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Thank you Chairwoman Johnson and ranking member Boozman for holding this hearing and for the opportunity to speak on Maine's experience with emerging contaminants.

I would like to leave you considering the following:

- States do not now have sufficient information or resources to fully understand the human and environmental impacts of emerging contaminants in the waste stream and our waters.
- Carcinogen, reproductive or developmental toxicants, endocrine disruptors; persistent, bioaccumulative; very persistent and very bioaccumulative characteristics in certain substances suggest the need for caution.
- Removing toxic contaminants from different waste streams is the most effective pollution prevention strategy in many cases.

Maine's Experience: A Timeline

Maine's scientific and regulatory community has been looking at what we are now calling "emerging contaminants" for well over a decade. Unfortunately we have not had the resources for a comprehensive evaluation, and for that reason, what we don't know may be as illuminating as what we do know.

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In 1995, Dr. Beverly Paigen, a scientist at Maine's internationally renowned Jackson Lab, discussed endocrine-disrupting chemicals in a technical paper prepared for the Maine Environmental Priorities Project. Dr. Paigen wrote of concerns regarding biological impacts to humans and wildlife, including: increased incidence of testicular, prostrate, breast and ovarian cancer; decreased human sperm count; increases in congenital abnormalities of the male reproductive tract; and increases in endometriosis.

In the middle 1990s, drinking water from several private Maine wells was sampled for pollutants by DEP. The active substance in DEET insect repellant (diethyl tolumide) as well as a common pain reliever (ibuprofen), were detected in this well water sampled at several small town locations in Maine.[1]

At the end of the decade, the US Geologic Survey analyzed stream samples nation-wide for 95 compounds.[2] To follow up, EPA's Region I provided analytical support to those New England states interested in gathering data on local waters.
In 2002, Maine submitted samples from wastewater treatment effluent and the associated receiving waters in eight locations. The data from this small study, which screened for only 6 emerging contaminants, showed that a compound found in polycarbonate plastics and epoxy resins (bisphenol-A), an agent that kills bacteria and is found in soaps and cleaning agents (triclocarban), and an emulsifier used in detergents and pesticides (nonylphenol) were present in detectable amounts in a majority of both the effluent and receiving water samples. Detectable quantities of one or more of three estrogen-like compounds were also found in three wastewater effluents and in one receiving water sample.

In recent years in order to move beyond a chemical-by-chemical monitoring framework, we have undertaken a number of studies to evaluate overall environmental or human health impacts. All indications point to cumulative impact assessment of toxics being the most effective way to determine how we manage for the increasing array of compounds detected in our environment.[3]

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[1] Orrs Island in Harpswell (pop.5,239) and Oquossoc in Rangeley (pop.1,052)
[2] USGS Water-Quality Data for Pharmaceuticals, Hormones, and other Organic Wastewater contaminants in US Streams, 1999-2002
[3] Maine Surface Water Ambient Toxics Monitoring Program (SWAT) reports 2000-2007.

In 2005, Maine dedicated limited funding to study the presence of estrogenic compounds in effluent from three public treatment plants on the Penobscot River, a major river once renowned for its Atlantic salmon fishery. Effluent was found to be estrogenic.[4]

We have also funded several other studies to see whether fish populations are showing cumulative environmental effects from a range of emerging contaminants. To date, these screening level studies have not indicated endocrine-disruption or other effects. We will continue to invest state resources to develop additional capacity to continue monitoring using nationally and internationally recognized methodologies.[5]

In sum, we have dedicated resources to a number of initiatives to understand the degree to which certain chemicals are present in our waters and the impacts they may be having. Our knowledge of both, at present, is limited.

What is the Significance of Our Efforts to Date?

At the outset, it is important to note that while our data is sparse, it does show detectable levels of certain "emerging contaminants." That is a concern because, for example, most estrogens are known to exert effects at very low concentrations, in the parts per trillion range. Referencing this, it is significant that a USGS survey of more than 100 U.S. streams revealed that certain compounds in this category are present in the aquatic environment at sufficient concentration to exert biological effects on aquatic organisms.

