Southern Nevada Water Authority

Communicating with the Public about PPCPs:

A Utility Perspective

J.C. Davis
Public Information

PPCPs: A Utility Perspective

To scientists, PPCPs are a topic of great interest. To the public, they are an issue of great concern.

Utilities are in the unenviable position of dealing with an issue for which there are far fewer answers than questions

The core question is simple: “Is my water safe to drink?”

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Today's municipal customers are already skeptical about tap water quality. Consider their exposure to:

Media reports

Supplemental water treatment system sales tactics

Rocket fuel chemical in drinking water

Source of perchlorate contamination in lake, wells not determined yet

By Mary Manning
LAS VEGAS SUN

Tests show that drinking water in Las Vegas contains a small amount of the rocket fuel booster known as perchlorate.

Montgomery Watson Laboratories of Pasadena, Calif., reported the finding this week to the Southern Nevada Water Authority, which had sent samples.

The origin of the perchlorate contamination is unknown, although from World War II through the late 1950s the fuel oxidizer was manufactured by two companies near Henderson and continues to be manufactured by one company there.

Lake Mead and treated drinking water samples both contained 11 parts per billion of the chemical, which is also found in fireworks and explosives.

There is no national standard for safe levels of perchlorate, but drinking water in San Bernardino County in Southern California has registered from between 5 and 216 parts per billion, with no known ill effects. There is no state "standard" in California, but a guideline has been developed that triggers concern at 18 ppb.

Medical literature indicates health effects, which include thyroid and bone marrow problems, would not occur at levels below 2,800 ppb.

California has problem

Concern over the chemical surfaced when some Northern California water wells showed perchlorate levels as high as 8,000 ppb, high enough to force water authorities to close wells used as drinking water sources.

Scientists pulled the local samples of drinking water from Saddle Island in Lake Mead, which is near both the intake pipe for Las Vegas' drinking water and the Alfred Merritt Smith Water Treatment Facility.

"There's no danger at the levels we're talking about," said David Rexing, SNWA treatment plant laboratory manager. "There are a lot of unanswered questions."

It will take many more samples before anyone can know the source, Rexing said.

"There's no danger at the levels we're talking about. There are a lot of unanswered questions."
David Rexing
Water authority official

Montgomery Watson also found perchlorate in two Las Vegas Valley wells recharged during the winter with Colorado River water. Levels of 5.6 ppb and 13 ppb were recorded at the wells, whose specific locations were not released. Montgomery Watson is one of four laboratories in the country able to detect perchlorate.

Artificial recharge wells inject the treated river water into the groundwater basin and produce a mixture of groundwater and treated river water to meet peak summer demands.

Eight other wells from the area did not detect perchlorate. Of the 10 total wells tested, five pump groundwater only and five have been used for artificial recharge. Only recharge wells indicated perchlorate.

Two in-valley pumping stations, Broadbent and Fayle, that carry treated surface water, registered at 7.6 ppb and 9.6 ppb.

The Nevada State Division of Environmental Protection will take the lead on tracking the source of the perchlorate.

"We're taking this very seriously, but it will be a difficult task," said Allen Biaggi, deputy administrator of NDEP.

The Los Angeles Metropolitan Water District first tested Lake Mead near Hoover Dam, finding 8 ppb of perchlorate. It also discovered the same level at its drinking water intake pipe in Los Angeles.

That prompted the Southern Nevada Water Authority to conduct tests of its own.

Treatment expensive

Perchlorate cannot be removed from municipal drinking water, even in treatment plants as sophisticated as those in Southern Nevada. The only way to remove it is through riverse osmosis or ion exchange, both advanced treatments considered non-conventional and very expensive for municipal water systems.

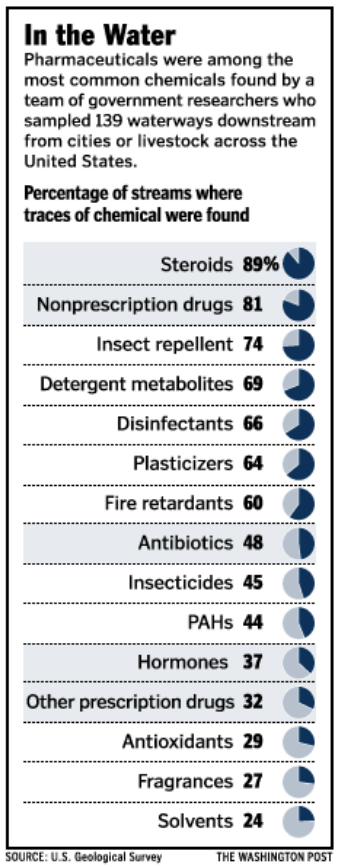
The Los Angeles district also tested water upstream of Lake Mead, but found no detectable levels, prompting speculation from water engineers that the perchlorate could originate from the manufacturing sites in Henderson.

