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See McKenzie's toxins? Look closer. No, closer.

By Susan Palmer
The Register-Guard

If you want to find dangerous pollutants in the McKenzie River, you have to look very hard.

Such small amounts of certain pollutants—pesticides, creosote, and other toxic chemicals—are present in the river that water quality monitors needed a special technique to detect them.

As part of a long-term protection and monitoring effort, the Eugene Water & Electric Board wanted to get a more refined look at water quality in the river, which is Eugene's primary source of drinking water.

Previous water samples taken from some of the river's tributaries showed contaminants—likely from agricultural and forestry runoff, said Karl Morgenstern, EWEB's drinking water source protection coordinator. Groundwater stored in the volcanic rock of the Cascade Range also flows into the McKenzie and so dilutes the water that such contaminants weren't detectable using traditional sampling.

So EWEB teamed up with U.S. Geological Survey researchers to obtain more precise measurements.

They found creosote, the preservative used in railroad ties and telephone poles; DDT, a residual insecticide that hasn't been used in decades but persists in the landscape; a plastic softener; and a smattering of herbicides and insecticides.

But they had to look hard to find them.

Instead of pulling one-time samples for testing, researchers placed six specialized tubes in the river at three locations and let water flow through them for a month. Membranes in the devices caught and held contaminants passing through.

It's the difference between getting a snapshot and taking a video, said Kathleen McCarthy, contaminant hydrologist for USGS. McCarthy has done similar surveys with the equipment—semipermeable membrane devices and polar organic chemical integrative samplers—throughout the Columbia and Willamette watersheds.

EWEB left the six devices in the river from September to October, a time when two storms occurred and were likely to have washed contaminants into the water. A lab later spent months checking for dozens of different compounds.

What struck McCarthy as she reviewed the results: how clean the water was.

One common chemical that didn't turn up in the McKenzie: flame retardant, the ubiquitous coatings on everything from mattresses to computers that slow or block the ignition of fire. The polyprobinated ditheyl esters have shown up in many other tests of rivers, McCarthy said.

"We hardly saw any of them," she said.

Testing for contaminants can be tricky. Herbicides sprayed on land in the summer might not enter the river until autumn's first storms. And some contaminants, such as oils, don't bind well with water, so they won't be suspended in an easily detectable mix, USGS researcher Chauncey Anderson said.

It's the first time such devices have been used to sample a drinking water source, Anderson said.

While the samples tell researchers that the chemicals are present, just how pervasive they are requires some complex calculations. Researchers are still working on those conversions, but Anderson believes the numbers will be extremely low, on the order of parts per quadrillion.

Current standards for drinking water allow a range of chemicals that can only be detected at the parts per million or parts per billion level.

EWEB plans to continue testing the water as part of its effort to anticipate and plan a response before serious threats to the water can occur.

WHAT'S IN THE McKENZIE?

Mostly pure water. Here are some contaminants EWEB found:

Metolachlor: Herbicide that kills grass and broad-leafed weeds. Found at the water treatment plant inlet in an amount so small, it can't be quantified

Diethyl phthalate: Synthetic liquid used to soften plastics. Found at the water treatment plant inlet and at Cedar Creek in amounts ranging from 550 nanograms to 1,800 nanograms .

Endosulfan: Insecticide used in agriculture and also as a wood preservative. Found in unquantifiably small amounts at Cedar Creek and at 2.5 nanograms at Camp Creek.

Trans-Chlordane: Insecticide banned in 1988, but once commonly used for farm and home pest control. Found in unquantifiably small amounts at water treatment inlet and Cedar Creek, and at 1.9 nanograms at Camp Creek.

Fluorene: A chemical also known as a polycyclic aromatic hydrocarbon, found in creosote, heavy oils, coal tar, and roofing tar. Found at Cedar Creek and Camp Creek at 10 nanograms.

Full list: Can be found online at: or.water.usgs.gov/proj/EWEB/