provided shall have highly visible lettering a minimum of a ½” in height on a contrasting background with the following text: *“This building utilizes a water re-use system that produces non-potable water for [describe use]. Prior to commencing any plumbing or mechanical work on premises, by law you must consult with the system operator.”*

SECTION 906 OPERATIONS AND MAINTENANCE

906.1 Approved Operators. Water Re-use Systems shall be operated and maintained by qualified technicians. Licensing and qualification credentials for technicians, if any, will be established by the county government agency having jurisdiction.

906.2 Operation, Maintenance, Recordation & Reporting. Operation, maintenance, recordation & reporting shall be performed consistent with the approvals to operate the system granted by the jurisdiction having authority as described in Section 901. Failure to properly operate, maintain, record and/or report the system shall constitute a violation of this Code and the water re-use system may be subject to a shut-down order requiring a disconnection of the system and supplying all related plumbing fixtures with potable water.

906.3 Minimum Water Quality. When minimum required water quality standards cannot be met, the water re-use systems shall be completely by-passed and supplied with potable water through an adequately sized interconnection. Distribution piping shall be purged and disinfected as needed.

906.4 System Shut-down and Removal. Long term shut down or removal of a water re-use system shall be done under a Short Form Permit. Collection piping shall be re-routed directly to the sanitary or storm water systems as applicable. Interconnection between the treatment system and the potable water mains *shall be* permanently divorced. Existing distribution piping shall be purged and disinfected as needed. Re-activation requires the same approvals as a new system.

906.5 Conveyance of Non-Potable Water System During Changes in Ownership and/or Building Occupancy. The new owner or tenant shall be notified of all the details related to the non-potable water system including: operations, maintenance, monitoring, recordkeeping and reporting documents. All responsibilities shall be officially transferred to, and carried-out by, the new owner/tenant and the jurisdiction having authority shall be notified of the changes in ownership.

906.6 Detailed Guidelines. The Environmental Protection Agency's 2012 Water Reuse Guidelines and the 2011 National Sanitation Foundation – NSF/ANSI 350 may be utilized for additional detailed guidelines for design, operation, maintenance and monitoring requirements of the non-potable water systems.