



Toxic Chemicals Update

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TOWN OF SHEDIAC NEW BRUNSWICK BANS PESTICIDES

The town of Shediac is leading the way in pesticide bans in New Brunswick. The town is the first to pass a by-law making it pesticide-free. A municipal by-law regulating the use of pesticides in the Town of Shediac has taken effect January 2003, which makes it illegal to apply pesticides and insecticides on private and commercial green spaces. There are of course specific prohibitions, exceptions, and rules of application that will be briefly outlined in the article.

The by-law prohibits pesticide application on any property owned by the municipality. As well as within 50 meters of a school, licensed day care center, park, playground, licensed senior citizen residence, university, church or hospital.

Exceptions to the pesticide by-law where pesticide application would be permitted are inside a building and in cases to control or destroy an animal, pest, plant or infestation which constitutes a danger to human health. Pesticide application will also be permitted on property used for farming or horticultural or in a greenhouse, with the condition that the applicator must inform the municipality each year of pesticides that will be stored or used on the property. Par-three golf courses have been given a five year grace period under the pesticide by-law to phase to alternate, safer methods of controlling weeds and pests.

According to the outlined exceptions in the by-law, when a pesticide application must be carried out the use of the pesticide must be by a licensed applicator only and to be applied in accordance with the manufacture's written instructions on the product label. A sign bearing a skull and cross-bones must be erected on the effected property 24hours prior to and up until four days after the pesticide application.

This pesticide by-law is enforceable through inspections and penalties. Fines range from 100\$ to 500\$.

The complete pesticide by-law can be viewed at:
<http://pestinfo.ca/documents/Shediac-Bylaw.pdf>



TOXICITY OF COPPER BASED ANTIFOULING COATINGS TO MARINE AMPHIPODS

Several environmental surveys in Canada and Europe have determined that the concentration of copper in the sediments around salmon aquaculture sites can be elevated above background concentrations. Concerns about the concentrations and toxicity of copper in the sediments led Environment Canada to conduct a study on the toxicity of sediments under salmon farm sites and in local harbours.

Copper concentrations in these sediments often exceed the CCME Interim Sediment Quality Guideline (ISQG) for copper (18.7

ug/g) and occasionally exceed the probable effects level (PEL) (108 ug/g) for marine sediments. The most probable source of the copper is the copper-based protective coatings that are applied to the nets used in salmon pen construction. These coatings are intended to eliminate or reduce the fouling of the nets by marine invertebrates and algae.

For this study, sediment toxicity tests with the marine amphipod, *Eohaustorius estuarius* were conducted on sediment samples collected directly under salmon net pens and on sediment samples from St. Andrew's Harbour and Black Bay Harbour. In addition, samples of clean sediment were spiked with two types of copper-based anti-fouling coatings to concentrations that were equal to the ISQG, equal to the PEL, and concentrations that exceeded the PEL levels by 5 fold. These spiked sediments were also then tested to determine the survival of the amphipods over 10 days of exposure. Spiking the reference area sediment with the two products at up to five times the Probable Effects Level of copper did not decrease amphipod survival in the 10-day tests.

Copper oxide, the active ingredient in the products tested, is insoluble in water and therefore is not likely released from the sediment matrix and bioavailable to the test organisms. The results of this study were presented at the Annual Aquatic Toxicity Workshop in October 2002 and an Environment Canada Surveillance Report is being drafted.

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METAL LEVELS IN SEDIMENT UNDER SALMON PENS IN THE BAY OF FUNDY, NB

Environment Canada has conducted a series of studies from 1998 to 2001 of salmon farms in the Bay of Fundy to address the concerns of possible chemical residues in the sediments under the salmon net pens. An Environment Canada Surveillance Report (**EPS-5-AR-02-01**) has been completed for the study series.

In 1998, the results provided indication that copper, zinc and cadmium were elevated at some salmon farm sites. In 1999, sediment samples were collected at 10 salmon farms sites. The results clearly indicated a consistent pattern of elevated copper in sediments collected under salmon net pens. The results also indicated that cadmium was not elevated. Unfortunately, no results for zinc were obtained due to analytical problems.

