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Tribune/Barry Kough University of Idaho environmental chemist and toxicologist Greg Moller has studied the contents of the wastewater at the new Moscow wastewater treatment plant and made some interesting discoveries.

Something's in the water; University of Idaho scientist says chemicals being flushed into wastewater have the potential to make girls out of boys

*By JOEL MILLS
of the Tribune*

MOSCOW -- Sex changes in salmon. Hermaphrodite frogs and oysters.

Alligators with small penises. Partially developed genitals in human males.

All of these problems could originate with what's flushed down the toilet every day, according to a University of Idaho researcher.

"We don't necessarily consider ourselves as polluters or having an impact on the environment every time we flush or every time we

put something down the drain," says environmental chemist and toxicologist Greg Moller.

A class of chemicals known as endocrine disrupters can exist in everything from birth control pills to detergents and antibiotic soap.

Up to 90 percent of the estrogenic substances in birth control pills can pass through the body relatively unchanged, Moller notes. And the triclosan antibiotic in many soaps is also an estrogenic substance.

Moller says municipal wastewater treatment plants have an excellent history in protecting the public health, but "they really weren't designed for some of the chemical compounds that modern science -- and specifically medical science -- is now throwing at them."

So Moller and other UI scientists have spent the last 10 years working on methods to remove these pollutants from wastewater.

Although he won't go into specifics in order to protect several pending patent applications, Moller says the new technology uses advanced oxidation techniques to chemically incinerate the compounds.

"It's similar to how a washing machine uses bleach to remove trace chemicals from dirty clothes," Moller says, although chlorine is not used in the process.

The water treatment technology created at the UI has been licensed to Coeur d'Alene-based Blue Water Technologies. Along with the UI, Blue Water has started construction on the Hayden Wastewater Research Facility at Hayden's wastewater treatment plant. It is due for completion in May.

Moller says the 3 million gallon-per-day facility will use four patent-pending technologies from the UI to start scaling up the treatment process and selling it to treatment plants nationwide.

Moller says the sky isn't falling, and human and animal males aren't going to suddenly start morphing into females.

But he cites several studies in polluted environments that appear to show a connection between estrogenic compounds and reproductive anomalies.

Researchers from the U.S. Geological Survey recently linked triclosan in Lake Mead in Nevada with sex changes in fish. The

lake is the water supply for Las Vegas.

A large national water survey found the same problem in 57 percent of its samples, Moller says.

And when a chemical messes with an organism's reproductive system, the chances it will successfully produce offspring is reduced.

"It's like when you give a male female hormones," Moller says. "He's not going to be real interested in going out on dates Saturday night.

"What we're seeing now is a bit of the canary in a coal mine. It's an indicator of potential outcomes we should be very concerned about."

UI fisheries biologist Jim Nagler found 84 percent of a sample of Columbia River salmon have genetic indicators that they changed from male to female before they were born, Moller says.

Nagler's research suggests such gender-bending fish could produce all male offspring, altering normal sex ratios.

But problems may not be limited to wildlife, Moller says. Other studies have examined the link between estrogenic compounds and breast cancer, testicular cancer and reduced sperm counts.

A Centers for Disease Control study found the rate of hypospadias in males had doubled in the last 30 years. Hypospadias is a birth defect where the urethra opens on the underside of the penis rather than the tip.

"In essence, male physiology is starting to look more like female physiology," Moller says, adding a relative of his has been diagnosed with the condition.

He says the increased rate of hypospadias may just be the result of better reporting, but he still thinks the trend is troubling.

"As a parent, this gives me great pause about the world that my kids are going to inherit. And as a scientist, I find this can be disturbing at the highest level."

> **What can you do?**

University of Idaho researcher Greg Moller advises not flushing

medication down the toilet or pouring it down the drain, even though that is often the recommended method of disposal.

Simply placing the items in the trash is an option, he says. The pharmaceuticals may still leave a landfill and enter the environment, he says, but at a much slower rate.

He also points to a new Maine law that establishes safe drop boxes for medications at firehouses.

When Moller made a presentation on his research to Idaho legislators during their tour of northern Idaho earlier this month, six approached him later, asking what could be done. He told them a similar law in Idaho would help.

Moller also encourages consumers to use community toxic waste disposal days.

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