



## **Letter to Australian Standards**

# **Pesticides and Weedicides, and their Impact on Children**

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2003

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Friday, February 28<sup>TH</sup>, 2003

Note: Some personal details have been omitted from this document.

Dear Standards Australia:

I wish to outline a substantial medical concern I have in relation to the application of termiticide (a synthetic pyrethroid: either Talstar or Biflex) in my Department of Housing (DOH) unit. The DOH has ultimately referred me to the Australian Standards for pesticide application, as it denies any responsibility in terms of the morbidity experienced by myself and my son in relation to my unit's treatment. With the DOH essentially denying any Duty of Care, I must therefore question the Standard.

I propose to offer you in this letter substantial (scientifically endorsed and documented) toxicological and other evidence supporting my duel claim that:

1. the termiticide and its carrier agents are wholly dangerous to human health, and
2. that the particular method of termiticide application used on my unit (drilling and pumping) is, as well, not safe.

These 2 major problems therefore ensure that the principle of Duty of Care is impossible to uphold. In other words, safety cannot be engineered into this type of termiticide treatment or procedure as it currently stands.

Please note the following points:

- ◆ My unit was treated for termites (drilling, injection and capping of boreholes in concrete against my unit's exterior wall, and termiticide injection into soil) on Dec. 7<sup>th</sup>, 2000. Contrary to the DOH's assertions, this was *not* performed at my request. I *only* wanted the fences treated, as they were the only structures infested and, according to the pest technician who first inspected my unit from top to bottom, the only likely site for infestation (he said my unit's hardwood structure was not suitable for the dietary habits of termites). Since the first day of termiticide treatment when I became nauseous, dizzy and intensely fatigued as the termiticide was being applied, I have been stricken – right through 2001 and to the present – with a cascade of extremely painful and debilitating symptoms particularly centering on my joints. These symptoms were diagnosed by a Penrith

doctor as polyarthralgia, and were confirmed by Manly Doctor of Environmental and Nutritional Medicine Dr. Mark Donohoe as pesticide poisoning. Only one oblique indication of a medical caution was offered to me before the initial spraying took place, and that was by the pest technician who conceded that he should not treat the soil next to my herb garden, in case of **toxic effects** on the plants. My child has also developed anomalous symptoms such as waking with stomach pains each morning during 2001. My joint pains have made it difficult, if not impossible on occasion, to brush my hair, do the dishes, go to the toilet and play with my son, due to severe joint pain (both wrists and shoulders, and right elbow). My neighbor (whose unit shares the concrete slab upon which my unit is situated) had also experienced – from February to June of 2001 – a distressing and anomalous cascade of viral respiratory complaints. She became *considerably* animated when I told her of my health problems and when my symptoms started after my unit was treated with pesticide.

- ◆ I have notified the Richmond Office of the DOH, as well as the Regional Office and the Director General of the DOH that, annually, for 4 years prior to being offered the unit, I stated in the DOH's Eligibility Review Surveys (which I have photocopies of) that I experienced chemical sensitive asthma and that this medical information on file was not considered when the DOH unilaterally decided to spray my entire unit. Neither were my protestations of acute reactivity to the spray given any credibility when a second pest technician came back a few weeks after the initial spraying, as I had hoped, to merely report on the continuing infestation in the fence line and recommend its removal and replacement (what I and my neighbor in Unit 14 had collectively been asking for more than a year because of its disintegrated state). I said to this technician that I got very sick with the first spraying and did not want to get sick again, but he said he had to be seen to be doing something by the DOH, so he sprayed the fence yet again. **And I got acutely sick yet again, and then became chronically ill with the joint pains.**
- ◆ Chemical applications – as far as I am aware – are not tracked by the DOH (nor are ongoing issues of most varieties effectively tracked by the Richmond Office in particular), leaving residents and contractors without suitable and appropriate health warnings. I have a Degree in Environmental Health (I graduated top of my Degree in 1998 at the University of Western Sydney, Hawkesbury) and am currently completing a PhD thesis in Sociology (which includes studies in toxicology), so I am not entirely ignorant in this matter.

