

Smart Meters, The Opposite of Green

Award-Winning New Film, *Take Back Your Power*, Urges Revolt Against Threatening Device

BY JEROMY JOHNSON
AND REGINA MEREDITH

Throughout the developed world, utility companies are rushing without informed consent to install wireless “smart” electrical meters on homes and businesses. To the surprise of the utility companies, a global resistance has developed against smart meters. On one side of the controversy are the corporations and governments who continue to say that smart meters are safe and who insist that we should just trust their “modernization” plans. On the other side is a growing chorus of independent scientists, doctors, privacy and legal experts, whistleblowers, injured people, and concerned citizens pushing back against smart meter programs.

To get to the bottom of this controversy and to find out exactly why so many people are against smart meters, filmmaker and transparency advocate Josh del Sol spent the past two years making a documentary about smart meters. *Take Back Your Power* is an eye-opening film that has already won multiple awards, including the Indie Fest Annual Humanitarian Award and the AwareGuide Transformational Film of the Year Award.

The film looks at the reasons why there are now over 200 anti-smart meter organizations around the world. The issues include privacy, surveillance / NSA data extraction, smart meter fires, hacking and electrical grid vulnerability, property rights, increased customer bills, time-of-use pricing, lack of energy savings, and health impacts.

The following are just some of the issues discussed in *Take Back Your Power* and within the emerging anti-smart meter community.

The NSA, Surveillance, & the Constitution

Edward Snowden revealed how much the NSA knows about us from email, cell phone, and other communications data. He also showed us how technology companies are somewhat complicit in this surveillance. What is not often mentioned is that smart meters are an integral part of this surveillance network. Utility companies will maintain that your data is secure. However, if Google cannot protect your data from the NSA, do you really trust PG&E to? Furthermore, utility companies and commissions have even admitted they are seeking to market the data harvested by all smart meters on our homes.

What few people realize is that the next phase of the “smart” grid is for every appliance in your home to be connected wirelessly to your smart meter. Not only will this fill your home with microwave radiation (at much higher levels than currently exist), but it will also allow your utility to know when you are home, what your activities and habits are, and how many people are in your home at any given time. To take things further, there are plans to fit RFID (radio-frequency identification) chips even on food products that will be designed to transmit to your “smart” refrigerator,

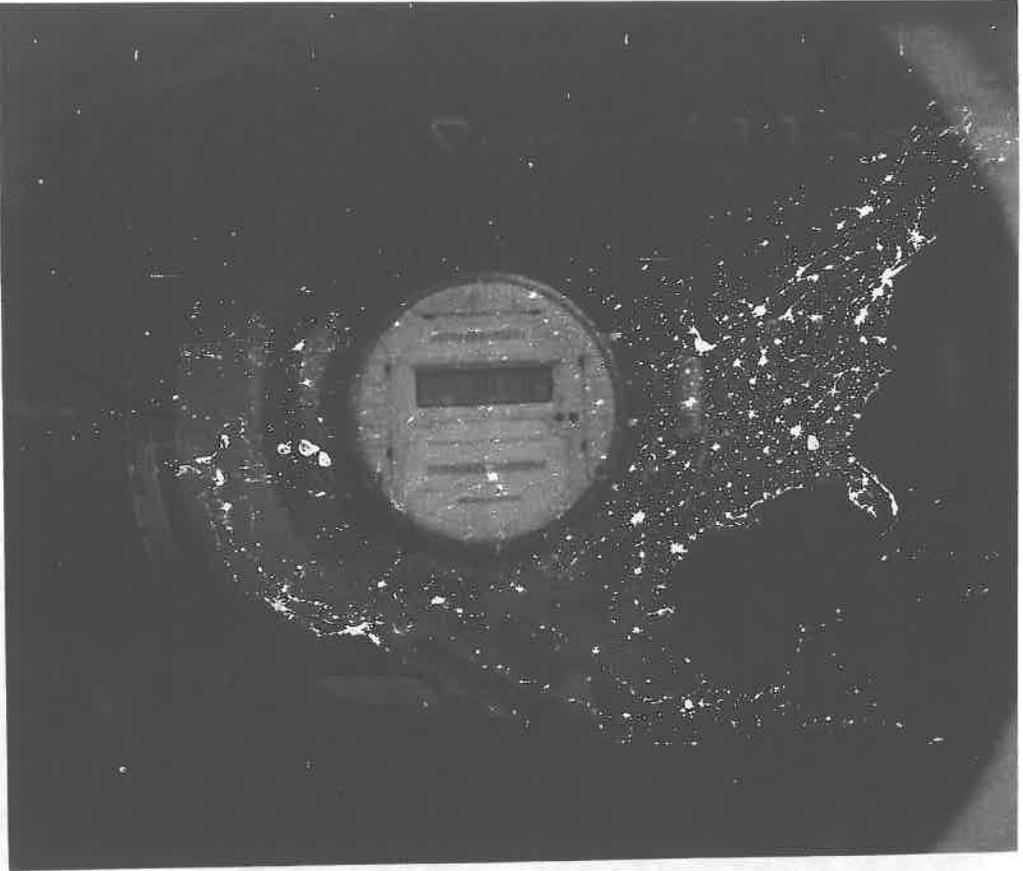
which will transmit to your smart meter which will send the data to PG&E, which will then sell the fact that your milk is expired to your cell phone carrier, which will send you a grocery store coupon for milk on your smartphone!

