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Recycled Water: Opportunities & Limitations



Recycled Water — What is it?

People generally associate “recycling” with recovering materials such as soda cans, newspapers, etc., in order to reuse the material and minimize waste. Recycled water involves a similar concept wherein treated water from a municipal wastewater treatment plant is further treated to a high level quality that is suitable for beneficial uses like irrigation, commercial or industrial use or, in some cases, indirect potable reuse (see *Glossary* on back).

Essentially, all water on Earth is recycled water because it has passed through natural water cycle processes such as precipitation and evaporation. Water reuse also occurs as one city draws their drinking water supply from the same river into which an upstream city has discharged its treated wastewater. More intentional recycled water projects are being developed with specific goals to beneficially reuse treated water from municipal wastewater treatment plants.

Recycled water is generally used as an alternative to using potable (drinking) water for irrigation purposes or for groundwater recharge programs in which



Purple pipe is used to convey recycled water for irrigation and other non-potable uses.

recycled water is pumped into the ground and stored so that it can be pumped up from the aquifer at a later date to be used as drinking water (indirect potable reuse). Recycled water is subject to specific regulations, which set guidelines for use and application to ensure public health.

While many water agencies are considering recycled water programs, there are circumstances and other factors that may limit their use and effectiveness. Below is a table illustrating a few of the benefits and limitations of recycled water projects in this area.

Benefits of Recycled Water	Local Limitations
<p>Can reduce potable water needs by providing a water supply for irrigation and other non-potable uses.</p>	<ul style="list-style-type: none"> • Requires separate piping system for recycled water (i.e. purple pipe). • During drought, water for irrigation is already restricted; would still face shortage of potable water. • Could cost more than desalination. • Estimated yield is less than 10 percent of Soquel Creek Water District’s water supply requirements.
<p>Can replenish groundwater through recharge (or indirect potable reuse) in which water can then be considered potable.</p>	<ul style="list-style-type: none"> • Injection wells need to be a state-defined safe distance from all potable wells. • Requires large area for storage ponds. • Requires potable water (surface or ground) to blend with recycled water.

Frequently Asked Question:

Can Recycled Water Solve Our Water Supply Problems?

The City of Santa Cruz and Soquel Creek Water District need to diversify their water portfolios to ensure water system reliability and sustainability. In addition to their existing water supplies, conservation, curtailment, and the proposed 2.5 million gallon per day (MGD) desalination facility, both agencies have either implemented and/or are investigating recycled water opportunities.

Under current California regulations, highly-treated wastewater (recycled water) is not permitted for discharge into a potable water distribution system (otherwise known as direct potable use). While it may be used to provide irrigation water for parks, sports fields, and/or golf courses, this would require new dedicated distribution pipes that have shown to be prohibitively expensive compared with the relatively small volumes of water delivered. In addition, during drought conditions, water restrictions are established for outdoor irrigation and therefore recycled water would not meet the City’s potable water needs during these times.



Evaluation on watering Pasatiempo Golf Course with recycled water is underway.

Groundwater recharge is another possibility for indirect potable reuse;

continued on back

Recycled Water Regulations — What Does the Future Hold?

The production, discharge, distribution and use of recycled water are subject to federal, state, and local regulations, the primary objectives of which are to protect public health. In the State of California, recycled water requirements are administered by the State Water Resource Control Board (SWRCB), individual Regional Water Quality Control Boards (RWQCBs), and the California Department of Public Health (CDPH).

The regulatory requirements for recycled water projects in California are contained in the following sources:

- California Code of Regulations (CCR), which includes Title 22 and Title 17
- California Health and Safety Code
- California Water Code

Under current regulations, recycled water can be used only for irrigation or indirect potable reuse. A new Senate Bill (SB 918, Pavley) has been introduced that would require the State Department of Public Health to develop and adopt uniform water recycling criteria for indirect potable water reuse and investigate the feasibility of developing uniform water recycling criteria for direct potable reuse.

If future legislation is passed to allow for direct potable reuse, the City and District could evaluate the feasibility of converting the proposed desalination facility into a potable recycled water facility. The treatment process for recycled water and desalination both use reverse osmosis membranes.

To view a white paper on recycled water visit www.scwd2desal.org/Page-Documents.php

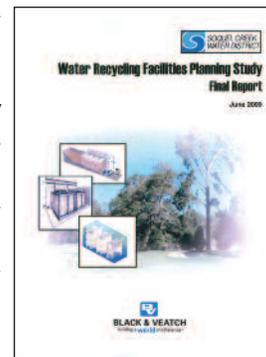
“FAQ” continued...

however, it is not practical for the City or the District because of current requirements that 1) recycled water be blended with at least 50 percent potable water before recharge and 2) extraction by any public or private drinking water well occur at significant, state-defined distances from the point of recharge.

The City of Santa Cruz evaluated indirect potable use (Carollo, 2000) and concluded the plan had very limited viability as a drought supply due to a number of factors including the limited size of the aquifer, treatment and blending requirements, water rights constraints and required storage time. The available water supply was estimated to be approximately 200 million gallons per year (MGY), compared to needed supply of approximately 500 MGY. Currently, the City is currently looking at supplementing Pasatiempo Golf Course with recycled water from Scotts Valley Water District.

For the Soquel Creek Water District (SqCWD), use of recycled water from the Santa Cruz wastewater treatment plant is limited by a small irrigation market within the District’s service area and the long pipeline that would be needed to move water from the treatment plant to the District’s service boundary (about five miles).

*Final Report
on Satellite
Reclamation
Plants for Soquel
Creek Water
District is
available at
www.soquel-creekwater.org*



SqCWD does not currently treat or reclaim any wastewater. However, new technology using satellite reclamation plants (SRPs) to treat wastewater may have limited applications within the District and was recently evaluated (Black and Veatch, 2009). The concept is to divert wastewater from the sewer system for local treatment to provide recycled water for large-scale irrigation. Preliminary estimates do not look economically feasible considering a potential SRP for the District would save 134 acre feet per year (AFY), less than 10 percent of the needed water supply, and the cost to produce recycled water could be upwards of \$7,300 per acre foot.

The City and District will continue to evaluate ways to diversify their water portfolios with recycled water; however, it alone cannot solve our water supply challenges.

Glossary

Recycled Water: Wastewater that has been purified through advanced secondary or tertiary treatment. Recycled water is permitted for most non-drinking water purposes (non-potable) such as landscaping, irrigation and industrial uses as well as groundwater recharge (indirect potable).

Indirect Potable Reuse: Recycled water is blended with another water source (ground, surface or storm water) and stored (either injected into a groundwater aquifer or in detention ponds) and treated for potable use.

Direct Potable Reuse: Either the injection of recycled water directly into the potable water supply distribution system downstream of the water treatment plant, or into the raw water supply immediately upstream of the water treatment plant.