In 2000 and 2001, 8 locations on one farm site were sampled and the sediments were analyzed for metal concentrations. A similar pattern of elevated copper was again observed. As well, there was continued evidence that zinc was elevated above background concentrations in the sediments collected directly under the farm sites.

Although the sources of these elevated metal concentrations are not fully understood, there is some evidence to indicate that the use of copper-based antifouling coatings on the net pens could release copper. Some salmon food formulations can contain zinc and /or copper which are added as essential minerals in the fish's diet.

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GOVERNMENT & INDUSTRY TO ASSESS CLEAN COAL BURNING TECHNOLOGIES

The Government of Canada is partnering with electric power generators and

producers to investigate the feasibility of building a plant that will eliminate virtually all airborne pollutants and carbon dioxide from the coal-burning process.

The Government of Canada, through Natural Resources Canada, is investing \$1.66 million in the initial stages of the project. The project is led by the Canadian Clean Power Coalition (CCPC), a coalition of companies that account for more than 90 percent of Canada's capacity for coal-fired electricity generation. The CCPC and other partners, including the governments of Alberta and Saskatchewan, are contributing to the approximately \$5-million cost of this phase, scheduled for completion by the end of this year.

The first phase of the project consists of studies to determine which of three technologies is most cost-effective in capturing carbon dioxide (CO₂) and removing other pollutants. The options include oxyfuel combustion; chemically stripping the pollutants from flue gases; and gasification technologies that can convert coal into cleaner fuel forms. The CCPC plans to retrofit an existing coal-burning power plant by 2007 to produce at least 50 percent fewer CO₂ emissions. The full-scale demonstration facility will be used to test the technical, environmental and economic viability of new clean coal-burning technology. By 2010, the coalition hopes to develop a new plant, capable of reducing emissions by up to 90 percent, that will serve as a prototype for future plant construction.

Coal plays a vital role in Canada's energy mix, accounting for about 20 to 25 percent of our total electrical supply. This project is also of considerable interest internationally, because coal is a major source of electricity in the United States, India, China and east European countries. The Canadian companies involved in the CCPC are ATCO Power, EPCOR, Luscar Ltd., Nova Scotia Power Inc., Ontario Power Generation, SaskPower and TransAlta Corporation. Other partners include the governments of Alberta and Saskatchewan, the Electric Power Research Institute in the United States, and the International Energy Agency's Greenhouse Gas R&D Programme and Clean Coal Centre.

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MERCURY IN THE MARINE ENVIRONMENT AT PCI CHEMICALS, DALHOUSIE, NB

A *Lichen as Biomonitors for Mercury Emissions* study in 1999 (see TCU August 2001) determined PCI Pioneer Chemicals, the only operating chlor-alkali plant in Canada, to be a significant point source of mercury in the area of Dalhousie, New Brunswick and recommended further studies in the area. In October 2001, Environment Canada conducted a study to assess the impact of mercury in the aquatic environment of the Restigouche River by assessing mercury concentrations in marine sediment and blue mussels (*Mytilus edulis*) near the plant.

The results of the study revealed that the area of the Restigouche River around the PCI plant was contaminated with mercury. Results from sediment, water and mussel sample analysis all showed elevated mercury concentrations near PCI. Mercury concentrations in sediment were high close to the PCI plant (1.96mg/kg to 0.26mg/kg) and decreased with distance (background concentration of 0.07mg/kg).

The results of sediment sampling showed a contamination area, where mercury concentrations were higher than the background concentration, approximately 1km west, north and east of the PCI plant. Water analysis revealed drainage and effluents from PCI contained high mercury concentrations which ranged from 0.84ug/L to 4.32ug/L. Mussel samples collected within 100m of PCI had total mercury concentrations of 1.35 and 1.4mg/kg, which were greatly above the Canadian Environmental Quality Guideline of 0.033mg/kg for the protection of aquatic life. Concentrations between 4 and 12km away were significantly lower, either 0.02mg/kg or 0.03mg/kg. A biomarker study of mussels taken around the Dalhousie area indicated that there were physiological differences in the mussels, especially those located within 100m of the plant and 12km southeast of the plant.