This may sound like a wonderful, futurist world of convenience straight out of a *Jetsor* episode. However, for many people this is dystopian horror show where corporations and governments have unfettered access to our lives. This push for ever more data may be good for technology company profits and for organizations like the NSA whose mission is surveillance, but is it good for society?

We must ask ourselves what it will mean for democracy and personal freedoms if we do not have basic privacy within our own homes. The smart meter programs are a direct violation of the Fourth Amendment to our Constitution which protects us in our homes from unreasonable search and seizure. This would place the utility companies and governments above the Constitution.

The “Internet of Things”

The next supposed wave of the Internet called the “Internet of Things.” Smart meters are a major component of this because they are the gateway into our homes. The Internet of Things is a push by technology companies to connect everything we own to the Internet wirelessly. They are selling this idea as a cost



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venience because you will never lose your car keys and can turn off your oven from your smart phone.

However, there are two major problems with this idea.

First, any semblance of privacy and personal freedom will be gone. Google (which just purchased Nest, a "smart home" company, for \$3.2 billion) and other major technology companies, PG&E, and the NSA will have increasing amounts of data about you. If you are concerned about privacy and surveillance

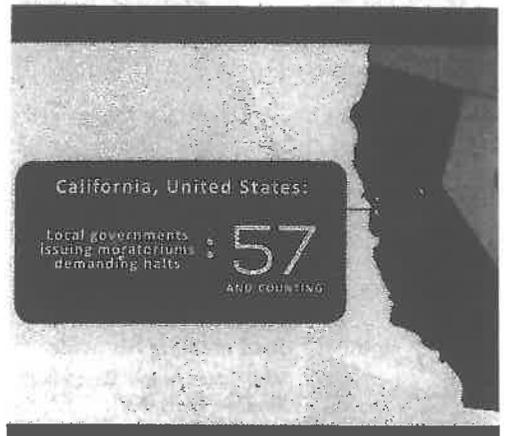
studies) that shows that microwave radiation damages biology. Thus, if the technology companies of Silicon Valley get their way, we will be needlessly filling our homes, our children, and ourselves with what is a potent toxin according to science, while industry and government tells us it is safe. Does this remind you of tobacco, asbestos, and DDT?

Are Smart Meters Actually Green?

