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Mercury product management in Canada

Mercury

Perhaps Lewis Carroll was referring to the twinkle of mercury used for hat production in the 1800s, which led to the Hatter's ultimate madness. Mercury use dates back to 4,500 BC when Egyptians and Chinese used it as a pigment to paint their tombs and preserve their dead. Since then humans have used this unique form of liquid metal for a variety of applications, including warding off evil spirits, healing, processing precious metals, and more recently, conducting electricity.

The toxic effects of mercury also date back to its early applications when workers in mercury mines were almost guaranteed death or insanity. More recent cases of direct mercury poisoning have occurred

toxins about which we know much less, a regulatory stalemate on mercury is bad news for the protection of the brains of future generations”.

Mercury in Canada's municipal waste

For the last decade, monitoring mercury releases to air and land has focused on large generators in the mining, electricity and pulp and paper sectors. For the most part, significant (~50 per cent) reductions in mercury emissions in this country can be attributed to upgrades to modern industrial processing technology. Today, these three sectors account for about 7.1 tonnes of mercury emissions and disposal. Under the *Canadian Environmental Protection Act* (CEPA) industry is required to

report onsite and transferred mercury waste each year. But the tracking system — the National Pollutant Release Inventory (NPRI) — does not track mercury in products. This is a serious problem because under CEPA, Canada's strategy for preventing mercury pollution is through so-called life-cycle management. Yet because of poor consumer education, no product labelling, and an immature household hazardous waste collection infrastructure, most mercury products end up in

the municipal waste stream destined for landfills or incinerators. There is no lifecycle management infrastructure nor is there enough information to make informed decisions.

Recent analysis confirms that municipal solid waste may indeed be the greatest source of mercury pollution in Canada today (op.cit.).

Thousands of grams of mercury are put into consumer products sold in Canada every year. These include fluorescent lamps, thermostats, automobiles, appliances, electrical switches and gauges, thermometers, hospital equipment, dental amalgam, contact-lens solution, and even nasal spray. While cost-effective alternatives to mercury use in these products do exist (except for fluorescent lamps), there are no restric-

“It began with the tea, ... and most things twinkled after that.”

The Mad Hatter, Alice in Wonderland

in Minamata, Japan (1956), Iraq (1971), and northwestern Ontario (1969). The first two incidents led to thousands of deaths and highly elevated mercury levels in survivors.

High-level mercury exposure can lead to birth defects, brain, kidney or liver damage, and central nervous system disorders. More recently, medical researchers have concluded that chronic exposure to low-levels of mercury by children and fetuses increases the risk of neurological damage, behavioral problems and learning disabilities. So serious are the toxicological effects of mercury exposure that a leading medical researcher, Dr. Philippe Grandjean, commented on governments inaction on mercury, warning, “Given the existence of many other neuro-



Madness

tions in Canada on putting mercury into consumer products (outside of children's toys). U.S. consumption data tells us that about 70 per cent less mercury is used in products today than ten years ago. This may explain Canada's laissez-faire attitude toward mercury policy. The trouble is that many of the products sold ten years ago are still in use, or are being stored, and will be disposed over the next decade.

In their recent study, *Canadian Mercury Inventories: The Missing Pieces*, authors L. Hagreen and B. Lourie attempt to quantify the amount of mercury contained in products in Canada, and calculate the annual release to air and land from disposal. The results show about 327 tonnes of mercury in products in Canada, from which approximately 20 tonnes are released into the environment through sewage, landfill and incinerators every year. These findings demand immediate action. A single gram of mercury can contaminate a 20-acre lake.

The role of product stewardship

A decade of federal policy paralysis on mercury in products compels us to look to other organizations and other levels of government for solutions. The last five years has seen significant movement on provincial stewardship initiatives for end-of-life product management. Every province has

the necessary legislative framework to require a program which, if designed wisely, can be effective in tackling the problem of mercury in products.

The program elements needed are as follows: phase out mercury in products; require manufacturers or brand owners to disclose (via labeling) that their products contain mercury; and, oblige manufacturers or brand owners to establish and finance consumer education, product take-back facilities and end-of-life management.

Provincial governments can designate programs specifically dedicated to one product or a group of products. For example, Ontario's new *Waste Diversion Act* enables the environment minister to regulate stewardship programs for a specific product, or group of products. When the Act was promulgated in 2002, the ministry indicated that it intends to designate electronics equipment (which can include electrical switches, appliances, relays and thermostats), fluorescent lamps, automobiles and batteries.

