



# Clean Water Action

**TESTIMONY TO OVERSIGHT HEARING**  
**Joint Committee on Public Health**  
**Joint Committee on Environment, Natural Resources & Agriculture**  
**John McNabb, Clean Water Action**  
**May 13, 2008**

Good morning. My name is John McNabb, and I am the Director of Research and Policy for Clean Water Action New England. I am also an elected member of the Cohasset Board of Water Commissioners.

Clean Water Action is a national environmental organization with over 30,000 members in Massachusetts. Clean Water Action has a long history of advocating for safe and affordable drinking water, of speaking out for the water consumer, both locally and at the state and national levels. We appreciate the opportunity to discuss with the Joint Committees at this Oversight Hearing the important issue of pharmaceutical contamination of Massachusetts's water supply.

**The situation** confronting us is as follows:

- Millions of drugs - pharmaceuticals and personal care products (PPCs) -- are sold and used every year.
- Pharmaceuticals get into the environment from disposal of unused drugs down the toilet, disposed of in solid waste landfills, through drugs not completely metabolized and also flushed down the toilet, and industrial uses such as animal feedlots.
- These pharmaceuticals are not removed by septic systems or wastewater plants and enter into the environment to contaminate groundwater and surface water. The USGS found one or more pharmaceuticals in 80% of 139 streams they tested in 2002.
- Detectable levels of pharmaceuticals, in the parts per trillion (ppt) have been found in numerous public drinking water systems all over the US, including Cape Cod.
- Many water treatment plants do not have the technology to remove pharmaceuticals from the raw water, which is one reason why they have been detected in tap water.
- We also know little about how these compounds degrade and react in the environment, during treatment and inside our bodies, as well as long-term exposure to multiple contaminants at low levels.

**Environmental effects.** What has been the environmental effect of this contamination?

- Adverse effects to aquatic ecosystems has been documented. For example:
- Exposure to the wastewater from a city sewage treatment plant cause endocrine disruption in male fathead minnows, according to a 2007 USGS study.
- Low levels of common anti-depressants, including Prozac, Zoloft, Paxil and Celexa, cause development problems in fish, and metamorphosis delays in frogs, according to Marsha Black, an aquatic toxicologist at the University of Georgia in Athens.

- Male fish living downstream from wastewater treatment plants have been observed becoming feminized in rivers and streams in the US and England.

**Human effects.** Well, since fish are exposed 24 hours a day to these chemicals it makes sense that they might be affected. But what about humans? Most observers conclude that the evidence is not there yet, and some surmise that at these very small levels of parts per trillion that there is no evidence to show there is a threat to humans. However:

- A mixture of 13 drugs at levels mimicking that found in rivers, when exposed to developing human kidney cells, slowed the growth of the cells by up to 30%, according to a 2006 study <sup>1</sup>by Francesco Pomati and others at the University of New South Wales in Australia.
- In a follow-up study<sup>2</sup> in 2007 they examined the interactions of various mixtures of the drugs to determine the effects of different combinations of the drugs. One of their conclusions was that four drugs (atenolol, bezafibrate, ciprofloxacin, and lincomycin) “may represent a potential hazard for particular human conditions, such as pregnancy or infancy, in case of chronic exposure via contaminated drinking water.”
- While these studies are considered preliminary, they should raise a red flag and change the tenor of this discussion – since they do indicate a possibility of adverse human impact from these very small quantities of pharmaceuticals in drinking water.

**Weaknesses in Current Regulatory Schemes --** There are no federal or Massachusetts state standards or even monitoring requirements for pharmaceuticals in drinking water or wastewater. Further, the nation’s current regulatory framework is so slow, narrowly focused and costly that it is unfit to address this problem. Even if some of the pharmaceuticals were to make it onto the next round of the SDWA CCL or UMCR the lack of a family of chemicals approach under SDWA means that both their occurrence and their cumulative and synergistic effects might not be taken into account.

Traditional wastewater regulations and systems are designed to treat microorganisms and nutrients, not pharmaceuticals and other organic compounds. Making matters worse, loopholes in the Clean Water Act permit industrial discharge into sewers in greater amounts than directly into surface or groundwater even though the sewer plants are not designed to manage such waste.

Advanced treatments such as ozonation, granulated activated carbon, reverse osmosis and nanofiltration membranes can remove significant amounts of pharmaceuticals but are expensive. Some states, engineering firms and water utilities are working together on pilot projects to explore treatment options. More research, as well as leadership from U.S. EPA, is needed to build on this and other projects and on the information base that USGS and others have begun.

To their credit, the Mass DEP, before the AP story broke, has been working on this issue with their Emerging Contaminants Work Group. They are already researching drinking water treatment to assess effectiveness in removing pharmaceuticals, supporting a research project with USGS to sample water from the Merrimack River, and taking other pro-active action on this issue. But, more needs to be done.

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<sup>1</sup> *Effects of a Complex Mixture of Therapeutic Drugs at Environmental Levels on Human Embryonic Cells*, Pomati, F., et. Al., *Environmental Science and Technology*, Vol., 40, No. 7, 2006, pp. 2442 – 2447.