Have we all been fooled? In our drive to adopt any technology that promises to reduce our carbon footprint, we have blindly accepted that the solutions will not create even bigger

wife of Google Chairman Eric Schmidt, is on the NRDC board. As noted above, technology companies, including Google, stand to make immense profits from the Internet of Things and from connecting everything wirelessly through devices such as smart meters. Thus, NRDC support for smart meters may not just be about saving the planet. It may be that it is simply good for business.

Potential conflicts of interest and advertising budgets aside, are smart meters really a green technology? The experts interviewed in *Take Back Your Power* say they are anything but. In fact, many smart grid pilot studies have



now, wait until everything you own and most of your activities are connected wirelessly to the Internet.

According to a 2012 Congressional Research Report called *Smart Meter Data: Privacy and Cybersecurity*, "with smart meters, police will have access to data that might be used to track residents' daily lives and routines while in their homes, including their eating, sleeping, and showering habits, what appliances they use and when, and whether they prefer the television to the treadmill, among a host of other details."

Second, how do you think all of these things magically connect to the Internet? The answer is with pulsed digital microwave radiation that is already considered by the World Health Organization (WHO) to be a possible carcinogen. Many scientists say that with current scientific data, microwave radiation should be considered a *probable* carcinogen, with some even stating that it is a *definite* carcinogen. Furthermore, there is a wide body of independent scientific research (many thousands of

problems. This is particularly evident with smart meters.

Five years ago, utility companies like PG&E started to advertise their new smart meter programs as a green technology. (It was around this time that \$11 billion of stimulus funds were allocated for utilities to install smart grid technology, according to *Time* magazine.) Utilities spent millions to shift public perception and to financially support local environmental organizations. This financial support, and the perception that technology is the primary solution, may be the reason why much of the environmental community in the Bay Area still see smart meters as a green technology. However, that perception is beginning to shift.

Another reason we are led to believe that smart meters are green is that major environmental organizations, such as the Natural Resources Defense Council (NRDC), are big proponents of smart meters and the smart grid. What is interesting about the NRDC, however, is its connection to the technology industry. For example, Wendy Schmidt, the

shown that smart meters do not save energy and may actually increase energy usage.

In fact, Northeast Utilities, which provides electricity to more than three million customers in New England, broke ranks in January and admitted that "there is no rational basis for this technology choice."

Furthermore, it is becoming widely understood that it is anything but green to fill our homes and communities with the pulsed digital microwave radiation that smart meters emit. How can a technology be considered sustainable if its byproduct harms not only humans, but plants, insects, and animals?

It is now time for the Bay Area community to realize that smart meters are not a green technology. Better solutions exist, and the current way forward is unsustainable. It will be much more effective to spend resources to localize and decentralize our power generation (solar), utilize basic energy reduction techniques, and use inexpensive, off-the-shelf technology to monitor our utility use—for the very small percentage of people who actually check their energy use.

Smart Meter Health Effects

Have you been experiencing headaches, sleep issues, fatigue, tinnitus and/or heart palpitations? Have you had a chronic condition sud-

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denly accelerate its pace or have infections that seemed particularly virulent? If so, you are not alone. Almost everywhere smart meters have been deployed, a percentage of the population begins to experience these symptoms (usually without even knowing that smart meters have been installed). These people may indeed be the canaries in the coal mine.

These symptoms are commonly labeled as a condition called electro-sensitivity (ES). In California alone thousands of people have experienced a plethora of health conditions once smart meters were installed and have had their lives completely changed. In Sweden, where ES is officially recognized and where wireless technology was first implemented, nearly 300,000 people are affected. Doctors and biologists around the world have stated that this is what happens when people are exposed to the microwave radiation and electrical pollution ("dirty electricity") that smart meters emit.

