CANADIAN INSTITUTE FOR ENVIRONMENTAL LAW AND POLICY

L'INSTITUT CANADIEN DU DROIT ET DE LA POLITIQUE DE L'ENVIRONNEMENT

Since/depuis 1970

130 Spadina Avenue Suite 305
Toronto, Ontario M5V 2L4

Tel: (416)923-3529
Fax: (416)923-5949
www.cielap.org
cielap@cielap.org

Thirteenth Regular Session of the Council of the Commission for Environmental Cooperation (CEC) – June 28 2006

Summary of Remarks by Maureen Carter-Whitney, Research Director of CIELAP, the Canadian Institute for Environmental Law and Policy

For more than 35 years, the Canadian Institute for Environmental Law and Policy, also known as CIELAP, has worked towards shaping environmental law and policy and increasing public knowledge on a wide range of environmental issues, with a strong focus on sustainability. CIELAP's current research and education focus is on emerging and neglected environmental issues that require attention from government policy-makers.

In support of the Puebla Declaration, the CEC Sound Management of Chemicals Working Group is planning to identify and address emerging issues related to chemicals, including issues related to specific chemicals, categories of chemicals, waste streams (e.g. chemicals in products) and industry sectors and technologies (e.g. nanotechnology).

As part of this exercise, the CEC should ensure that it uses its processes to address specific emerging contaminants. CIELAP urges the CEC to broaden SMOC's work to address emerging contaminants, and in particular two categories of emerging contaminants. The first category includes pharmaceuticals, personal care products and endocrine disrupting substances, and the second category includes materials created through innovative technologies such as nanotechnology and biotechnology.

<u>Pharmaceuticals, Personal Care Products and Endocrine-Disrupting Substances</u>

Pharmaceuticals are defined as "chemical substances which alter the physiological state of living organisms." They are playing an increasingly important role, not only in human medicine, but also in veterinary medicine, aquaculture, and for disease prevention and as growth promoters in animal husbandry.

Pharmaceutical use by humans has increased enormously in the past half century. For example, in 2004 in the United States, almost half of all Americans were taking a prescription drug.

The use of drugs in veterinary medicine, farming practices, and aquaculture has also grown. Not only are drugs used for therapeutic purposes, but hormones and sub-therapeutic doses of antibiotics are used in animals as growth promoters.

- These emerging contaminants get into the water when they are discharged, discreted and discarded into wastewater.

Testing for emerging contaminants in water only began in the late 1990s. Much of the testing has been in Europe and the United States. Emerging contaminants have been found virtually everywhere.

The physical fate of these contaminants varies greatly, depending on the substance. Many are removed by wastewater treatment but some contaminants are persistent, even surviving drinking water treatment.

The use of antibiotics can lead to antimicrobial resistance. Endocrine disrupting substances birth control pills and synthetic hormones and in soaps and shampoos) whose effects are to disrupt the endocrine systems of living organisms. Endocrine-disrupting substances can mimic or block the action of natural hormones, or otherwise interfere with hormone production, release, transport, metabolism, or elimination. In humans and other large mammals their health effects are not yet well understood. In fish, birds, and other wildlife, effects have included reproductive impairment or failure, deformities and feminization. Such research is suggestive, but cannot tell us with certainty about effects on people. Many more animal studies, along with clinical research and statistical trends and patterns will be needed before there is a widely accepted consensus about human health impacts.

A number of governments, including Canada, the United States, and the European Union have begun initiatives to investigate and determine what to do about the hazards and risks of AMR and EDSs. In general, it is better and cheaper environmental policy to restrict potential pollutants at the earliest possible stage. For some substances, this means not using them in the first place, or at least curtailing the amounts used. We need scientific information to develop legislation and regulations especially for EDSs – research is the most vital need overall.

<u>Materials Created Through Innovative Technologies</u>

Emerging applications of nanotechnology and biotechnology also introduce the potential for the release of contaminants into the environment. Although these engineered materials may differ from our traditional understanding of “chemicals,” they may have toxic properties and it may be appropriate to manage them as such.

Nanotechnology involves techniques that manipulate materials on the scale of atoms and molecules. The building blocks for nanotechnology are simply the chemical elements and compounds which make up all materials. However, substances at the nanoscale have very different properties, such as changed colour, elasticity, strength, chemical reactivity, and electrical conductivity, from those they have in everyday human experience at the

macroscale or even the microscale. Nanotechnology is about developing ways to use and control these novel properties.

Buckyballs (also called fullerenes, and technically referred to as nano-C60) are an example of a nanomaterial. They were discovered in 1985 and are hollow spheres of 60 carbon molecules.

Toxicity studies on engineered nanoparticles are now underway. In general, substances at the nanoscale are more reactive and toxic than at the micro- or macro-scale. Tissue damage to lungs, brains and hearts has been found in animal species exposed to nanomaterials, and there are concerns that nanoscale particles may be able to penetrate barriers in the body that exclude larger particles.

A 2004 report on nanoscience and nanotechnology by The Royal Society and The Royal Academy of Engineering in the U.K. stated that almost nothing is known about the behaviour of nanoparticles in environmental media, and recommended that until more is known, the release of manufactured nanoparticles and nanotubes into the environment be avoided as far as possible.

There has as yet been little research on ecological effects, but a 2005 study of buckyballs in the environment discovered that they are toxic to soil bacteria, and that in water they clump together, forming nanoparticles that are soluble, a strange property since buckyballs individually are insoluble.

There is also concern about potential dangers of nanobiotechnology or synthetic biology if engineered "biological machines" are released into the environment – as they might be for environmental remediation or to mitigate climate change, for example. Possible hazards related to control or misuse of such synthetic life forms have not been addressed.

Biotechnological applications such as genetically engineered trees, plant molecular farming and genetic use restriction technologies also have potential to result in a wide range of adverse environmental effects. For example, the escape of genetic traits from genetically engineered trees could have severe consequences – escape of the low lignin gene could lead to forest trees with lowered protection against herbivores, insect attacks and storms. In another example, pollen from genetic use restriction technology plants could contaminate and kill seeds of other nearby plants.

CIELAP wishes to draw attention to these emerging contaminants and encourages the CEC to address these concerns in future SMOC work when identifying issues and setting priorities in relation to chemicals of mutual concern that will take place in the form of the proposed Strategies for Catalyzing Cooperation.