



# <toxic substances

CARELESS MANAGEMENT AND DISPOSAL  
OF TOXICS CAN HAVE CATASTROPHIC  
AND **ONGOING IMPACTS**



107  
< TOXIC  
SUBSTANCES



## Toxic substances in New Zealand

New Zealand is a young country. It doesn't suffer from the long history of pollution associated with older, more industrialised countries. Our economy has been based on our natural resources, largely agricultural. Historically, some of the common ways New Zealanders have used and been exposed to toxic substances has been through agriculture, horticulture and timber treatment.

Like the rest of the world, we went through an era when toxic substances were used all over the place to kill some things, preserve others or make others grow bigger, faster and better – weed killers on farms, antisapstains at timber mills, in animal dips, and everywhere fertilisers. And we have benefited; using such chemicals has resulted in enormous increases in productivity.

At an individual level, too, our modern lives now depend on chemicals. We simply wouldn't be able to live as we are used to, and want to, without them – they are essential to industry, agriculture and modern life.

Chemicals are toxic if they are present in concentrations or levels that cause harm (damage, disease or death) to people or the environment. What we need to do is make sure that the risks to our health and environment are acceptable and well managed.

Substances can also be hazardous if the way they behave presents a risk to us, the environment or both. For example, fireworks can explode, petrol can catch fire, pure oxygen can accelerate fires and battery acid corrodes.

The trick with toxic chemicals and hazardous substances seems to be to balance the benefits against the risks, and to make sure there are controls that help us use them safely.



## Managing toxics

New Zealanders seem very aware of the dangers of chemicals and hazardous substances. Disasters in industrialised countries, as well as here in New Zealand, have triggered this awareness. Three thousand people were killed in Bhopal in India in 1984 when methyl isocyanate gas was accidentally released from a factory. In 1986 radioactive material spread over much of Europe after the accident at the nuclear power plant at Chernobyl. 200,000 people had to be resettled and there will be many thousands of people who ultimately die from illnesses associated with the accident. In 1984 we had a serious chemical fire at the ICI warehouse in Mount Wellington, Auckland.


These accidents and the dangers they highlighted led to significant law changes internationally and here in New Zealand. The ICI fire led to an investigation of how we control and manage pollution and hazardous substances. It concluded that our rules and regulations were not good enough with many gaps, overlaps and areas of poor performance, and that changes to our laws were needed.

The result of the investigation was New Zealand's Hazardous Substances and New Organisms Act (HSNO), which came into force in 1996. The Act requires the safe use and disposal of hazardous substances.

New Zealand signed up to the Stockholm Convention in December 2004. This United Nations treaty bans the making, use or importation of 12 particularly harmful and persistent chemicals. The banned toxins include older pesticides, such as DDT and dieldrin, which we used in sheep dips and timber treatment plants. The others are:

- < PCBs (polychlorinated biphenyls)
- < Seven other pesticides – aldrin, chlordane, endrin, heptachlor, mirex, hexachlorobenzene and toxaphene
- < Dioxins and furans (polychlorinated dibenzo-p-dioxins or PCDDs, and polychlorinated dibenzofurans or PCDFs).





## So what are we doing about toxic chemicals in New Zealand?

In 1995, we began to reduce discharges from industry of dioxin.

Some toxics are accidentally produced through burning. Until a few years ago, the main source of dioxin in our atmosphere was from fires at landfills. Now we have banned those fires.

In industrial countries, metal works are an important source of dioxins in the air. Eighty two industrial sites have been studied in New Zealand. Apart from two sites, the emissions were well below what is considered acceptable. Generally, emissions from New Zealand metal industries are low.