Of course, corporations such as PG&E say that smart meter emissions fall well below the supposedly "safe" levels that the government requires. However, what they fail to tell you is that the FCC guidelines are incredibly obsolete and do not cover long-term, low-level exposures from smart meters and other wireless devices. In fact, the guidelines only address the issue of protecting us from the heating of bodily tissue. This is an absurd idea and an outright lie considering what the current science shows us about the biological impacts of microwave radiation. See for yourself that most of the independent science shows deleterious biological effects from this type of pollution: EMFanalysis.com/research.html.

Take Back Your Power goes deep into the health effects of smart meters. One important thing to note is that doctors interviewed in the film state that even if you are not consciously aware of any effects caused by smart meters, blood tests show that they are triggering chronic inflammation in your body, which can lead to many illnesses. The considerable harm to health, rights, and security make it important to take action now.

How to Take Back Your Power

There are many effective actions we can all take to turn this tide. Here are some of the most important ways to grow awareness within your community:

- » Opt out of the smart meter program. You can do this by calling PG&E at 866-743-0263 and request that they put a safe analog meter back on your home.
- » As many people in California have done,

do not consent to or pay the opt-out fees. The legality of the fees has not even been determined by the California Public Utilities Commission. For some unknown reason, they have been delaying this legal decision for over two years. Paying to keep your health and rights can be called extortion. Send PG&E a registered letter telling them you do not consent to this change of terms in your contract with them, and will not pay any fees for keeping your analog meter. There are letter templates at FreedomTaker.com.

- » Encourage your neighbors to opt out. This will create a community that is free of smart meter radiation and electrical pollution. Throughout California entire communities are smart meter-free, and 57 local governments have adopted ordinances against smart meters. Many buildings in the Bay Area have had all of their tenants opt out together. Organize this for your building or community.
- » Share this information with your neighbors and even with your PG&E repairman or meter reader. Initiate a conversation with your local government, which responds according to numbers and commitment within its constituent base. A good local resource for information is EMSafetyNetwork.org.
- » Attend or host a screening of *Take Back Your Power*. To watch the film online or on DVD, visit TakeBackYourPower.net. Subscribe to their newsletter to join the global movement to ban and recall smart meters. That is the ultimate solution for this ill-conceived program.

Special Bay Area screening: There will be a screening of *Take Back Your Power* on **Saturday, April 26, at 7 p.m.** at the Berkeley Fellowship of Unitarian Universalists, 1924 Cedar Street, Berkeley. Following the film, there will be a Q&A with the filmmaker, Josh del Sol. Donations will be accepted to support the cause. To reserve your seat for free, please visit: TakeBackYourPower.net.

Jeremy Johnson is a local safe-technology advocate with an advanced degree in civil and environmental engineering. Personally affected when smart meters were installed on his home, he went on to provide practical solutions for reducing electromagnetic field (EMF) pollution at his website, EMFanalysis.com.

Regina Meredith is a TV correspondent who is engaged in the smart meter battle in her town of Sedona, AZ. Her show, "Open Minds," airs on Gaiam TV, GaiamTV.com

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Water Everywhere But Not a Lot That's Recycled

Lawyers examining draft policy target liability, standards and accountability

BY LINDA RAPATTONI
Daily Journal Staff Writer

SACRAMENTO — Imagine flipping a switch to spray your lawn with water that you had flushed down the toilet a few months earlier, or filling a drinking glass with water with which you had showered.

Municipal water districts and sellers of recycled water would like to see this kind of thing happen in California, where a growing population and global warming are straining dwindling water supplies.

As state lawmakers began tackling water storage and supply problems in a special session of the Legislature last week, lawyers were examining a draft recycled-water policy at a State Water Resources Control Board workshop.

Attorneys for recycled water suppliers say their chief concern is liability. Lawyers for environmental groups, on the other hand, want to see accountability.

Under current law as interpreted by a couple of court cases, as long as water purveyors comply with the most recent water quality standards, they cannot be held liable for damages for water later found to be unhealthy in *Hartwell v. Superior Court* and *In re Groundwater Cases*.