The study results show mussels from the area near the plant as well as mussels 12km southeast of the plant, were smaller, showed evidence of endocrine disruption, had sequestered heavy



metals, and had enzyme changes in their digestive glands.

Recommendations from the report include future studies to better define the mercury contamination zone and to investigate the area of Charlo, 12 km away from PCI, where the mercury levels in sediment and mussel tissue were low but the physiological effects as seen in the biomarker results were similar to the sites located within 100 meters of the plant.

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USE OF SLIMICIDE CHEMICALS AT WOOD PULPING FACILITIES

A Surveillance Report pertaining to the use of slimicides at pulp mills in Atlantic Canada was recently released by the Air and Toxics Issues Section, Environmental Protection Branch (**EPS-5-AR-02-03**). Slimicides are used in the pulp industry to control algae and other microorganism and macroorganism growth at various stages of the pulping process.

The objective of the study was to compile and summarize data from three surveys conducted by Environment Canada in 1986, 1997 and 2000 in order to identify temporal changes in the quantities, identities and use patterns of slimicides in the pulp sector in the Atlantic Region. A review of the 1997 and 2000 data indicated that although the number of mills using slimicides decreased (from 12 in 1997 to 11 in 2000), the total volume of slimicides used almost doubled, with New Brunswick facilities accounting for approximately 71% of the total increase. In addition, the types of slimicides used changed markedly. None of the slimicides registered for use under the Pest Control Products Act and used in 1986 were used in 2000.

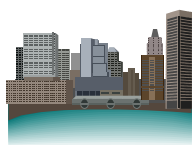
In 2000, five active ingredients (a.i.) of slimicides were identified in use in Atlantic Canada in volumes greater than 10,000 kg/year; sodium hypochlorite, potassium dimethyldithiocarbamate, sodium bromide, 2-(thiocyanomethylthio) benzothiazole (TCMTB), and methylene bis(thiocyanate) (MBT). The toxicity of each of these substances to aquatic organisms was evaluated using published information, with TCMTB and MBT having the highest toxicity to *Daphnia magna*

and/or Rainbow trout (*Oncorhynchus mykiss*).

There is currently no requirement for monitoring effluents specifically for the presence of slimicides, and as a result, there is very little information regarding typical concentrations in waste streams. There are, however, requirements for testing mill effluent for acute and chronic toxicity to aquatic organisms and some of those tests indicate toxic effluents, however, the contribution of slimicides to that toxicity is currently unknown.

Due to the lack of information regarding the presence of slimicides and their degradation compounds in effluent and receiving environments, this Surveillance Report recommended that slimicides and their degradation products be monitored in effluent from pulp mills using slimicides, particularly those facilities that have failed any of the required acute and/or chronic aquatic toxicity tests.

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BUTYLTIN CONTAMINATION IN ATLANTIC HARBOURS AND MARINAS

A monitoring program was conducted by Environment Canada in 2001/2002 to assess the status of butyltin contamination and corresponding environmental risks before a January 1, 2003 ban on the use of tributyltin (TBT) in antifouling paints takes effect. Sediment and blue mussel (*Mytilus edulis*) samples were collected from St. John's Harbour, NF, Halifax Harbour, NS, and two marinas on the south shore of Nova Scotia.

Tributyltin concentrations in Halifax Harbour ranged from 42 to over 46,000 ng of tin (Sn) per gram of sediment, with concentrations being highest at ship repair yards and vessel docks. St. John's Harbour TBT concentrations were mostly lower than in Halifax (<1.0 to 866ng Sn/g). Compared with samples collected in 1988 and 1994, TBT concentrations in the harbours were higher in 50% of the samples. For both harbours, sediment TBT concentrations as a percentage of total butyltins suggest a continuing fresh input of TBT into the marine environment.