- ◆ The DOH unit next to my ex-wife's previous DOH unit in South Windsor has been treated for an ongoing termite infestation **8 times** (drilling and capping), according to its current tenants, since they moved in about 2 years ago! It was also treated at least once before when the previous tenants (a lady and child) lived there. This lady alleged (to me) that the DOH ignored her requests to treat the infestation for **two years!** Meanwhile, the associated fungal situation in that unit made her and her daughter extremely ill. I did an environmental assessment on her unit (in a private capacity in 2000, when I was accredited as an Environmental Health Officer by the Australian Institute of Environmental Health, NSW Division) and determined that the infestation (termites and associated fungal mycelium, *and* the wood rot fungi that typically attract termites because of their appetizing interaction with wood) had caused her and her child's mycotoxic symptoms. No one in the DOH wants to address *this* issue, especially – I imagine – because the repeated treatments of this unit also exposed my ex-wife and my son in the unit immediately next door to toxic termiticide vapors (apparently also synthetic pyrethroids). The new tenant living in this blighted unit says that his kitchen floor has partially collapsed, putting his fridge off level, and causing it (the compressor) to blow up, costing him dearly. I crawled under this unit in 2000 in order to examine the huge termite nests and significant quantities of moisture under the flooring of one bedroom, and noted extensive termite activity throughout the sub-floor area. This tenant told me that the PestKil manager eventually treated an infested tree located nearby on Council property, in order to destroy the likely source of all the many infestations in that area (at least two streets of houses and units have been hit by termites in the last few years). This current tenant has given up trying to communicate with the Richmond Office of the DOH, due to this situation where problems are so inadequately handled (if they are addressed at all) that they repeat. I also attest to this ongoing state of affairs.

I now offer Standards Australia the results of my research in order to confirm my claim that termiticide application in units having concrete slabs (as well as, very likely, other kinds of residences) is subject to multiple pathways of exposure for the unit's inhabitants. This information (in full or part) has been forwarded to both the Regional Director and Director General of the DOH, the Ombudsman's Office in Sydney, and my local M.P. I now request Standards to comment on these findings and my conclusions.

## PART 1

### PESTICIDE RESEARCH: Quotes & Comments (full

sources/references provided) by Murray Thompson BAppSci EnvHth, Hons I SocEc (paraphrases are indicated in blue font)

Note: The pesticide used on my unit (according to what I recall the PestKil technician saying) was a **synthetic pyrethroid** called "Talstar"<sup>1</sup> or "Biflex" (with the *active*, but not the *only*, ingredient being called "Bifenthrin"). The pesticide used at my son's mother's unit was apparently also a synthetic pyrethroid. Details of the toxicity and other properties of the pyrethroids, plus some of the carrier and so-called 'inert' ingredients included in the pesticide mixes, are incorporated into this report.

### IMPORTANT CONSIDERATION: CHEMICAL DIFFUSION

#### *DIFFUSION THROUGH CONCRETE (discussion and quotes)*

Chemical diffusion is a term that potentially explains how pesticide would migrate from soil, through a concrete slab situated under a unit (which is very porous), and

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<sup>1</sup> Talstar details:

DPR Code: 2300

DPR Common Name: BIFENTHRIN

CAS Number(s): 82657-04-3

EPA PC Code(s): [128825](#)

Formula:  $C_{23}H_{22}ClF_3$

Activity: acaricides (pyrethroid ester acaricides); insecticides (pyrethroid ester insecticides)

Synonym(s):

- ALPHA, 3-ALPHA (Z)-(+/-)-(2-METHYL-1,1-BIPHENYL-3-YL)-METHYL-3-(2-CHLORO-3,3,3-TRIFLUORO-1-PROPENYL)-2,2-DIMETHYLCYCLOPROPANE CARBOXYLATE
- {1-ALPHA,3-ALPHA-(Z)}-(+/-)-(2-METHYL {1,1'-BIPHENYL}-3-YL) METHYL 3-(2-CHLORO-3,3,3-TRIFLUORO-1-PROPENYL)-2,2-DIMETHYL CYCLOPROPANE CARBOXYLATE
- BIPHENTHRIN
- FMC 54800
- CAPTURE
- BRIGADE
- TALSTAR ([http://www.cdpr.ca.gov/cgi-bin/mon/bycode.pl?p\\_chemcode=2300](http://www.cdpr.ca.gov/cgi-bin/mon/bycode.pl?p_chemcode=2300); <http://www.fs.fed.us/foresthealth/pesticide/bifenthr.html>).

into the living area. Please note the following quote. It refers to chemical diffusion in terms of the burial of chemical wastes in a clay-lined waste disposal pit:

The objective of controlling the hydraulic conductivity is clearly one of limiting advective contaminant transport (ie the movement of contaminants with moving water) through the liner. However, despite more than a decade of research and the existence of good supporting field data, it is only recently that it has been generally recognized that there is a second contaminant transport process which will occur even through a very low hydraulic conductivity clay liner: that process is chemical diffusion. ...diffusion may be the dominant contaminant transport mechanism in a well-constructed clay liner. Furthermore, contaminants can escape from a waste disposal site, by diffusion through a liner, even if water flow in the liner is into the landfill (Rowe 1994:219) (emphasis added).