But under the draft recycled-water policy, providers would face a much tougher standard, strict liability. That kind of liability does not require a showing of negligence or intent to harm.

"In my view, and it is shared by many lawyers who work for water agencies, that is not the law right now, and it is not good policy to have that sort of scheme," said David Aladjem, who specializes in water issues at Downey Brand in Sacramento and represents the Association of California Water Agencies.

"If a water district complies with the Department of Public Health standards and they are still liable, that's an expansion of existing liability," Aladjem said. "And it's a liability where you have no idea what will happen in the future. If you were a water district, would you use recycled water if you had any choice? Your answer is no. It's not going to encourage the use of recycled water."

On the other side, Linda Sheehan, a lawyer and executive director of California Coastkeeper Alliance, a nonprofit environmental group advocating for clean water, said the state should be ensuring recycled water doesn't pose health problems years from now.

"Folks generating recycled water want to be able to use it and are frustrated because they want to use it freely," Sheehan said. "We have to make sure it's clean enough for all uses. Just because a human can drink it doesn't mean a fish can swim in it. We don't want to create a problem like MTBE, where we didn't think these things through ahead of time."

MTBE, or methyl-tertiary butyl ether, was added to gasoline in the 1990s to help it burn



"Just because a human can drink it doesn't mean a fish can swim in it," said Linda Sheehan, a lawyer and the executive director of California Coastkeeper Alliance, standing in front of Lake Merritt in Oakland, which is affected by East Bay Municipal Utility District's water recycling program.

failing to use it could be unconstitutional.

Employing potable domestic water for purposes such as irrigating landscaping is an unreasonable use of water prohibited by the Constitution if recycled water is available as an alternative, according to Water Code Section 13550. The water would have to be offered at a reasonable cost and could not be harmful to plants or animals or degrade existing water quality, however.

The state's water agencies recycle 500,000 acre-feet of wastewater annually — almost three times what it did in 1970, according to the California Water Plan, an information and data bank for planning water uses. One acre-foot of water equals 326,000 gallons, enough to provide for two families in a year, according to the Association of California Water Agencies.

The state's goal is to recycle 1 million acre-feet by 2010.

It hopes to expand recycling so that water which is used for non-potable purposes like flushing a toilet or showering can go through three levels of treatment, then be pumped back into the ground for natural filtering.

By establishing statewide guidelines, the state water board hopes to promote more water recycling. Nine regional boards each have their own standards for water sources. Some say that makes it difficult to build new water recycling projects.

"We partnered up with the Upper San Gabriel Valley Water District to take some of the water from Los Angeles County and clean it up," Kightlinger said. "The project took 10 years to get through the process, and it's just watering a couple of parks. It's a very frustrating thing."

He said his agency strongly supports the water board's establishment of "good sound guidelines" encouraging the use of recycled water and helping to avoid jurisdictional battles.

At the same time, California and Texas are the

"We need a policy that's thoughtful," she said. "We've degraded our existing water quality a lot already."

California Coastkeeper Alliance wants recycled water users to get a federal permit assuring compliance with the Clean Water Act in case recycled water unintentionally runs off into surface water. Recycled water advocates disagree.

"A federal permit kind of stops customers," said Roberta L. Larson, a Sacramento partner with Somach, Simmons & Dunn, who represents the Water Reuse Association. "They think, oh, I'm not sure if this really is good water. You're focusing on a nonproblem there for minor amounts of runoff."

The association is a nonprofit group that promotes water recycling, and its members include municipalities, water districts and agencies, federal and state agencies and various individuals.

Of even bigger concern, Larson said, is that a permit violation would open a violator to private-party lawsuits, unlike state law that regulates groundwater uses.

Environmental groups and recycled-water purveyors also disagree on the level of monitoring required to prevent degradation of groundwater. Recycled water has higher salinity levels than potable water.

Environment Now has tried to act as mediator in the dispute, said Josh Basofin, the group's freshwater program manager.

