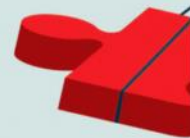


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Seeking the

**Direct potable reuse and the intersection of
the Clean Water Act and Safe Drinking Act**



With increasing interest in providing more resilient water supplies, utilities are looking to include potable reuse as an element to diversify their water supply portfolios. With no federal rules or regulations, states must develop rules or regulations to govern potable reuse within the existing federal regulatory framework. Further, the U.S. Environmental Protection Agency (EPA) is unlikely to develop new national regulations for potable reuse. However, the U.S. Clean Water Act (CWA) and Safe Drinking Water Act (SDWA), together govern protection of environmental and human health. While these two acts were not developed with planned potable reuse in mind, they have been relied upon as the existing regulatory framework governing *de facto* potable reuse for decades.

It is important to understand how the existing federal rules that govern water intersect, and whether there are legal or policy gaps that need to be filled in the context of potable reuse. It is worthwhile to consider whether a federal policy framework could serve to support the regulatory implementation of potable reuse at the state level.



final piece

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History of potable reuse

In 1980, EPA sponsored a workshop on Protocol Development: Criteria and Standards for Potable Reuse and Feasible Alternatives. In the executive summary of the resulting document – *Report of Workshop Proceedings, Protocol Development: Criteria and Standards for Potable Reuse and Feasible Alternatives* (EPA 570/9-82-005) – the chair of the planning committee noted that “A repeated thesis for the last 10 to 20 years has been that advanced wastewater treatment provides a water of such high quality that it should not be discharged but put to further use.” He continued, “This thesis when joined to increasing problems of water shortage, provides a realistic atmosphere for considering the reuse of wastewater. However, at this time, there is no way to determine the acceptability of renovated wastewater for potable purposes.”

This statement demonstrates that nearly 40 years ago there was recognition of the importance of reuse for potable purposes, as well as acknowledgment that what was known about the quality of the treated wastewater was a limitation to this practice.

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Since that time, a great deal has changed with respect to our understanding of this concept. The 2012 National Research Council (NRC) report, *Water Reuse: Potential for Expanding the Nation's Water Supply through Reuse of Municipal Wastewater*, presents a brief summary of the nation's recent history in water use and shows that although reuse is not a panacea, the amount of wastewater discharged to the environment is of such quantity that it could play a significant role in the overall water resource picture and complement other strategies, such as water conservation. One of the most important themes throughout the report is water reuse for potable reuse applications, including a discussion of both planned potable reuse and unplanned, or *de facto*, reuse.

In the 2012 EPA *Guidelines for Water Reuse*, planned potable reuse, including direct potable reuse (DPR), was acknowledged as being important for consideration and evaluation in water management planning, "consistent with the established engineering practice of selecting the highest quality source water available for drinking water production."

Current regulatory framework

Water reclamation for nonpotable applications is well established, with system designs and treatment technologies that generally are well accepted by communities, practitioners, and regulatory authorities. While use of reclaimed water to augment potable water supplies has significant potential for helping to meet future needs, planned potable water reuse only accounts for a small fraction of the volume of water currently being reused.

However, if *de facto* (or unplanned) water reuse is considered, potable reuse certainly is significant to the nation's current water supply portfolio. The unplanned reuse of wastewater effluent as a water supply is common, with some drinking water treatment facilities using source waters that are comprised of a large fraction of water originating as wastewater effluent from upstream communities. This is especially true under low-flow conditions.

Thus, the term *de facto* reuse will be used to describe unplanned indirect potable reuse (IPR). This *de facto* reuse increasingly is being recognized by professionals and the general public. Examples abound, including such large cities as Philadelphia, Nashville, Cincinnati, and New Orleans, which draw their drinking water from the Delaware, Cumberland, Ohio, and Mississippi rivers, respectively.

These communities, and most others using unplanned IPR sources, provide their customers with potable water that meets drinking water regulations by virtue of the drinking water treatment technologies used.

Examining a regulatory framework for planned potable reuse

As interest continues to increase in planned potable reuse, the lack of specific federal regulations governing this practice in the U.S. will continue to be a challenge without some guiding principles.

Examining potable reuse internationally, the regulatory approach varies from country to country. Australia, for example, published *Australian Guidelines for Water Recycling (AGWR): Augmentation of Drinking Water Supplies* in 2008. These

guidelines – a joint product of the Environment Protection and Heritage Council, the National Health and Medical Research Council, and the Natural Resource Management Ministerial Council – were developed through a two-phase effort, starting in 2006. Singapore, home of NEWater, abides by the World Health Organization drinking water guidelines instead of developing their own set of standards.

By definition, regulations refer to actual rules that have been enacted and are enforceable by governmental agencies. Guidelines, on the other hand, generally are not enforceable, but can be used in the development of a reuse program. In some states, however, guidelines are, by reference, included in regulations, and, thus, are indeed, enforceable.

In addition to providing treatment and water quality requirements, comprehensive rules or guidelines also support reuse by defining the parameters where projects must demonstrate compliance. They provide certainty that if a project meets certain requirements, it will be permitted. While state regulatory programs for water reuse may be more stringent, they must be consistent with other federal and state laws, regulations, rules, and policies.

From a technical standpoint, planned potable reuse can be a logical part of the overall water supply and water resources management solution. However, often there are projects that are feasible technically, but are not implemented. In these cases, the barriers to implementing reuse often are institutional, more specifically due to a lack of regulatory structure.