Further:

In soil, bifenthrin is relatively immobile, particularly in soils with large amounts of organic matter, clay, or silt. Practically insoluble in water, bifenthrin has an insignificant potential to leach to ground water. Its soil half-life ranges from seven days to eight months, depending on the soil type and amount of air in the soil... Although bifenthrin exhibits low volatility, its Henry's Constant suggests that it may readily move to the vapor phase because of its insolubility in water. **SAFETY RECOMMENDATIONS** Product labels warn that bifenthrin is harmful if swallowed, inhaled, or absorbed through the skin. Further, the label cautions against breathing the dust, vapor, or spray mist (emphasis added) (Wales 1998:149).

The soil upon which my unit is situated is mostly clay. This means bifenthrin remains in the clay immediately next to the concrete slab where it was applied and then – theoretically – diffuses through that clay via the above-noted process of chemical diffusion, into the concrete slab and then into my unit by way of vaporization. There is also another pathway, proven more explicitly in terms of my argument via peer reviewed and substantiated research, through which chemicals may enter a home.

### *DIFFUSION THROUGH WATER PIPES (discussion and quotes)*

Numerous, though apparently not overwhelming, instances of chemical permeation of water pipes have been studied. Rather than indicating only a relatively small dilemma, I believe that the limited engagement of this particular problem by the literature is actually representative of a very pervasive situation. Note the following quotes taken from abstracts of Journal articles:

Sites of seven incidents of plastic pipe permeation were visited between July 1986 and December 1987, and samples of soil, pipe material, and pipe water were collected. In addition, a comprehensive literature review was undertaken to document other cases of permeation. This work demonstrated that the majority of permeation incidents were associated with gross soil contamination in the area surrounding the pipe. Soil contamination occurred mainly after pipe installation, suggesting that soil analysis prior to pipe installation will not significantly decrease the number of incidents. The occurrence of about half the incidents in low risk sites indicates that limiting plastic pipe use to these areas will not be effective in preventing permeation. Gasoline was the most common contaminant (five out of seven cases). In all cases, the successful remedial action was to replace the plastic pipe with copper pipe... (Holsen, Park, Jenkins & Selleck 1991).

A water quality complaint received by the city of Tallahassee Florida, resulted in an investigation that found contamination of a polybutylene service line caused by gasoline leaking into the soil surrounding the pipe... levels of 1,2-dibromoethane were found to be 50 times the limit set by the Florida Department of Environmental Regulations. The service line was replaced with copper pipe, which solved the problem (Leseman 1986).

Recent investigations have found that organic chemicals may contaminate drinking water by permeating buried plastic pipes and gasket materials... Many lipophilic compounds tested were found to permeate to a detectable level in consumers' tap water within a month at one third of their aqueous solubilities. It was also found that PB [polybutylene] was more permeable than low-density polyethylene to toluene and that chlorinated

hydrocarbons permeated PB faster than unchlorinated hydrocarbons. Gasoline compositions such as benzene, toluene, ethyl benzene, and xylenes appeared to be highly permeable to PB and gasket material (Park, Bontoux, Holsen, Jenkins & Selleck 1991).

Very high levels of contamination by aromatics and chlorinated solvents in drinking water after a period of stagnation of the water have been recorded, exceeding proposed new standards for benzene, trichloroethene, and tetrachloroethene. Incidents involving service pipes occurred more often than those involving mains supplies... Permeation through polyethylene has been reported for quite low levels of soil contamination. Many cases [of reported permeation events] took place in residential areas caused by leakage from cars or spillage of paint thinners onto soil directly surrounding the plastic pipe (<http://www.fwr.org/pipeline/dwi0772.htm> 1997).

Polybutylene pipes (0.75 in.) buried in both water-saturated and unsaturated soils contaminated with toluene, trichloroethylene, 1,2-dichlorobenzene, and o-chlorophenol were permeated to detectable levels in 1 to 150 days, depending on the organic chemical and its concentration (Holsen, Park, Bontoux, Jenkins & Selleck 1991).