Concentrations of TBT at the two marinas

were generally lower in the harbours (43-212ng Sn/g), but were greater than concentrations found at the same sites in 1988 and 1994. They were in the same range as TBT concentrations found at marinas elsewhere in Canada and in other countries.

Mussel TBT concentrations were low in both Halifax Harbour (1.6-3.6ng Sn/g) and St. John's Harbour (1.4-4.8ng Sn/g) compared with results from other years and locations. However, considering the sediment TBT concentrations, the risk to benthic organisms, particularly those in the large vessel harbours, remains high.

In addition other heavy metals concentrations were analyzed in sediment and mussels. Most sediment concentrations were higher than at the reference site. Many samples exceeded the Canadian Environmental Quality Guideline for marine sediment for metals such as As, Cd, Cu, Pb and Zn. Concentrations of most metals in sediment and mussels were similar to those found in previous years and other locations.

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VOC STANDARDS AND GUIDELINES FOR THE COATING INDUSTRY

The Canadian Council of Ministers of the Environment (CCME) has released two new publications setting out standards and guidelines for emissions of volatile organic compounds (VOCs) in the auto industry and the industrial maintenance coatings industry. These standards and guidelines have been developed as part of the CCME's NOx/VOCs Management Plan for reducing the formation of ground level ozone.

Recommended CCME Standards and Guidelines for the Reduction of VOC Emissions from Canadian Automotive Parts Coatings Operations describes recommended CCME standards, guidelines and codes of good practice for the coating operations of both new and existing automotive parts manufacturing facilities in Canada. The document outlines two distinct options automotive parts coating operations in Canada can use to achieve the desired VOC emissions reductions from this sector.

The first option is based on product and operations standards which incorporate



recommendations for product VOC content and good work practices. The second option is based on performance standards which are established as a maximum value expressed as a ratio of grams of VOC emitted per square meter of component surface area.

The second document, *Recommendations for CCME Standards and Guidelines for the Reduction of VOC Emissions from Canadian Industrial Maintenance Coatings*, incorporates separate standards and guidelines for the traffic and non-traffic sub-sectors of the industrial maintenance coatings (IMC) industry. The main focus of these standards and guidelines is product VOC content limits and operating practices to minimize VOC emissions.

The recommended standards and guidelines apply to product intended for use in the field on stationary equipment and for restoring protection from environmental exposure. IMC sub-sectors which will find these standards and guidelines of interest include: structural steel, bridges, refineries and storage tanks; drilling rigs; chemical process plants; pulp and paper plants; and road marking (traffic) paints. The recommended traffic sector standards and guidelines apply to zone markings as well as traffic markings.

(From Eco•Log Week/Dec. 9-16, 2002)

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LEGISLATION UPDATE



CANADA PHASES OUT CFC INHALERS

Amendments to the *Ozone-depleting Substances Regulations, 1998* were published on March 13, 2002. These amendments canceled the "essential use exemption" of CFCs in health care products and established a phase-out schedule for the commonly used CFC asthma inhalers. The widely prescribed Salbutamol CFC-inhalers will no longer be sold in Canada beginning

January 1, 2003. Complete phase out of all CFC-inhalers in Canada will be achieved by 2005.

Over 2.7 million Canadians suffer from asthma or chronic obstructive pulmonary disease, making these diseases among the most frequent health problems in Canada. Inhaled medications are the mainstay treatment for these conditions. The most commonly-used inhalers use a gas called chlorofluorocarbon (CFC) to propel the medication. While CFCs cause no direct harm to inhaler users, they are one of the major causes of the depletion of the ozone layer. In 1996 Canadian purchased 10.7 million inhalers, accounting for 214 tonnes of CFCs.

