

## **Science & Technical Advisory Committee**

**Issue Paper 4, April 2008**

### **Management Effectiveness and Efficiency:**

#### **Assessment of Current Restoration Investments in the APNEP Region: Monitoring and Assessing the Concentrations of Emerging Contaminants from Point and Nonpoint Sources**

**Position:** The STAC encourages establishment of monitoring and research activities directed at assessing the occurrence of emerging contaminants in the environment and prioritizing those that appear to pose the greatest environmental hazards.

**Supporting Statement:** The occurrence of low levels of “emerging contaminants” (pharmaceuticals, disinfectants, pesticides, personal care products) can potentially endanger public and environmental health, and safety through causation of hormonal abnormality in a variety of organisms, leading to declines in animal populations as well as multiple toxic and carcinogenetic effects. Little data are available to assess their occurrence in the Albemarle-Pamlico basin and almost no data exists regarding risks posed to human, animal or plant populations. New analytical capabilities have allowed scientists to identify chemicals in the environment in extremely small concentrations.

Emerging contaminants (ECs) are those chemicals that have been shown to occur widely in the environment and have been identified as a potential environmental or public health risk, for which adequate data do not exist to determine this risk (Drewes and Shore 2001, Younos 2005). ECs are used every day in homes, on farms, or by businesses and industry and include household chemicals, fragrances, prescription and non-prescription drugs, personal care products, disinfectants, and pesticides. Results from recent research indicate that some of these compounds can act as endocrine disrupters and that they are present in municipal wastewater effluent at concentrations capable of inducing feminization in fish (Jobling et al. 1998, Kavanagh et al. 2004). Feminization has been linked to exposure to compounds that mimic estrogen activity. However, it has also been determined that thousands of compounds have the potential to interact with components of the endocrine system, altering the natural action of hormones (Drewes et al. 2006). The pervasive occurrence of antibiotics contributes to developing antibiotic-resistant bacteria. Recent outbreaks of methicillin resistant *Staphylococcus aureus* (MRSA) in Virginia and North Carolina underscore the impacts of pervasive low levels of antibiotics and the adaptive responses of bacteria that become resistant and potentially dangerous to the health of many organisms, including humans. There is evidence that some ECs are persistent in the environment and survive through conventional water treatment processes, creating a potential concern for public drinking water supplies (Drewes et al. 2003, Westerhoff et al. 2005).

ECs have been found to occur in surface and ground waters of the Nation, including North Carolina (Kolpin et al. 2002, Giorgino et al. 2007). There are currently no widespread monitoring activities in the APNEP region to evaluate the presence of emerging contaminants. Very little information is available on which compounds are the most prevalent. There is a need to assess their occurrence in the Albemarle-Pamlico region, particularly in estuaries and their feeder streams and lakes, to focus on identifying where aquatic organisms and human health might be at the greatest risk. APNEP support for water quality and ecological assessments is crucial for this first step. In addition, APNEP support for risk assessment studies for the most common and pervasive compounds found in the region will be necessary to evaluate whether and, if so, what regulations are appropriate to protect water resources. A workshop or committee on emerging contaminants, comprised of university, State and Federal health and environmental departments or agencies, could be used as a mechanism to

establish a meaningful program directed at evaluating and prioritizing emerging contaminant issues in the Albemarle-Pamlico basin.

## References

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