Furthermore, we also do not know what the cumulative impacts from multiple chemical exposures may be. NIEHS (National Institute of Environmental Health Sciences) notes in their 2007 fact sheet that:
"Although limited scientific information is available on the potential adverse human health effects, concern arises because endocrine disrupting chemicals, while present in the environment at very low levels, have been shown to have adverse effects in wildlife species, as well as in laboratory animals at low levels.
The difficulty of assessing public health effects is increased by the fact that people are typically exposed to multiple endocrine disruptors simultaneously.[6] "

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[4] Maine Surface Water Ambient Toxics Monitoring Program (SWAT) FINAL REPORT 2006-2007 Monitoring estrogen active compounds in wastewater effluent and determination of novel biological effects in zebrafish (Danio rerio). Principal Investigator Greg Mayer, UM http://www.maine.gov/dep/blwq/docmonitoring/swat/index.htm

[5] Maine Surface Water Ambient Toxics Monitoring Program 2000-2007. http://www.maine.gov/dep/blwq/docmonitoring/swat/index.htm

[6] Example of a possible multiple exposure: The estrogen components of birth control pills are endocrine disruptors. Bisphenol A is also an endocrine disruptor and found in some plastic bottles and metal food cans. New information on

In addition, impacted populations can be difficult to predict. Let me use Maine's experience with mercury to illustrate my point.

Maine has been studying mercury since at least 1980. For years the conventional wisdom was that the primary health impacts from mercury derived from wildlife and people eating fish contaminated by mercury deposited from the air by rain or snow. In 2007 Maine's BioDiversity Research Institute surveyed the eggs of 23 species of Maine birds for contaminants. In addition to mercury, they detected flame retardants, industrial repellants, banned transformer coolants and banned pesticides in the eggs of all 23 bird species. Some of the bird species (red-winged blackbird, tree swallow) surveyed do not even eat fish.

In addition, fate and transport can be hard to predict. A 1991-2001 USGS pesticide survey of streams and ground water found organochlorine pesticides such as DDT in 94% of fish tissue samples and 24% of bed sediments in streams in non-agricultural areas with no development. DDT was banned in the U.S. in 1972 and in Maine in 1968, yet as of 2006, DDT was one of the constituents underlying 88% of the fish advisories issued in the U.S. including three rivers in northern Maine.

In short, there is a lot that we don't know when gauging the significance of our efforts to date.

What We Do Know

Fundamentally, there is an ongoing need for additional resources to conduct more comprehensive testing. But along the way we have observed that wastewater treatment plants are probably not the preferable primary tool to use to control the introduction of emerging contaminants into the environment. They are not designed to do so, and they clearly don't. Instead, we need to look to product stewardship initiatives such as take back programs.

In 2003, Maine was the first state in the nation to pass legislation authorizing a mail-in program for unused pharmaceuticals. Since then, many entities have worked through the details of such a program, addressing the concerns of drug enforcement officials as well as factoring in existing designations of many of these pharmaceuticals as hazardous waste under federal law.

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bisphenol A was reported on September 3, 2008 by the National Toxicology Program concluding that "current human exposure to the endocrine disruptor bisphenol A…is of 'some concern' for effects on development of the prostrate gland and brain and for behavioral effects in fetuses', infants and children…"

In 2007, with a $150,000 grant from the US EPA, the University of Maine's Center on Aging launched a statewide mail-in program for seniors that distributed 7,000 postage paid mailers to pharmacies around the state. The program expects to remove about 3,000 lbs of unused prescription medications from the waste stream.

Maine's experience can be replicated and expanded nationally. In May 2008, the international pharmaceutical company Roche[7] (which has multiple U.S. locations) noted that they have established financial incentives to ensure that unused or outdated products are returned by retailers and others in the supply chain. Their policies require that any returned or waste pharmaceutical product be incinerated rather than disposed of in landfills. Roche participates in pharmaceutical take-back programmes *in the EU and* supports the use of existing local take-back programmes in the U.S. as well as the implementation of a farther reaching program on the national level.

While the overall structure of the Clean Water Act does not inhibit our work on emerging contaminants there are other statutes that can better deal with this issue. Using the existing framework of setting water quality criteria for individual toxics is certainly possible, it is probably more effective to reduce or prevent substances of high concern[8] from entering the waste stream. Revisions to the Toxics Substance and Control Act (TSCA) to require a more thorough review of human and environmental toxicity of existing and new substances may be more effective than relying on the Clean Water Act.

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[7] Global Roche Position approved by the Corporate Sustainability Committee April 25, 2008. Hoffmann-LaRoche Inc. (Roche), based in N.J. is the U.S. prescription drug unit of the Roche Group

[8] Carcinogens, reproductive or developmental toxicants, endocrine disruptors; persistent, bioaccumulative and toxic; very persistent and very bioaccumulative