Mark Gold, president of Heal the Bay, said environmentalists were disappointed that the draft policy does not deal with the degradation issue.

"To be largely silent on it is not productive," said Gold, whose group focuses on clean water in Southern California and Santa Monica Bay.

The organization wants to see strict standards to trigger analyses of whether recycled water was degrading local groundwater supplies.

The Water Reuse Association believes that kind

STORM

Continued from page 1

bring with it future building permit stoppages.

Despite this new urgency, the state Senate on Oct. 9 failed to negotiate a unified ballot strategy to plug holes in the delta's delivery system after the debate fell apart along traditional party lines. The failure for now leaves the state without a plan to quickly react to future shortages, in the face of potentially massive threats to the water supply.

A further threat to water security in the state could include a future Wanger ruling on salmon and steelhead that could lead to further restrictions on the amount of water that can be pumped from the delta, said Rex Hime, president and chief executive officer of the California Business Properties Association.

Other threats, such as a sudden delta earthquake or the more gradual effects of climate change, also concern Hime.

"I'm not even talking about addressing future growth — we need to maintain our quality of life," he said. "We need new water for environmental purposes, to fix the flows in our streams. We need to mitigate for global warming."

Dam Investment

Preserving that way of life for the 25 million Californians who drink delta water means putting a measure on the ballot to fund infrastructure improvements — and that's where the dam broke during Oct. 9 legislative discussions.

Republicans insist the voters need to be presented with a proposal that includes billions of dollars in funding for new surface storage reservoirs, and the state should pay for the water it releases to meet environmental mandates.

"You cannot solve this problem with just conservation," said Sen. Dave Cox, R-Fair Oaks. "Sooner or later this Legislature has got to take the lead."

Meanwhile, Democrats back a proposal that focuses more on conservation and water recycling, and contains no specific funding for dams. They balked at the high level of state spending for dams that would benefit fewer water users, contending private or local government capital and user fees should be used to fund water projects.

"Who benefits from Sites, or Temperance Flat?" asked Perata, naming dams and reservoirs proposed to be built under the government's plan. "Whoever's going to benefit ought to step up and say, 'We'll give you \$2 an acre-foot.'"

Lawmakers needed to agree on a proposal by Oct. 16 to have that proposal appear on the February 2008 ballot. Instead, they have begun work to get two separate initiatives on the ballot, a prospect that worries Hime, who said he wants to see new funding for water storage.

"I can absolutely guarantee you, if there are two water initiatives on the ballot, it will go down to defeat," he said.

Lawmakers can still get a compromise measure on the February ballot, possibly as a supplement to the other measures. Perata said he wants a measure on the ballot to prove to the judge that California is trying to address its water woes. If the legislative attempt fails, the privately supported ballot measures likely would go on the ballot in November 2008, well after this water year comes to a close in September.

Last year's water year closed Oct. 1, ranking as the state's 18th-driest year on record. Department of Water Resources scientists who track

Environmentalists want to see restrictions on development, even though a 2001 law holds that developers can't construct large projects unless they prove there's sufficient water available. Past measures sought to apply those restrictions to smaller projects or other types of development than those covered by the law, she said.

One bill pending in the Legislature, Senate Bill 821, by Sen. Sheila Kuehl, D-Santa Monica, originally applied the water provisions to smaller subdivisions, but was amended to require state researchers to study whether to apply the measure to smaller subdivisions. Debate over the matter could restart when the California Legislature reconvenes in January 2008.

Kuehl also wrote the 2001 law, Senate Bill 221, which requires assessment of water supply before the construction of residential projects larger than 500 dwelling units.

SB221 in turn could provide new fodder for entitlement-process challenges to these large-scale developments during the current water shortage, according to Ray E. McDevitt, partner in the public agency section at Hanson, Bridgett, Marcus, Vlahos & Rudy LLP. Under the terms of SB221, local jurisdictions assess whether they have sufficient water to meet residential needs.