American Pacific Corp., which suffered a major explosion and fire in 1988 at its manufacturing site near Henderson, moved its operation to Cedar City, Utah, where another explosion rocked the plant last month.

Kerr McGee Corp. is the only plant remaining near Henderson that manufactures perchlorate. It stores the chemical at Apex.

American Pacific President and Chief Executive Officer John Gibson denied that practices at either plant caused water contamination. Terrence Clow, 46, who worked at the American Pacific plant from 1971 to 1973, however, said workers routinely dumped contaminated water into the desert east of the plant.

Rexing agreed that it was too early to place the blame for contamination on any site. "We have very few samples to work with," he said.



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Generally, the public also has difficulty with the concept of relative concentrations:

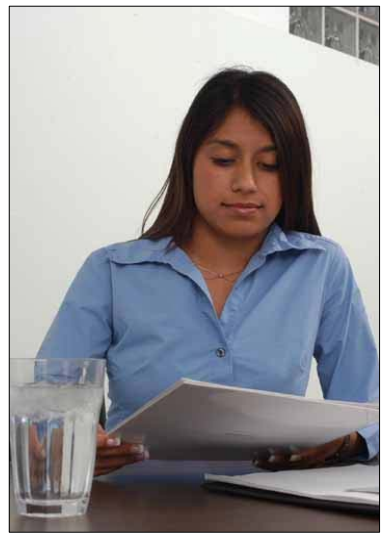
Instead, they apply the “present/absent” litmus test

Adverse health effects are presumed if a contaminant is present

Micrograms per liter

Nanograms per liter

Picograms per liter



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Advances in technology—the ability to detect contaminants in parts per trillion or even parts per quadrillion—have exacerbated public concern about tap water safety

The value “zero” is rapidly disappearing from the scientific lexicon

Some people and organizations use newly “discovered” contaminants for their own purposes

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Many of these emerging contaminants are not regulated; hence, there is no safety threshold

In the consumer's mind, the default safety value is zero

Tap water should be "contaminant-free"

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This “presence without relevance” situation generates difficult questions

Can a municipal water agency treat to non-detect when detection limits are continually decreasing?

How many ratepayer dollars should be devoted to additional treatment if health benefits cannot be established?

Following the precautionary principle, to what level do you treat if “zero” is unattainable?

Should reducing already-minute concentrations of unregulated contaminants take precedence over basic water infrastructure needs?

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These undefined threats also:

Strengthen perceptual link between wastewater and drinking water

Add to perception of deteriorating drinking water quality, which given advancements in treatment is the opposite of reality

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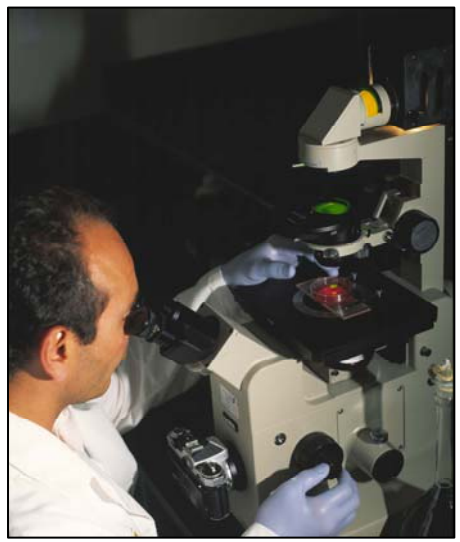
Utilities have a responsibility to help their customers understand these issues

In the absence of health effects information, conveying relative exposure is critical

Customers need to feel utilities (or the water industry) are taking this perceived threat seriously



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The first issue is best addressed by identifying other, easily recognizable sources of exposure

Phytoestrogen – Soy sauce

Ibuprofen -- Advil

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The “daily water consumption” equivalent of the contaminant at a given concentration should be compared to a single dose/serving of the alternate exposure vehicle to provide context.

“Exposure to dietary estrogens such as those found in soy products are estimated to contribute millions of times more estrogen to humans than drinking water containing trace concentrations of these compounds.”

“You’d need to drink hundreds of thousands gallons of water per day to get the equivalent of one Advil.”