Issues that must be addressed in a regulatory framework

The challenge is that while CWA and SDWA provide a framework for potable reuse, the details or policy of implementation of potable reuse projects can be murky. It is important to understand how these comprehensive rules intersect. In particular, it is important to answer the question regarding the difference between planned potable reuse and the current *de facto* practices that have been deemed protective of public health.

The answer to this question is that potable reuse is purposeful in using treated wastewater effluent as a source or partial source to blend with other environmental water; as a result, there is potentially a higher concentration of wastewater-derived microbials and unregulated chemicals.

Thus, understanding the function of an environmental buffer is important such that it can be replaced with an advanced water reclamation facility to achieve treatment necessary to achieve water quality that is as protective of public health as our current practices.

Overarching principles of a potable reuse policy framework

A potable reuse policy framework could be patterned after other policy frameworks developed by EPA. EPA recently developed the Integrated Municipal Stormwater and Wastewater Planning Approach Framework. The stormwater framework is a simple, seven-page guidance document that lays out principles and elements of an integrated plan as well as plan implementation procedures.

A proposed potable reuse policy framework could be similar in simplicity and flexibility and address overarching principles that municipalities and primacy states would address in potable reuse plans. These plans could support agencies in meeting treated reclaimed water requirements for providing source water to be used as a drinking water supply to do the following:

- Maintain existing regulatory standards and criteria that protect public health.
- Allow a municipality to balance CWA and SDWA water quality requirements in a manner that addresses the most pressing water supply and public health issues first.
- Assign responsibility to develop a potable reuse plan with the municipality that chooses to pursue this approach; where a municipality has developed an initial plan, the state or other primacy authority will determine appropriate actions, which may include developing requirements and schedules in enforceable documents.
- Apply innovative technologies that are important tools generating many benefits; these technologies may be fundamental aspects of municipalities' plans for potable reuse solutions, with the appropriate demonstration of those technologies.
- Develop a potable reuse plan that must provide appropriate opportunities for meaningful stakeholder input.

Clarifications needed under a proposed policy framework

While currently there are no federal regulations specifically governing potable reuse in the U.S., there also are no federal legal prohibitions against this practice, although a number of states do exempt DPR from implementation. Interestingly, North Carolina recently lifted their ban on DPR in a bill that was signed into law in August 2014. Further, DPR projects already have been implemented, and others have been approved via the existing regulatory framework as defined by the CWA and SDWA.

The CWA and SDWA are federal laws that provide specific water quality criteria and standards. Any rules or regulations specifically for water reuse in the U.S. are developed at the state level. However, these state rules and regulations must abide by the federal law.

Thus, it is important to understand how the CWA and the SDWA intersect for developing requirements for potable reuse. With respect to DPR, several clarifications are needed to ensure this compliance.

- For surface water return flows of reclaimed water, permitting is conducted through the National Pollutant Discharge Elimination System, a permit program authorized to state governments by EPA and a provision of the CWA; and, return flows to groundwater are permitted through the Underground Injection Control Program, which is a provision of the SDWA. Clarification is needed on the definition of an engineered buffer. If a natural pond or existing reservoir is adapted for IPR use, local regulatory authorities need clarity regarding whether the discharge to this waterbody falls under the CWA. In another example, if reclaimed water is sent to an engineered buffer only for storage as a drinking water source, should the municipal water resource recovery facility be required to hold a National Pollutant Discharge Elimination System (NPDES) permit? Or would this situation require some other kind of operating permit?

- It is not apparent where a treated wastewater discharge is no longer defined as *effluent* and where it becomes classified as a *drinking water source*. Thus, the objective of clarifying where or how reclaimed water is classified as a source water could address some of the regulatory challenges of potable reuse.

- Excluded from the definition of "Waters of the United States" are components of engineered waste treatment systems, such as treatment ponds and constructed wetlands. Water sector planners need more clarity regarding whether engineered buffers, such as a water storage reservoir, in planned IPR scenarios are also exempt from the CWA provisions.

- EPA and states will need to determine the appropriate roles of permitting and enforcement authorities in addressing the regulatory requirements. For example, who, or what process, will determine whether the potable reuse plan should be incorporated into the NPDES permit of the entity producing the source water or the entity treating that water for drinking purposes, or both?

- Where IPR is used for recharge of groundwater used for drinking water supply, clarification is needed regarding whether periodic sanitary surveys should include analysis of the water reclamation facility.

- Regulatory authorities need guidance regarding how these systems should be regulated with respect to monitoring requirements.

While these areas of clarification are immediately notable, likely there are other questions that will emerge during the process of development of a proposed framework policy. And, a proposed path forward should include flexibility to document and explore opportunities for additional clarification.

There are important clarifications needed to protect human health and allow implementation of potable reuse. Regardless of the lack of a policy in guiding principles, planned potable reuse projects continue to be studied, planned, and implemented.

To provide guidance to utilities implementing potable reuse, a framework that leverages answers to these questions, and others, could be identified through a stakeholder process. This would engage EPA, utilities, state regulators, water organizations, professionals, and other stakeholders. It would support and enable the development of a guiding framework on a national level to provide clarity and consistency on federal regulations and national policy. Such a policy could also provide adequate flexibility such that the details of potable reuse implementation are addressed at a state or local level to meet regional and geographic requirements.

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