

In-depth coverage of the California drought. Always noise-free, always trustworthy. [Learn more about us.](#)

WATER DEEPLY

CONNECT WITH US [t](#) [f](#)

[Executive Summaries](#) [Articles](#) [Op-Eds](#) [Background](#) [Search](#) [About](#)

ARTICLES Q&A

Share 89

Tweet

[Subscribe for updates](#)

California Eyes Recycling Wastewater for Drinking

The state is currently investigating whether it is feasible to develop standards for direct potable reuse, which would allow treated wastewater to be sent direct to customers for drinking without first being stored in a reservoir or aquifer.

Never miss an update.

Sign up for our newsletter to receive weekly updates, special reports and featured insights as we cover one of the most critical issues of our time.

Enter your email address

SUBSCRIBE

WRITTEN BY
Tara Lohan

PUBLISHED ON
 Jul. 15, 2016

READ TIME
Approx. 7 minutes



Jason Dadakis of the Orange County Water District talks about the water filtration system at their water treatment plant in Fountain Valley, Calif. In 2015 the facility expanded to produce 100 million gallons (375 million liters) of water each day. [Chris Carlson, AP](#)

CALIFORNIA'S DROUGHT HAS spurred interest in treating wastewater for drinking. For decades, some areas of the state, notably Orange County, have resorted to indirect potable reuse – treating wastewater to drinking water standards, but then filtering it back underground to mix with groundwater before pumping it back out for drinking.

Related Articles

Making the Most of Wastewater

August 1st, 2016

Recycled Water Key to California's Water Security

May 24th, 2016

New Regs Aim to Make Water Recycling Easier

June 17th, 2016

2015: The Year Recycled Water Became Cool

January 24th, 2016

Confessions of a Wastewater Operator

February 18th, 2016

How California Could Reinvent the Water Sector

July 4th, 2016

Wastewater Becomes a Resource in Silicon Valley

April 4th, 2016

Wastewater Creates Energy, Products – and More

April 12th, 2016

But now the State Water Resources Control Board, prompted by the legislature, has tasked a panel of experts with determining whether it is feasible to develop criteria for direct potable reuse (DPR) – where wastewater is treated for drinking and then piped directly to customers without first being mixed in a reservoir or groundwater aquifer.

The panel is set to deliver its report later this month, as is a group of stakeholders. Then staff from the Water Board's Division of Drinking Water will use those two reports to develop their own recommendations on the feasibility of DPR criteria by September 1. After a 45-day comment period a finalized report will be submitted before the end of the year. If, as is most likely, the final report does find that the criteria are feasible, the Division of Drinking Water will begin work on developing the appropriate regulations for direct potable reuse.

To better understand the factors at play in the report and the possible future of potable reuse in California, Water Deeply spoke to Jeffrey Mosher, executive director of the National Water Research Institute, who is the expert panel's administrator.

Water Deeply: You are part of the expert panel that has been convened. Who else participates in that and what are you tasked with doing?

Jeffrey Mosher: The expert panel weighs in on the idea of if it is feasible to develop DPR criteria in California. What we mean by that is, can we develop regulations that are protective of public health?

So the expert panel is made up of a lot of researchers and PhDs and academics, and the idea is that they are on the cutting edge of a lot of the research and understanding in the field. There are also particular backgrounds represented – epidemiology, toxicology, chemistry, microbiology, risk assessment – and a lot of those are public health related.

Water Deeply: Why is there a push now to look more closely at DPR?

Mosher: We've done a lot of indirect potable reuse (IPR) but in order to do IPR you need an environmental buffer – a groundwater

basin or a large surface water reservoir. Many communities don't have that.

DPR provides some additional operational flexibility. For example, your wastewater comes out of a treatment plant, but your groundwater basin or reservoir may be far away or it may be already full. Or it may not be large. So having DPR gives you a lot of more flexibility for potable uses.

Water Deeply: Are there places already doing DPR that we can look at for best practices?

Mosher: It's practiced in Windhoek, Namibia, in Africa. And there is a DPR facility in Big Spring, Texas. These communities hit a wall – they literally ran out of water and it was the only water supply they had left.

In California the drought has put pressure on our traditional or existing supplies, whether it's surface water or groundwater. Potable reuse, including DPR, provides a lot of advantages in the sense that it's local – you don't have to bring it in through a long pipeline or aqueduct.

Typically it's water you control. You already have it so you don't have to pay a lot of money to obtain water rights or to buy water on the market. Frankly, the other reason it is so attractive is that it's so reliable; it's going to be there every day, year to year. Regarding our imported water, whether it's from the Colorado River or the State Water Project, there have been some issues on its availability, so that means it is not as reliable as it has been.

