

Recommendations to IAMPO on Pipe Color Code to Convey On-site Alternative Waters

Background

Household and commercial wastewater can be characterized as two very two distinct wastewater streams. Wastewater generated in a toilet that is contaminated by urine or feces is called blackwater. While the definition of graywater (sometimes called “gray water,” “greywater,” or “grey water”) may vary from jurisdiction to jurisdiction, it is generally defined as all wastewater generated except toilet wastes. This could include water from bathtubs, showers, kitchen and bathroom sinks, slop sinks, dishwashers, etc. In those locations where graywater is used, it often excludes kitchen sinks and dishwashers because of the high organic content from the food wastes. This can cause the graywater to become septic very quickly because of the oxygen demand and increased microbial activity of the graywater. The use of graywater generally started in households, but more recently has sparked interest in commercial establishments.

Graywater is used primarily for household and commercial landscape irrigation purposes. Household graywater use for landscape irrigation is increasing in the U.S. Several articles published in the late 1990s and 2000 indicated that seven to nine percent of households in the U.S. were using graywater and that the use was considerably higher in some states. While some large cities such as Los Angeles have rules or ordinances that allow the installation of graywater systems that conform to state and local regulations, the extent of the practice in large cities is not well-documented in the literature. There is virtually no literature on the use of graywater in commercial establishments.

Graywater may contain: microorganisms (some likely pathogenic); dissolved salts (e.g., sodium, nitrogen, phosphates, and chloride); organics (e.g., oils, fats, milk, food, soap and detergents); or particles of dirt, lint, sand, etc. Graywater may also contain petroleum-based oils, paints, and solvents from activities that could have detrimental effects on areas irrigated with the graywater. Graywater is often contaminated with human and animal excretions from bathing and from clothes washing. Because it is not practical to analyze wastewater for all of the pathogenic organisms that may be present, sampling for organisms that are indicative of the presence of fecal contamination and of pathogenic organisms originating from human fecal matter is universally used. Based on the high concentrations of indicator organisms found in graywater, all forms of graywater are deemed to be capable of transmitting disease.

Several states have regulations directed at graywater use that generally are quite similar in their requirements. Use of untreated water from kitchens and dishwashers is often prohibited. Virtually all agencies that regulate graywater use characterize untreated graywater as a substance that has a high probability of containing pathogenic microorganisms and caution that direct and indirect contact with the water presents a health risk. Most authorities emphasize that graywater from washing of heavily soiled laundry and diapers be avoided and that graywater should not be used when there is an infectious illness in the household.

Purple Pipe

Purple is the standard color for pipe adopted internationally by the utility industry to distribute municipally treated reclaimed water. In late June 2008, municipal reclaimed water advocates became aware of a plumbing code change proposal that would require the use of purple pipe for all graywater systems. The proposal was included in updates to the 2009 Uniform Plumbing Code

(UPC) that was under development by the International Association of Plumbing and Mechanical Officials (IAPMO.) The American Water Works Association (AWWA), Water Environment Federation (WEF) and Water Reuse Association (WRA) all indicated an absolute preference that purple pipe not be utilized to convey graywater or any alternate on-site water source other than municipally treated and distributed reclaimed water.

Industry concern was swift and specific:

- Concern for potential cross connections between two purple pipe systems with significantly different water quality (graywater versus reclaimed water.)
- Concern that the public would be exposed to inadequately treated water in a municipal purple pipe system contaminated by an on-site cross connection.
- Concern that the public exposure and cross connection potential would negatively impact public confidence in the municipal reclaimed water providers which have spent decades "branding" purple pipe to contain only reclaimed water.

Over the course of many months of discussion, IAPMO concluded that no color be selected for graywater, and that the choice of the pipe color be left to the local authorities who have jurisdiction.

Recommendation

It is not useful for communities throughout the U. S. or elsewhere to be forced to individually select a pipe color to convey reclaimed water, graywater, harvested rainwater, or any other internally generated non-potable water. The UPC should be direct and specific about the pipe color and marking. Purple pipe should not convey anything other than municipally treated reclaimed water.

Through its Utility Location and Coordination Council (ULCC), the American Public Works Association (APWA) adopted a color code for marking utilities in 1980, with the most current update in October 2003. Colors are referenced to ANSI Z535.1 and require "Blue - Water, irrigation and slurry lines; Green – Sewer and drain lines; Purple – reclaimed water." The Common Ground Alliance, Best Practices Version 6.0, February 2009 also adopts the APWA Uniform Color Code. The National Utility Locating Contractors Association and National Transportation Safety Board have also adopted the APWA Uniform Color Code. AWWA Manual M-24 "Planning for the Distribution of Reclaimed Water (2009)" identifies purple as the consensus pipe color.

AWWA, WEF and WRA respectfully request that IAPMO consider the following compromise:

It is proposed that "green" be selected as the on-site pipe color for all alternate waters on private property and in buildings. Green is currently identified with wastewater and most of the on-site waters are untreated and definitely non-potable. Green is already manufactured as a standard pipe color both in pressure and gravity pipe. Black text on green pipe should be used to identify the water conveyed in the pipe. Black lettering would not cost more than applying the text to purple pipe. Our proposal to use green pipe would have the benefits of: utilizing a currently manufactured product; be compatible with UPC 601.2.2 and current draft of Chapter 5, Green Plumbing and Mechanical Supplement; and provide a cost effective solution to the matter that utilities would find acceptable. Green pipe could be introduced in the current draft Chapter 5 and then re-staffed as a Tentative Interim Amendment to amend the 2009 UPC. Thank you for considering this proposal.

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