To protect the ozone layer, new CFC-free metered-dose inhalers (MDIs) have been developed that are as safe and efficient as the ones they are replacing. These new MDI inhalers replace the standard CFC propellant with an alternate substance called hydrofluoroalkane (HFA), which does not cause ozone depletion. Dry powder inhalers have never contained CFCs and so continue to be an ozone-friendly alternative.

For further information visit Environment Canada's website at:
www.ec.gc.ca/ozone/mdi



CEPA ENVIRONMENTAL EMERGENCY REGS AND MANDATORY RESPONSE

Federal *Environmental Emergency (E2) Regulations*, and CEPA 1999 emergency reporting and response provisions will likely be finalized in 2003. The regulations aim at enhancing the protection of the environment and human health in environmental emergency situations by promoting prevention and ensuring preparedness, response and recovery. They will include a list of 174 substances (published in August in *Canada Gazette Part 1*) such as chlorine and ammonia, which are used by many municipalities. The regulations will require establishment, implementation and testing of environmental emergency plans, and compliance notices will have to be filed with Environment Canada. Spills of these substances will trigger mandatory emergency reporting and response obligations under CEPA 1999, section 201.

Environment Canada's Environmental Emergency Website is: www.ec.gc.ca/ee-we/plans_e.cfm



TOUGHER VEHICLE AND ENGINE EMISSION STANDARDS

Following extensive consultations, the *On-Road Vehicle and Engine Emission Regulations* were published in the *Canada Gazette, Part II* on January 1. These regulations introduce more stringent emission standards for 2004 and later model vehicles and engines, effective January 1, 2004. These new stringent regulations reduce the level of smog-forming emissions from new on-road vehicles by up to 95% relative to current limits. This measure will result in progressively reduced annual emissions of pollutants that form smog as these cleaner vehicles are introduced into the Canadian fleet.

It is estimated that in 2020, the regulations will contribute to the following emission reductions from the fleet of on-road vehicles operated in Canada: nitrogen oxides (-73%), particulate matter (-64%), carbon monoxide (-23%) and volatile organic compounds (-14%). This measure will also result in decreased emissions of several pollutants, which have been declared "toxic" under CEPA 1999, such as benzene and acetaldehyde.

The *On-Road Vehicle and Engine Emission Regulations* complement previously announced regulatory initiatives to significantly reduce the sulphur content in both gasoline and diesel fuel which are also part of the government's clean air agenda.

Measures in the Government's Climate Change Plan for Canada include working with auto manufacturers to achieve a 25 percent improvement in new vehicle fuel efficiency by 2010, increased ethanol blending in 25 percent of the gasoline supply and refueling technologies and infrastructure for commercialization of fuel cell vehicles.

For further information please visit



http://www.ec.gc.ca/Press/2003/030102_n_e.htm



TETRACHLOROETHYLENE REGULATIONS

On March 12th, 2003, the *Tetrachloroethylene (Use in Dry Cleaning and Reporting) Regulations* will be published in the Canada Gazette, Part II. The regulations stipulate the restrictions on use, containment and disposal of tetrachloroethylene in the dry cleaning industry. The implementation dates are staggered with all requirements to be in effect by January 1st, 2004. The calendar year 2004 is the first reporting year on the use, disposal and recycling of tetrachloroethylene. The regulations can be viewed at the following website: www.ec.gc.ca/CEPARRegistry

The *Solvent Degreasing Regulations* were published in the Canada Gazette, Part I on December 7th, 2002 for a 60-day public comment period. The purpose of the Regulations is to reduce releases of trichloroethylene (TCE) and tetrachloroethylene (PERC) into the environment from solvent degreasing facilities using more than 1 000 kilograms of TCE and PERC per year. These proposed Regulations include a market intervention by establishing tradable allowances for the use of TCE and PERC in solvent degreasing operations that exceed the 1 000 kilograms threshold per year. These allowances will be reduced by 65% in 2007 and every year thereafter. It is expected that the regulations will be published in Canada Gazette, Part II in 2003. Further information is available at the following website: www.ec.gc.ca/nopp/degrease

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PROPOSED FEDERAL PETROLEUM PRODUCTS STORAGE TANK REGULATIONS*

Environment Canada proposes to repeal and replace the existing *Federal Registration of Storage Tank Systems for Petroleum Products and Allied Petroleum Products on Federal Lands and Aboriginal Lands Regulations*. The proposed regulations, to be made under the *Canadian Environmental Protection Act, 1999* (CEPA) would have a broader scope

of application and would provide a more comprehensive framework to effectively prevent pollution from federal storage tank systems.