We have the technology to do DPR. What we are missing are the criteria or the regulatory approach on how it would be permitted.

Water Deeply: What are the risks or concerns in doing DPR?

Mosher: There are the same risks that are associated with IPR as well as traditional drinking water. It's just that because the source is wastewater, we have a lot more pathogens in there and potentially we have a lot more chemicals from things like cleaning products or anything that goes down a drain.

We still have pathogens in surface water, but with DPR they will be a lot higher, so we have to have appropriate treatment to address higher levels of pathogens, which we know how to do. And we need to be able to treat for the chemicals that are harmful – it's just something we have to manage.

We have treatments to remove them but they can occur at very, very low concentrations and we just need to be able to continue to study those to see if there is ever an issue with them.

Water Deeply: What have been some of the findings of the expert panel so far?

Mosher: Because we want to look at things like DPR there are some things we need to chase down, such as what are the best procedures from a treatment point of view, what are the technologies we need to consider, what are the appropriate water-quality standards. Monitoring is also a big part of it. We need to identify if there is off-spec [below standard] water and then have procedures to address that.

The technology is in place in some of the IPR plants, like the Silicon Valley Advanced Water Purification Center – reverse osmosis, ultraviolet, advanced oxidation – those are the advanced treatments that have the capability of removing chemicals and pathogens. We are learning a lot from those facilities that are already in place.



Engineer Elise Chen speaks in front of water purification containers at the Advanced Water Purification Facility in San Diego. The pilot project is part of a \$2.5-billion plan to recycle 83 million gallons (314 million liters) of wastewater a day for drinking by 2035. (Gregory Bull, AP)

The difference is, we may have to do some additional monitoring and we may need some additional operational considerations.

It's not just one process; you might have three or four in your treatment train. A lot of thought was put into what those treatment trains look like and how to ensure that they are reliable for producing water that's controlling for pathogens and chemicals.

Water Deeply: What is your sense of how the public feels about DPR? Are we ready for it?

Mosher: We have a lot of information suggesting that initially a community might be skeptical, that they'll have a lot of questions and may be adverse to the idea. There is information from San Diego and the San José area and Orange County that suggests once people understand the treatment and see the water quality that can be produced and understand that it's a local supply and it will increase water reliability, the acceptance rate can be 70–80 percent or higher within the community.

It takes some work. A community have to get their ducks in a row and do outreach and they have to gain that community's acceptance for the project. Most examples show that we can do that.

Water Deeply: Are there any water agencies that would be jumping on the opportunity if criteria are developed soon?

Mosher: There are agencies like Santa Clara Valley Water District that are actually putting DPR into their planning documents. These agencies don't do things overnight. They have their planning documents, that might be a five-year or longer plan. They will start assessing alternatives during that planning process.

Then as they move along, they might do a feasibility analysis of alternatives. We're seeing DPR in those types of studies from Santa Clara Valley Water District and Los Angeles Department of Water and Power.

However, there are more agencies, and these tend to be the smaller ones, waiting for this report to come out to determine the viability of DPR for their community. There are a lot of people just holding off.

Water Deeply: Do you think DPR will play a big role in California's water supply in the future?

Mosher: I do. If you think about it, what are our options? We are always going to be doing conservation. We will be doing more non-potable reuse, but that is very limited. The reason we do potable is that it is a greater opportunity for larger volumes of water.

We are going to see IPR where it can be done. And those places where it can't be done, they are going to be looking seriously at DPR. I would honestly say that just about every area of California is looking at some form of potable reuse.

Water Deeply: What else is exciting in the water reuse world?

Mosher: The next frontier is how to capture more stormwater for water supply. So to recharge groundwater basins, hold stormwater behind dams, create low-impact developments that not only capture water off a roof but then put that water into the groundwater supply through a dry well.

We really don't know how to do this well and there are a lot of institutional issues and barriers associated with doing it, and water quality issues. But it's the next frontier.

About the Author

Tara Lohan

Tara Lohan is managing editor of Water Deeply. She's been writing about the confluence of water and energy issues for more than 15 years and spent seven years as a managing editor at AlterNet. She's the editor of two books on the global water crisis and her work has been published by the Nation, Salon, the American Prospect and others. She holds a bachelor's in environmental studies from Middlebury College and a master's in narrative journalism from the University of Oregon. She tweets from [@TaraLohan](#) and lives in San Francisco.