Project opponents may begin challenging the adequacy of these water assessments, according to McDevitt, who has helped agencies craft their assessments. The water shortage could prompt challenges to new projects, in addition to the usual California Environmental Quality Act challenges to the adequacy of a projects' environmental-impact assessment. The assessments also could lead to challenges from developers, the attorney predicted, as more and more communities tell the developers they don't have enough water.

"There's no doubt there will be friction," he said.

But courts traditionally have sided with the local governments in these types of cases — just as they historically have protected jurisdictions' right to institute building moratoria in the event of a water shortage, he said.

"Courts are more likely to side with the analysis if it was done right," he said.

Climate Change Water Bill Return Likely

As McDevitt readies his defense, Assemblywoman Lois Wolk, D-Davis, plans to reintroduce legislation requiring consideration of climate change in all water supply and water quality planning. Wolk also expects to propose streamlining delta oversight, an idea that could lessen regulatory red tape in the Sacramento and San Joaquin areas.

"I want to take a second look at governance in the delta," she said. "There are 220 agencies with some oversight there."

However, Wolk said she was not taking up an effort by environmentalists to mandate CEQA consideration of a project's emissions on water quality. Her measure only is supposed to set mandates for water agencies, not for projects.

The CEQA idea was suggested by Planning and Conservation League activists during a September joint State Water Resources Control Board and DWR meeting on climate change. Proposed in a Sept. 13 letter by Matthew Vander Sluis, PCL's climate change program manager, the idea could add a new facet to current CEQA discussions.

"[Water boards] should ensure that the environmental review includes alternatives analysis of various pollution prevention measures and compares the greenhouse gas emissions associ-

Legal Clouds Ahead for Water Users

Legislation, litigation pose development threats

But water-sensitive building designs about can't cure the delta, which provides water to about 25 million Californians. Visualizing themselves as architects of a potential solution, lawmakers and lobbyists — including representatives of the commercial building and multifamily sectors — are scrambling to fund billions in needed improvements.

The state's water future looks especially bleak after a September order from U.S. District court Judge Oliver Wanger cut back delta pumping, which the judge said endangers the delta itself. The order has prompted several water agencies to warn of potential customer cutbacks.

"There could be, beginning as early as 2008, water rationing going on," said Senate President pro Tempore Don Perata, D-Oakland, who warned that rationing could



due to delta coming could lobby surfaced building to Jeffrey Heiler, president of the California Building Industry Association in San Francisco.

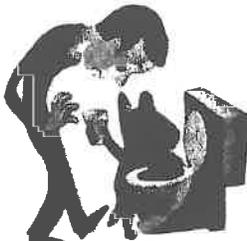
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It's Time To Drink Toilet Water

RECYCLING SEWAGE IS SAFE AND EFFICIENT, SO WHY AREN'T WE DOING IT?

By Eilene Zimmerman

Posted February 14, 2006 10:00 AM ET



Officials in Orange County, Calif., will attend opening ceremonies today for the world's largest water-purification project, among the first "toilet-to-tap" systems in America. The Groundwater Replenishment System is designed to take sewage water straight from bathrooms in places like Costa Mesa, Fullerton, and Newport Beach and—after an initial

cleansing treatment—send it through \$490 million worth of pipes, filters, and tanks for purification. The water then flows into lakes in nearby Anaheim, where it seeps through clay, sand, and rock into aquifers in the groundwater basin. Months later, it will travel back into the homes of half a million Orange County residents, through their kitchen taps and showerheads.

