# VOICE OF SAN DIEGO

By Rob Davis
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## A Guide to Purified Sewage

**Sam Hodgson**
Most of San Diego's sewage is treated at the Point Loma Wastewater Treatment Plant and then pumped into the Pacific Ocean.

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Flush your toilet in San Diego right now, and the overwhelming odds are that its contents will end up at the city's major sewage treatment plant in Point Loma, near Cabrillo National Monument, and then be discharged into the Pacific Ocean.

What you're flushing is wastewater, after all, so it gets thrown away like waste: It's treated and piped miles offshore to never be seen again.

In arid San Diego, though, that calculation is slowly changing. U.S. Environmental Protection Agency officials and local business and environmental groups are prodding the city to envision a future where sewage is considered a resource that's too valuable to waste.

San Diego currently reuses a small fraction of its sewage for irrigation. And it's currently studying a proposal that would purify more sewage and make it clean enough to be drinkable, a plan that could potentially boost city supplies by more than 20 million gallons a day -- enough to supply about 180,000 people annually.

But there are a lot of new terms, questionable claims and important questions about that effort. Here's a guide:

**What's the difference between the sewage used now for irrigation and the recycled sewage project the City Council approved?**

What the city uses now is called reclaimed water. It's sewage that's clean enough that it isn't brown any more. But it isn't so clean that you can drink it. So it's used for irrigation or in industrial cooling towers. It's distributed through purple pipes.

Recycled sewage, which we also call purified sewage, is cleaner than reclaimed water. It's sewage that's been treated enough to be safe for drinking. (Also not brown.) It doesn't need a separate set of pipes to distribute.

**What's the council studying and when will it be finished?**

The council's $11.8 million study of recycled sewage will:

• Study how long purified sewage would stay in the San Vicente Reservoir if it's piped there and determine the best place to put that pipe.

• Study the effectiveness of the purification process on a million-gallon-per-day test plant that starts operating next year.

• Pay for community outreach.

The final report is due in late 2012.

**Will the test plant be discharging into the drinking water reservoir?**

No. The city needs state health department permits first, and the City Council would have to approve any plan and find a way to pay for it.

**Wouldn't it just be cheaper to use sewage for irrigation and not clean it even more so we can drink it?**

Believe it or not, the city estimates that it'd be cheaper to purify sewage for drinking, even though it takes more energy.

Why? Because of the costs of installing the purple pipes needed throughout the city for its two reclamation plants to be fully utilized. Even though purified sewage has to be treated more than the reclaimed version, creating a second network of purple pipes is expensive. (The city's estimates are from 2006. It's in the process of updating them.)

**What about the ocean? Which is cheaper -- purified sewage or desalinated seawater?**

Purifying a gallon of sewage is cheaper than desalinating a gallon of seawater. Why? Because it takes more energy to strip salt out of seawater than crud out of sewage. They both use the same treatment process: filters, reverse osmosis and disinfection.

In the Orange County Water District, for example, it costs $800-$850 to produce enough purified sewage to supply two families of four for a year. The district estimates that a comparable amount of desalinated seawater would cost $1,200-$1,800. Energy costs drive those figures.

Costs can vary depending on how much related infrastructure is needed to get that water into the system and how much is produced. In San Diego, for example, a more than 20-mile-long pipe would have to be built between a plant in University City and the San Vicente Reservoir.

**Wait a second. Did you just say reverse osmosis?**

Yes indeed. Let me explain how sewage gets purified for drinking in a nutshell:

Sewage is first treated to the point where it's clean enough for irrigation: It's turned into reclaimed water. That then goes into a three-step purification process. The water is sucked in through filters that are like tiny straws. Then it's pulled through membranes that only let water molecules through. Then hydrogen peroxide gets added and the water gets blasted with ultraviolet light.

**And you can drink what comes out the other end?**

Yeah. It's water. Scientists say it's cleaner than our existing sources. First, though, it gets mixed in with existing sources and is then treated again like all tap water is before it goes to the tap.

**Really? How clean is purified sewage? What about the yuck factor?**

The water that would be produced from San Diego's purified sewage plant would be cleaner than what we're currently getting from the Colorado River and Sacramento Delta, our two main supplies, which get discharges from sewage plants and farms.

"There's no question about that," said James Crook, an environmental engineer who serves on a scientific panel advising San Diego's study. "Clearly, it's superior to your existing water supply."

**Do others do it?**

Yes. Orange County has a similar system to what's proposed in San Diego. A key difference is that Orange County stores the water in an underground aquifer and San Diego would store it in a reservoir. The residents of Fairfax County, Va., have been drinking purified sewage since 1978. Singapore also recycles its sewage for drinking.

**What about traces of pharmaceuticals that Mayor Jerry Sanders keeps fretting about?**

There aren't any pharmaceuticals in the water, scientists say. They get removed to levels that can't be detected. In fact, purifying sewage would do more to ensure that tiny traces of pharmaceuticals stay out of the water than our current treatment does. San Diego's three existing tap water treatment plants aren't required to remove traces of pharmaceuticals -- they're unregulated.

**Is purified sewage safer than the water we get from the Colorado River and Sacramento Delta?**

Scientists believe it is. Shane Snyder, a drinking water scientist at the Southern Nevada Water Authority, which supplies Las Vegas, said planned purified sewage plants like the one being considered here are safer than situations where it's unplanned -- like in the Colorado River.

"The people of San Diego are going to drink reused water one way or the other," Snyder said. "Whether they control it or take it from current sources, it's going to be there. I have no doubt that the systems that San Diego is considering and that Orange County uses are safe from a scientific perspective."

By Snyder's estimates, about 10 in every 100 gallons of the Colorado River are sewage, which is discharged from cities upstream like Las Vegas. (San Diego has estimated it at 17 in every 100 gallons.) Snyder figures that three in every hundred gallons of the Colorado are Las Vegas' treated sewage.

**If the mayor is worried about pharmaceuticals from purified sewage, is he also worried about pharmaceuticals in our current drinking water supplies, which contain sewage?**

Seems like a logical conclusion, but the mayor isn't concerned about pharmaceuticals in our current supplies, a spokesman said.

The mayor, who's opposed earlier efforts to purify sewage, has softened his stance lately. He supports the council's pilot study. But he wants to see its results before he'll support a bigger project, spokesman Alex Roth said.

"When you're at a personal comfort level that the scientific evidence is overwhelming that this is safe, then you can feel comfortable supporting it," Roth said. "We're talking about the drinking water for a million-plus people."

**If purifying sewage is so safe, why does the city have to do a pilot study?**

Two key reasons. One, the city needs state approval first. Two, the city needs public acceptance.

"It's something that has to be done," said Crook, the environmental engineer. "You can't just build a full-scale plant without demonstrating that it'll produce the quality you want. It makes sense to do a demonstration study -- and it is advantageous from a public perception standpoint."

**Didn't some federal panel say purified sewage should only be a source of last resort?**

Yes. A 1998 National Research Council report said that. Crook was the chairman of the panel, which is reconvening to produce a report expected next year.

Crook said the earlier report had been misused by those who've opposed purified sewage and didn't argue against purifying sewage.

Snyder, who's on the panel producing the new report, said the line from the 1998 study would "live in infamy."

In the decade since then, he said, scientific and technical knowledge has advanced. Data from existing purification facilities in Singapore and Orange County have also boosted understanding.

"The technology has come of age," Snyder said, "so it's more reliable and less costly than before."