<sup>2</sup> *Effects and Interaction in an Environmentally Relevant Mixture of Pharmaceuticals*, Pomati, F., et al., *Toxicological Sciences*, 102(1), 129-137 (2008)

**Actions Needed:** While we certainly need to learn more, we know enough to be concerned and take precautionary action:

**First,** prevention is needed. The federal government needs to explore options for better design of pharmaceuticals so that there is less impact on the environment, and less excretion of the drug or its metabolites. Pollution prevention and toxic use reduction must be vigorously pursued, especially in the reformulation of human and veterinary medicines at each stage of their life cycle. More work needs to be done in the area of Green Chemistry – which is being led right here in Massachusetts at UMass Lowell – to reformulate pharmaceuticals as much as possible to reduce their impact on the environment, such as making it so it degrades faster. The pharmaceutical industry needs to take the approach in the Safer Alternatives Bill (S-2451) now in House Ways & Means, and the Safer Cleaning Products Bill (H-2246), now in the Health Care Financing Committee, which is to conduct research for safer alternatives to toxic substances in products and where there is a safer alternative, to use it in the product.

**Second,** monitoring of pharmaceuticals needs to be increased, and these results should be made available to the public. We need more data on the presence and concentrations of pharmaceuticals in our rivers and streams and in our treated tap water, and this data should be provided to the public. Local water departments will need financial assistance to conduct the testing. In particular, we should require monitoring from potential wastewater sources of pharmaceuticals, such as sewage treatment outfalls.

**Third,** we need more information on proper treatment techniques for removing pharmaceuticals from both wastewater and drinking water. The Massachusetts Department of Environmental Protection should continue to help lead the way in research initiatives to expand our understanding of appropriate treatments. DEP should also incorporate any findings into its planning for future water system improvements.

Local water departments are already being required to update their treatment systems in coming years as new federal requirements for other contaminants come on line. As we modernize our treatment facilities we should examine the full range of threats to both human health and the health of aquatic species, including pharmaceuticals and incorporate this into the treatment plant upgrades -- even if no new or impending enforceable regulations are in the works for either ambient or finished drinking water standards – and encourage water departments to upgrade their plants to the highest state of the art standards. More state financial assistance will be needed to make sure this is done, and done equitably.

Research is needed into treatment technology upgrades that industrial dischargers, wastewater systems and drinking water utilities can use to remove drugs from water intended for consumption or other use – priority should be placed on pilot projects like New Jersey’s and the consideration of precautionary approach treatment techniques (requiring treatment in some instances even when presence and/or health impacts are not confirmed).

**Fourth,** we need to examine ways to prevent pollution of our waterways with pharmaceuticals. Massachusetts should require the pharmaceutical companies to establish programs to discourage the disposal of unused pharmaceuticals in wastewater, and to encourage ‘take-back’ of these drugs (like the approach in the Computer Take Back in the E-waste bill, H-4570), even though such programs target a limited source of the problem. Monitoring efforts

should target waterways downstream from pharmaceutical manufacturing plants to determine if there are excess quantities of these chemicals in the discharges.

**Fifth**, we should support efforts at the state level to improve protections of the rivers and streams that supply our drinking water. Out of over 80,000 chemicals registered with EPA, our federal drinking water rules require testing for only 83. Like pharmaceutical contaminants, many chemicals are allowed to be discharged into our rivers, relying on drinking water treatment systems to hopefully remove them.

**Sixth**, action is needed on the state budget and legislation that will help address this problem. We call on the Massachusetts legislature and the Patrick Administration to:

- (a) Restore funding cuts in the DEP Drinking Water Program since 2001 to provide them the resources they need to study pharmaceuticals in water and to address other potential threats to the environment and public health from water contamination. Funding is also needed to allow DEP to do more work in identifying, testing, and evaluating more unregulated contaminants such as the national leadership they showed on Perchlorate.
- (b) Enact S-2292 to establish a Special Commission on Water Infrastructure that will develop a long range financial plan to help water districts statewide to address the estimated \$8 billion shortfall in funds needed for the drinking water infrastructure over the next 20 years. While most of these funds are needed for the distribution system, part of the shortfall is for upgrades to drinking water treatment plants and for protection of drinking water supplies. The has passed the Senate and is now in House Ways & Means.
- (c) Hold the proposed Reclaimed Water Regulations that are now in the public comment process until we can be assured that the discharge of treated wastewater into Zone IIs will not contaminate those drinking water supplies with unregulated contaminants – including but not limited to pharmaceuticals – that is in that wastewater. While it is important to recharge depleted aquifers, it may pose a risk to public health by allowing treated wastewater – which is now known to contain pharmaceuticals and most likely many other unregulated contaminants, to contaminate public drinking water supplies.

**Two final points.**

- We should ask our Congressional Delegation to support better federal support for research into addressing the pharmaceutical contamination problem. President Bush's FY2009 budget contains large cuts in the USGS budget including a \$10 million cut in funding for the National Water Quality Assessment program, and cuts in the toxics monitoring program that has been a major source of the data on this issue.
- Bottled water is not a solution, because it is less regulated than tap water, more expensive (200-10,000%) and is drawn largely from the same sources as public tap water supplies.

We appreciate the Legislature's interest in this important issue, and look forward to working with Legislators to help promote safer drinking water and cleaner rivers for all Massachusetts residents.

Thank you.