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Drug traces found in O.C.'s water

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A two-year, \$300,000 study released today reveals that trace amounts of medicines, pesticides, plastics and even flame retardant are present in the water that flows into Orange County and eventually becomes part of the water supply.

While the amounts are far below any threshold that would raise health concerns, they could foreshadow a push for new water-quality regulations in years to come to control ever tinier levels of contaminants.

The levels found in the study are typically equal to one drop in 20 Olympic-sized pools.

But the drugs -- anti-convulsants, anti-inflammatory and anti-cholesterol medications, to name a few -- are there, passing through sewage treatment plants and into the Santa Ana River, or flowing from the [State Water Project](#) or the Colorado River.

The Orange County-based [National Water Research Institute](#) research group on Wednesday released the new report, which tracks 49 substances, known as 'constituents of emerging concern,' in our water supply.

The report says 27 of them were found in water that flows into Orange County, and they include far more than prescription drugs -- herbicides, plastic residue, insect repellent and flame retardant were also found in the study conducted by the [Orange County Water District](#) and the [Metropolitan Water District](#), the region's water wholesaler.

And, of course, there's caffeine, the most commonly found.

The idea behind the study is to begin to get a handle on a matter of growing concern: drugs as well as substances known as endocrine disruptors found in drinking-water, which could, in far larger quantities, have potentially severe effects.

"We're in the beginning, the early stages of looking at this," said Jeffrey J. Mosher, executive director of the National Water Research Institute. "A lot of work still needs to be done."

Part of the concern is that these substances can pass through sewage treatment plants. In a river like the Santa Ana, dotted with sewage plants in San Bernardino and Riverside counties, treated effluent makes up better than half the water that flows downstream.

It passes through the [Prado Wetlands](#) behind Prado dam, where some of the compounds are filtered out, then flows on downstream, where it is diverted into settling ponds in Orange County that allow it to percolate into the drinking-water aquifer deep underground.

The soil and sand it percolates through provide yet another filter for contaminants, but still, some of the contaminants could be reaching the aquifer.

"It's likely that some materials persist, while others are effectively removed by the soil-aquifer treatment," said Michael P. Wehner, assistant general manager at the Orange County Water District.

"By the time they get to the wells, they're either at much lower levels or non-detect," Mosher said.

The study looked at three of Orange County's water sources: the State Water Project, a system of reservoirs and aqueducts that carry water south, the Colorado River, a source of imported water that crosses four states; and the Santa Ana River with its source in the San Bernardino Mountains.

The most difficult part for the public, water officials say, will likely be keeping it all in perspective.

While the idea of drugs and other substances in drinking-water sounds frightening, the amounts found were so tiny they had to be measured in nanograms per liter. That's one billionth of a gram; except for caffeine, the highest levels reported were on the scale of hundreds of nanograms per liter.

We are talking parts per trillion -- a drop of dye in 13 million gallons of water, the water agencies say, or one second in 32,000 years.

The trace levels of pharmaceuticals, for instance, are millions of times smaller than the doses doctors prescribe so they will be effective in humans.

Investigations of such compounds in drinking water are so new that no government health standards exist yet to put them into context. So the water research group hired a consultants to assess any potential health effects.

Eventually, the water agencies expect that they will face new government regulations on these substances.

"You're probably looking two decades away at possible regulations being set," said Bob Muir, spokesman for the Metropolitan Water District. "We're at the forefront of this."

The most frequently found contaminant was caffeine, at up to 2,160 nanograms per liter. After that came the anti-convulsants carbamazepine and primidone, the antibiotic sulfamethoxazole, and TCEP, a flame retardant.

All five were among the 16 out of 49 compounds found in the Santa Ana River at Imperial Highway, where the river's water is diverted into settling ponds so it can percolate into the aquifer.

But a separate study by [Intertox Inc.](#), a Seattle-based consulting firm, found that the levels of all 16 were many times smaller than would be needed to present a health hazard.

Few people would be expected to drink Santa Ana River water straight, but if they did, each would have to consume between 82 and 2.4 million glasses a day, depending on the compound, to reach a level that would be considered a health-risk.

The substances are driven to such extremely small amounts in a variety of ways as they flow downstream: dilution, absorption, breakdown by sunlight.

"By the time they get here, they're in very low concentrations," said Melissa Dale, a chemist at the Metropolitan Water District.

An independent panel of eight experts who reviewed the study gave a unanimous verdict: no public health concerns for the substances at the amounts that were measured.

"I came away feeling this was safe for my children and grandchildren," said Jack Skinner, a retired Orange County doctor and water-quality activist who was on the panel.

Earlier work has shown possible connections between drugs and hormone-mimicking compounds in water

and feminization of fish at sea, but potential effects on wildlife were not part of the latest study.

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