

## **Frequently Asked Questions and Answers** to accompany the USGS news release “Negligible Amount of Pharmaceuticals Found in Northwest Oregon Streams” on August 25, 2009

### 1. Why were only 21 pharmaceuticals and metabolites sampled in this study?

Although thousands of pharmaceutical chemicals are produced and used, only a small subset of those most likely to be found was included in this study. The target compounds were selected based upon (a) their estimated national use, an important factor in determining which compounds are likely to be detected in stream water, and (b) the availability and performance of laboratory methods to detect these types of compounds. The target list includes a wide range of chemical classes and pharmaceutical uses, from analgesics and antibiotics to anticonvulsants, antihistamines, and stimulants ([see table 1 in the report](#)). Because the target list includes many of the most commonly used pharmaceuticals, this study represents a good first step in characterizing the presence of these chemicals in streams.

### 2. What are the sources of pharmaceuticals to streams?

Pharmaceuticals can enter local streams in a variety of ways. Sources include spills (such as dumping coffee residue [caffeine] onto the street), other accidental or illicit dumping, failing septic or sewer systems, the accidental and rare connection of sewer lines to the storm sewer system, poor management of pet and animal waste, and incomplete removal from wastewater treatment plant effluent. Pharmaceuticals are delivered to the local wastewater treatment plant via the sewer system from human excretion and flushing unwanted drugs down the toilet.

### 3. Are wastewater treatment plants designed to remove pharmaceutical chemicals?

Wastewater treatment plants typically are designed to remove solids, particulate materials, organic materials that consume oxygen when they decompose, and nutrients such as nitrogen and phosphorus. The effluent also is disinfected to eliminate health threats from bacteria and other biological vectors. Wastewater treatment plants are not designed to remove pharmaceuticals, but the treatment processes used to remove other organic materials may be effective in removing pharmaceuticals as well. The removal efficiency for each pharmaceutical chemical depends on its individual chemical properties and the types of treatment implemented in the treatment facility.

### 4. Is it okay to flush unneeded drugs down the drain?

No. It is not a good idea to dump unneeded pharmaceuticals down the drain because the local wastewater treatment facility is not designed to remove those drugs from the waste stream. The Oregon Department of Environmental Quality and EPA recommend that people dispose of unwanted and unused drugs with their household trash. Specifically, the federal guidelines recommend mixing the drugs with cat litter or used coffee grounds, placing that mixture into a sealable bag or a disposable container with a lid (such as a margarine tub), and putting it out with household trash. More information is available at: [http://www.whitehousedrugpolicy.gov/publications/pdf/prescrip\\_disposal.pdf](http://www.whitehousedrugpolicy.gov/publications/pdf/prescrip_disposal.pdf)

Drug “take-back” programs are an even better disposal option, although such programs are not yet widely available in the USA. A variety of partners are working to institute a statewide system that would put convenient and environmentally sound drug take-back programs in place for all Oregonians. A drug take-back event is planned for Portland, Oregon, on Saturday, August 29, 2009 at the Eastport Plaza Shopping Center; see <http://www.portlandonline.com/oni/index.cfm?a=256697&c=50738> for more information.

5. Do trace levels of pharmaceuticals in stream harm fish or other resident aquatic life?

Few studies have been conducted to determine the ecological effects of trace levels of pharmaceuticals on fish and other aquatic life, and more studies are needed. From the available toxicity data, however, it appears that the concentrations measured in this study, for several of the target chemicals, are low enough that they may not be harmful.

6. What can people do to decrease the levels of pharmaceuticals in local streams?

Several actions can be taken by citizens to decrease the levels of pharmaceuticals in local streams. Here are just a few:

- Don't flush unneeded drugs down the toilet; instead, participate in a drug take-back program or dispose of the unneeded drugs with your household trash (see question number 4 above). Find out if a drug take-back program is available in your area, and support the creation of such programs on a local or national scale.
- Don't discard your coffee-cup residue on the street – the next rain will wash it into the local stream.
- If you see any failing septic or sewer systems, notify the appropriate local agency so that the problem can be fixed.

7. Why were the Durham Advanced Wastewater Treatment Facility and the Tualatin River basin chosen for this study, and are the treatment facility results transferable nationwide?

The USGS and Clean Water Services have been collaborating on water quality studies in the Tualatin River basin since 1990. Clean Water Services is interested in learning more about existing and emerging threats to stream water quality in the local area, and pharmaceuticals represent one of those emerging threats. USGS collects data and performs research related to the quantity and quality of the Nation's waters as part of its core mission as the primary science agency in the Department of Interior.

Because of the relatively low summertime flow in the Tualatin River and the large number of people served by the Durham Advanced Wastewater Treatment Facility, any pharmaceuticals discharged with the Treatment Facility effluent are much easier to detect, compared to a smaller facility discharging into a larger river. The greater chance of detection increases the value of the research because the effects can be quantified.

Results from this research are transferable to many other treatment facilities across the Nation and around the world, as long as the treatment processes are similar to those used in 2002 at the Durham Advanced Wastewater Treatment Facility. Many other treatment facilities use similar processes, so the results should have value elsewhere.

8. Are any of the detected pharmaceuticals in this study on Oregon's interim final list of Priority Persistent Pollutants?

No. None of the detected pharmaceuticals in this study are on the interim final list from June 2009.

A related Frequently Asked Questions list was created for a USGS national study that included a similar list of pharmaceutical chemicals; it is online at [http://toxics.usgs.gov/regional/emc\\_faq/](http://toxics.usgs.gov/regional/emc_faq/). Some of that information also may be relevant to this study.