The objective of the proposed regulations is to eliminate releases into the environment from petroleum products and allied petroleum products storage tank systems. Central to the proposed regulations is a requirement for mandatory compliance with the technical requirements before registration and use of tanks. These technical requirements will be clearly identified in the regulations and derived from the updated Canadian Council of Ministers of the Environment (CCME) Code. The operation of a leaking tank will also be prohibited in the proposed regulations.

The existing regulations apply to federal lands and federal works and undertakings under the authority of the Ministers of the Crown who concurred in the making of those regulations. The application of the proposed regulations is broader and will apply to federal departments, boards and agencies, and Crown corporations, whether on federal land or elsewhere. In addition they will apply to federal lands and aboriginal lands, and certain categories of federal works and undertakings.

It is expected that the draft regulations will be published in Canada Gazette Part I in the winter of 2003.

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INTERPROVINCIAL MOVEMENT OF HAZARDOUS WASTE REGULATIONS*

The *Interprovincial Movement of Hazardous Waste Regulations* were published in Gazette II on August 15, 2002 and are now law. The regulations ensure that the manifest, tracking and classification system under the current *Transportation of Dangerous Goods Regulations* (TDGR) are maintained in force during transition of hazardous waste provisions from the *Transportation of Dangerous Goods Act* to CEPA, 1999.

The comprehensive Interprovincial Movement of Hazardous Waste Regulations under CEPA are expected to be published in Gazette 1 during the

summer of 2003 and in Gazette 2 before the end of 2003.

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REGULATIONS CONCERNING THE EXPORT AND IMPORT OF WASTES CONTAINING PCB (REIWPCB)

The Regulations concerning the *Export and Import of Waste containing PCB* are expected to be published in the Gazette I in March 2003 and in the Gazette II in June 2003.

The main purpose of this regulatory initiative is to strengthen the current regulatory controls on the imports of PCB wastes. The regulations will ensure consistency between the controls for imports and exports by including a specific ban on landfilling or import for operations other than destruction and more stringent transformer decontamination standards. There is a limited number of facilities throughout the world capable of disposing of various types of PCB wastes. By assisting developing countries lacking the capacity to properly manage their PCB wastes, Canada will be helping to ensure that PCBs are not released into the environment.

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OFFICE OF ENFORCEMENT



REMOVAL OF SUNKEN VESSEL "FOREST GLEN"

On November 17, 2002, the 30-meter fishing vessel "Forest Glen" sunk at the Harbour Authority wharf in Digby, Nova Scotia. At the time of the sinking, the vessel fuel tanks contained a significant volume of diesel oil as well as a number of other contaminants such as lubricating oils, halons, and hydraulic oil. A large oil slick was observed on the surface of the water following the sinking. The owner proved unable and/or unwilling to take action so the Canadian Coast Guard (CCG), with the support of EC and other agencies, deployed a oil spill boom around the sunken vessel and contracted divers to pump off as much of the diesel oil (approximately 2000 liters) as possible. However, ongoing oil leaks represented a significant threat to local wildlife, clam beds, aquaculture, commercial fishing activities and, as a precaution, EC, in partnership with the Canadian Food Inspection Agency, arranged for a closure of shellfish harvesting in the area.

Based on this threat to the environment, it was decided that the vessel should be removed. On January 8, the vessel was lifted and taken to an approved beach for cleaning, demolition and disposal at an approved landfill. EC Enforcement staff are reviewing this case to determine if charges under the Fisheries Act are warranted.

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