

Soil & Water Conservation Society of Metro Halifax (SWCSMH)

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To: **Regional Planning staff, HRM**
From: S. M. Mandaville Post-Grad Dip., Professional Lake Manage.
Chairman and Scientific Director
Date: June 04, 2005
Subject: **Endocrine disrupting compounds (EDCs) in the effluents of STPs (sewage treatment plants) with focus on those discharging into lakes and rivers (for submission at the Dartmouth High School workshop on June 06, 2005)**

(All our URLs are case-sensitive)

See our web page, <http://lakes.chebucto.org/INFO/EDC/edc.html>

Recommendation: Carry out scientifically defensible (and peer reviewed) assessments of the EDCs at the outlet of STPs draining into lakes and rivers. One of the most sensitive and common tools used to assess exposure to endocrine disrupting chemicals with estrogenic activity is the presence of vitellogenin (VTG), an egg yolk protein precursor, in the plasma of male fish. Recent studies worldwide have shown elevated plasma VTG in male fish downstream of sewage treatment plants (cf. ELA).

Rationale:

[I] Considerable evidence exists that aquatic organisms are being exposed to, and impacted by, a wide range of compounds that mimic hormones. Fish exposed to these compounds often exhibit an array of responses including depressed circulating sex steroid levels, reduced gonad size and fecundity, and males have become feminized.

Endocrine disrupting compounds (EDC's) are chemicals that either mimic endogenous hormones, interfere with pharmacokinetics, or act by other mechanisms.

The EDCs of prime concern here include bisphenol A (BPA), and ethinyl estradiol (EE2).

EE2 is one of the most commonly used active ingredients in oral contraceptives.

BPA is a plasticizer used in the production of numerous plastic articles, including the plastic lining of food storage cans and polycarbonate babies' bottles.

[II] Because many EDCs can only be partially removed with conventional water treatment systems, there is a need to evaluate alternative treatment processes.

The polychromatic medium-pressure (MP) UV radiation source was more effective for direct photolysis degradation as compared to conventional low-pressure (LP) UV lamps emitting monochromatic UV 254 nm radiation. However, in all cases the EDCs were more effectively degraded utilizing UV/H₂O₂ advanced oxidation as compared to direct UV photolysis treatment (*cf.* Rosenfeldt and Linden, 2004).