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This comparison is not intended to discount the risk, but rather to provide some level of context in the absence of health effects information

Always use health standard comparisons when they exist

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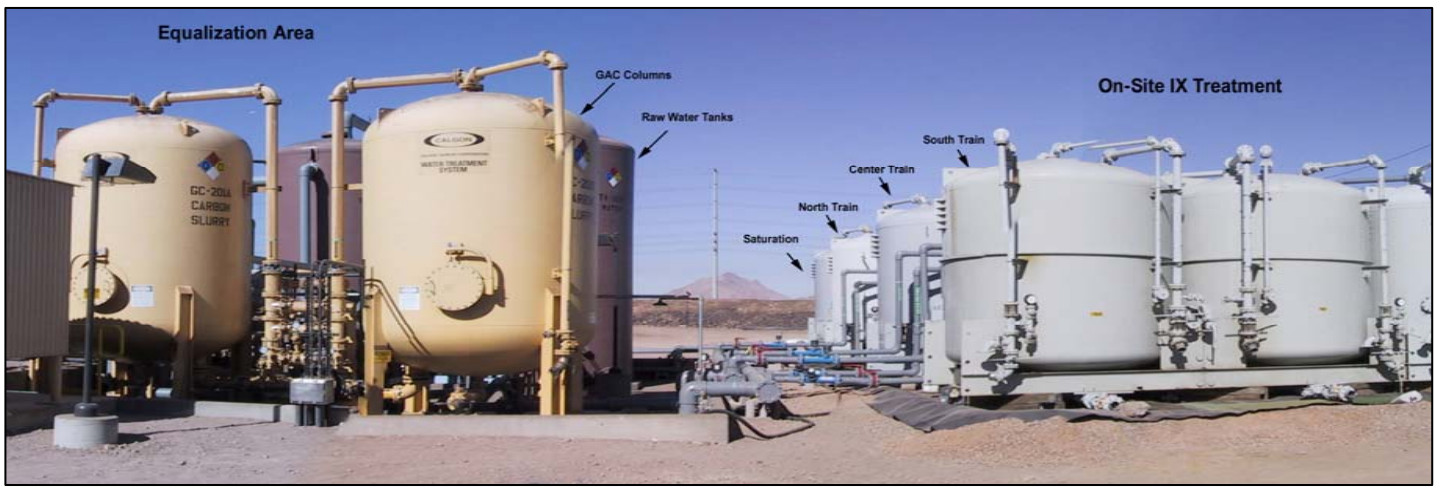
In terms of progress, the public is single-minded in that they simply want the contaminant removed

If the contaminant doesn't warrant removal, you must explain why

Never use "expense" as a reason to avoid additional treatment



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"Researching" and "evaluating" are considered bureaucratic jargon by the public. Statements of progress should always use everyday, non-academic language.

"We're trying to find out if these substances are harmful at extremely low concentrations."

"We're looking for the best way to remove these compounds."

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What do utilities need from the scientific community?

Health effects significance threshold

Treatment options (municipal and supplemental)

Alprazolam

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Although calls about such issues are infrequent, utilities should identify and prepare a primary contact to discuss the issue with customers

Public information officer

Technical staff

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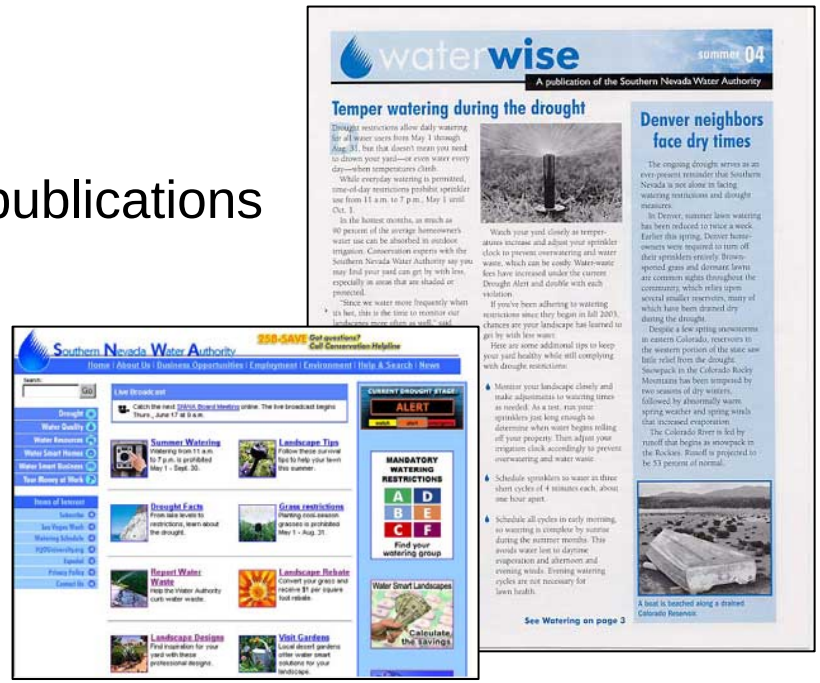
Utilities can also be proactive by communicating with customers about these issues before they appear in the local media (mainstream media often “lift” these stories from scientific journals)

Develop Web site text on topic

Include related article in agency publications



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By being proactive, utilities can convert potential crises into opportunities to build trust and credibility.

This can increase customers' receptiveness to risk communication messages

It can also mitigate customers' reaction to issues of high concern

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Questions?