Provincial governments also have legislative authority to set targets, require a minimum collection infrastructure, set parameters for end-of-life management guidelines, identify minimum education and awareness activities as well as product phase-outs and bans and/or product procurement requirements.

“Recent analysis confirms that municipal solid waste may indeed be the greatest source of mercury pollution in Canada today.”

End the madness!

When we consider the toxic effects of mercury and that product alternatives exist for nearly every application today, we must ask our leaders, "where is the policy to protect the public?" While a number of voluntary guidelines have been established under the Canada-wide standards process, these are primarily focused on

end of life emissions and do not address pollution prevention and product use. CEPA provides the Federal government with the means to address mercury use and pollution, however after years of indecision and inaction under CEPA, provincial product stewardship maybe the answer. Comprehensive, consultative

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Switch-Out

Most North American vehicles on the road today contain mercury switches located in anti-lock breaks and convenience lighting. Japanese and Swedish manufacturers stopped using mercury nearly a decade ago and mercury switches in North American vehicles were discontinued this year.

Each switch contains about 0.8 grams of mercury, which is present in 16.5 million cars in Canada. In an effort to address the release of the associated 13.2 tonnes of mercury from smelting old cars, Toronto-based Pollution Probe launched "Switch Out" in 2000. The program sets out operating guidelines and instructs automotive recyclers how to remove the switches. Switch Out also coordinates and finances transportation of the switches to a recycling facility. Since inception the program has seen increased numbers of recyclers participating and switches collected. Today there are over 100 Switch Out auto recycling participants operating in Alberta and Ontario. Still, the program collects less than 5 per cent of the switches passing through vehicle recycling facilities each year.

Last November, in a one-month pilot, Switch Out offered automotive recyclers a financial incentive of one dollar per switch. While volumes increased during the pilot, recyclers suggest mandating switch collection is the most effective way to achieve maximum collection results.

"We're committed to working with government and industry to get these switches out," says Trevor Pettit, Executive Director of the Ontario Automotive Recyclers Association, **"but voluntary efforts only last so long. The province has a regulatory role and industry (steel smelters and/or car manufacturers) must pay for the service."**

Piecemeal government and industry funding is not the answer. Accessing appropriate and ongoing funding from the automobile manufacturers, as well as regulating standards on mercury emissions for the steel sector, are needed if these programs are to be effective.

For more information: www.switchout.ca

Managing end-of-life mercury

If one considers financing, collection and diversion as the holy trinity when designing a successful stewardship program, lack of attention to end-of-life management may render a program not only useless, but more damaging to the environment and the public.

Mercury-containing products should be handled with great care. Processors receiving material must take the time to isolate the product, remove the mercury and send it to the appropriate recycling facility. Recent events in North America highlight that without proper guidelines and moni-

toring in place, loads of material commingled with mercury products may find their way to makeshift smelting and metal recovery initiatives in the developing world. In addition, legitimate recyclers will find themselves unable to compete against these low-cost markets, which could undermine their industry.

Cindy Thomas, plant manager for Noranda's new Brampton recycling facility says, **"The risk of a stewardship program not setting environmentally sound management (ESM) guidelines or vendor qualifications is that the only criteria for selecting recycling service providers will be cost."**


"Many low cost electronics recyclers do not want to invest in the labour to remove mercury-containing bulbs from scanners or photocopiers prior to processing. As a result, the mercury in the bulb may be released to the environment when it is either shredded or land-filled."

Fluorescent Lamp Recyclers (FLR) has facilities in Montreal and Cambridge. Its technology separates and recycles the glass, mercury, phosphor, aluminum and brass components of the tubes. Mercury is then sent to reprocessing facilities in the U.S. where it's used in new products where take-back programs exist.

Unfortunately, mercury re-use in products is not the ideal solution, considering that these take-back schemes are rarely effective, and that its use should really be prohibited. However, without any federal-operated or mandated mercury storage sites, options are limited.

"This is no long-term solution, but at least it reduces the need for mining of virgin mercury," says Tom Maxwell, president of FLR.

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provincial product stewardship, combined with product phase-outs and consumer education, can offer the long-awaited relief to this mercury madness. 

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