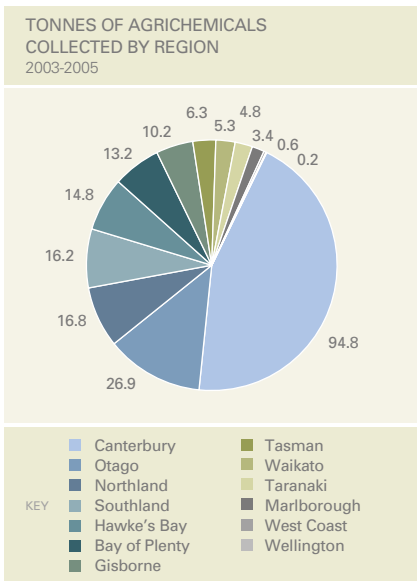
Last year New Zealand banned activities that used to generate dioxins. We have banned bitumen burning on roads and burning of tyres, oil and plastic-covered copper wire in the open. School and hospital incinerators are on their way out. We still need to find a way to dispose of plastic wrap from farm silage without burning it.

## Measuring dioxins and PCBs

One of the easiest ways to measure poisonous material in the air is to test the breast milk of women feeding babies.

A study by the Ministry of Health, over 10 years from 1988, did just that. It looked at how much organochlorine was present in New Zealand women's breast milk. The study showed that between 1988 and 1998, the amount of the toxic chemical in mothers' milk reduced considerably – by about 70 percent. The Ministry of Health concluded that the things we have done to reduce these poisons in our environment have been successful and all of us are now less exposed to nasty chemicals.

In 1995, we began to research the level of organochlorines in our bodies, our food and in the environment. The findings, released in 2001, show we have low levels of dioxins and other toxic chemicals in our bodies and in our environment, and the dioxin levels in our food are the lowest recorded in the world.



### Getting rid of old farm chemicals

Since 2003, the government has been working with councils to remove old, banned, forgotten and unwanted chemicals stored in people's sheds – the Agrichemicals Collection Scheme. By January 2006 about 220 tonnes had been collected. Ninety five tonnes of this came from Canterbury. A lot also came from Otago, Northland and Southland. Those we can't deal with ourselves are sent to France and Germany for environmentally safe disposal. The programme will run for another three years.



## We are what we eat

Using chemicals in food production is standard practice in New Zealand whether it is for cropping or the rearing of animals. Eating food that is free from harmful chemical residues is important for our health. The job of making sure controls on chemicals are in place so our food is safe lies with the New Zealand Food Safety Authority.

In 2004, the New Zealand Food Safety Authority released results from a survey of 120 foods you would find in an average Kiwi diet – things like fresh fruit and vegetables, and takeaway foods. They had been tested to see if they contained chemical residues and contaminants. More than 45,000 analyses showed we had nothing to worry about.

In 2005, the Authority tested unprocessed lettuce, pears, strawberries, potatoes, oranges, peanuts and taro for 217 agricultural compounds. In total, 191 residues were found in the 336 samples tested, but only three exceeded the allowable limits.



## Cleaning up old sites

Despite many clean-ups, we still have contaminated sites in New Zealand. They are the result of how we used land in the past, including to make and use pesticides, produce coal and gas, mining, rubbish disposal, timber treatment, and sheep dipping. Local government is leading the clean-up of these sites.

New Zealand's most contaminated site is at Mapua, the abandoned Fruitgrowers Chemical Company site near Nelson. It was heavily polluted with a range of long-lasting chemicals such as DDT, aldrin, lindane and dieldrin. It is nearly cleaned up as a result of a joint project between central and local government. The contaminated soil has been successfully treated on site using pioneering New Zealand technology developed by Environmental Decontamination Ltd. The molecules of the toxic substances are smashed into harmless pieces by small steel balls in a mill.

When the site has been cleaned up it will be available for use for a mixture of commercial, housing and public open space.

## What have we learnt?

We use chemicals as part of our modern way of life. Our economy depends on their continued use, and our lifestyles are made possible and supported by chemicals in numerous forms. Nothing is going to change this.

The challenge is to make the best use of the chemicals available to us while at the same time making sure we are producing them, using them and disposing of them in ways that don't harm human or environmental health. We have to be constantly aware of, and live with, an acceptable level of risk.

History has taught us that careless use and disposal of toxics can have catastrophic effects on air, water and land. We have laws now that control how toxic substances are managed. We are also committed to cleaning up all known high-risk contaminated sites in New Zealand – millions of dollars are being spent.

Using and disposing of toxic chemicals safely to prevent problems is a lot easier than trying to clean up the mess.