It's a smart idea, one of the most reliable and affordable hedges against water shortages, and it's not new. For decades, cities throughout the United States have used recycled wastewater for nonpotable needs, like agriculture and landscaping; because the technology already exists, the move to potable uses seems a no-brainer. But the Orange County project is the exception. Studies show that the public hasn't yet warmed to the notion of indirect potable reuse (IPR)—or "toilet-to-tap," as its opponents would have it. Surveys like one taken last year in San Diego show that a majority of us don't want to drink water that once had poop in it, even if it's been cleaned and purified. A public outcry against toilet-to-tap in 2000 forced the city of Los Angeles to shut down a \$55 million project that would have provided enough water for 120,000 homes. Similar reluctance among San Diego residents led Mayor Jerry Sanders to veto the city council's approval in November of a pilot program to use recycled water to supplement that city's drinking water. (A similar plan failed once before in 1999.)

But San Diego is in the midst of a severe water crisis. The city imports 90 percent of its water, much of that from the Colorado River, which is drying up. The recent legal decision to protect the ecosystem of the San Joaquin Delta in Northern California—San Diego's second-leading water source—will reduce the amount coming from there as well. Add to that rising population and an ongoing drought, and the situation looks pretty bleak: 3 million people in a region that has enough water, right now, for 10 percent of them.

We don't have enough water where we need it; if we don't learn to deal with drinking toilet water, we're going to be mighty thirsty. Only 2.5 percent of the water on Earth is freshwater, and less than 1 percent of that is usable and renewable. The Ogallala Aquifer—North America's largest, stretching from Texas to South Dakota—is steadily being depleted. And Americans are insatiable water consumers—our water footprint has been estimated to be twice the global average (PDF).

The ocean provides another source of potable water. Large-scale treatment of seawater already occurs in the Middle East, Africa, and in Tampa Bay, Fla. Construction of the largest desalination plant in the western hemisphere is supposed to begin this year in Carlsbad, Calif., which would convert 300 million gallons of seawater into 50 million gallons of drinking water each day. Taking the salt out of ocean water sounds like a good idea, but it's economically and environmentally far more expensive than sewage-water recycling. Orange County water officials estimate desalinated water costs between \$800 and \$2,000 per acre-foot to produce, while its recycled water runs about \$525 per acre-foot. Desalination also uses more energy (and thus produces more greenhouse gas emissions), kills tiny marine organisms that get sucked up into the processing plant, and produces a brine byproduct laced with chemicals that goes back into the ocean.

What desalination doesn't have, though, is the "yuck" factor of recycled sewage water. But seawater, like other sources of nonrecycled water, is at least as yucky as whatever comes through a toilet-to-tap program. When you know how dirty all this water is before treatment, recycling raw sewage doesn't seem like a bad option. Hundreds of millions of tons of sewage are dumped into rivers and oceans, and in that waste are bacteria, hormones, and pharmaceuticals. Runoff from rainwater, watering lawns, or emptying pools is the worst, sending metals, pesticides, and pathogens into lakes, rivers, and the ocean. The water you find near the end of a river system like the Colorado or the Mississippi (which feeds big cities like San Diego and New Orleans) has been in and out of municipal sewers several times.

Whatever winds up in lakes and rivers used for drinking is cleaned and disinfected along with the rest of our water supply. Still, a recent analysis of San Diego's drinking water found several contaminants, including ibuprofen, the bug repellent DEET, and the anti-anxiety drug meprobamate. No treatment system will ever be 100-percent reliable, and skeptics who worry that pathogens in sewage water will make it past treatment and into our drinking water should worry about all drinking water, not just the water in a toilet-to-tap program. The fact is, supertreated wastewater is clean enough to drink right after treatment. It's been used safely this way (in a process known as direct potable reuse) for years in the African nation of Namibia. The EPA has

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conducted research in Denver and San Diego on the safety of direct potable reuse and found recycled water is often of better quality than existing drinking water. And although putting water into the ground, rivers, or lakes provides some additional filtering and more opportunities for monitoring quality, the benefits of doing it that way are largely psychological. In its 2004 report (PDF) on the topic, the EPA concluded that Americans perceive this water to be "laundered" as it moves through the ground or other bodies of water, even though in some instances, according to

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