**Please note that at least 3 of the classes of contaminants listed in the last two quotes above represent so-called 'inert' constituents or carriers of pyrethroid pesticide mixtures.** See farther on in this study under the heading "INERTS".

## PESTICIDES

### *TOXICITY -- GENERAL (quotes and paraphrases)*

Pesticides are the only class of toxic chemicals intentionally introduced into the environment to kill or damage living organisms. Yet, pesticides rarely stay where the applicator intends them. In fact, researchers at Cornell University estimate that over 99% of the pesticide applied does not reach the target pest and instead moves into ecosystems to contaminate the land, air, and water (NCAP 1997:1, citing Pimentel & Levitan 1988).

Convincing toxicological evidence now exists that a number of pesticides and industrial chemicals have disruptive effects on the endocrine system (see Colborn, Dumanoski, and Myers 1996; Colborn, vom Saal, and Soto 1993). The endocrine system is composed of glands and hormones that act as messengers in the body in order to regulate growth, development, behavior, and sexuality. When the body mistakes synthetic chemicals for natural hormones, it reacts to them in ways that can cause irreversible damage, especially when exposure occurs during the critical period of development before and immediately after birth (NCAP 1997:4).

Children exposed to a variety of pesticides in an agricultural community in Mexico show impaired stamina, coordination, memory, and capacity to represent familiar subjects in drawings (Schettler, Stein, Reich & Valenti 2000:3).

Other families of pesticides including **pyrethroids**, pyrethrins, and organochlorines also exert their toxic action by interfering with nerve cell function (Schettler, et al 2000:81).

Many symptoms and illnesses, each described in their own particular jargon, have one common cause: chemical exposure. The main target of chemical exposure is the brain, which mediates the orientation of the symptoms. The objective demonstration of the effects of chemicals is obtained through measurements of key brain functions and psychological performance, eg. balance, reaction time, recall memory, tension-anxiety, anger, depression, confusion, fatigue, irritation, headache and nausea, among others (Kilburn 2001).

These symptoms, described in negative (diminishment of performance) terms, are representative of my previous and current state of health in regard to symptoms expressed since my unit was treated for termites.

Material Safety Data Sheet on the pesticide "Solaris", containing bifenthrin:

Signs of overexposure may be displayed by tremors, muscle fasciculations<sup>2</sup>, ataxia, spasms, hyperexcitability, hyperactivity and convulsions ([http://www.ortho.com/content/products/Solaris\\_msd/6104.cfm](http://www.ortho.com/content/products/Solaris_msd/6104.cfm)).

Whether jogging, or working at my computer, I have experienced frequent sensations of weakness. In jogging, this was apparent in my legs, and while at my computer, my right forearm.

In regard to spasms and twitching, I have noticed during 2001 and up to the present a vastly increased incidence of acute muscle spasm in my back and neck, leaving me very sore and with much reduced head and bodily mobility/flexibility (due to very bad pain). As well, I have noticed a much increased frequency of muscle twitching over the past year. This might be an eyelid, a finger or a part of a shoulder muscle. Every few weeks I experience an incident of each problem. The symptoms and discomfort might last for days before reasonable relief is generated spontaneously (the symptoms go away).

### ***TOXICITY – COMBINED WITH STRESS (quotes and paraphrases)***

A combined exposure to high doses of pyridostigmine bromide (PB), N,N-diethyl m-toluamide (DEET), and Permethrin leads to a significant toxicity and neurological dysfunction (Abou-Donia et al., J. Toxicol. Environ. Health, 48: 35-36, 1996). We investigated the effects following combined exposure to low doses of these chemicals with stress, simulating the daily exposure experienced by veterans to these chemicals during Persian Gulf War... animals subjected to both chemical treatment and stress exhibited a dramatic increase in BBB [Blood Brain Barrier] permeability..., a significant decrease in brain AChE activity, a decrease in m2 muscarinic Ach receptor ligand binding density in midbrain and cerebellum, and a significant neuronal cell death associated with a reduced MAP-2 expression in the cerebral cortex and the hippocampus. These results underscore that, when combined with stress, exposure to even low doses of PB, DEET, and permethrin, that produce minimal effects by themselves, leads to a significant brain injury (Abou-Donia 2001).

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<sup>2</sup> "Fasciculations" means involuntary contractions or twitching, and "ataxia" means a loss of the power of muscular coordination (Stedman's Medical Dictionary 1976: 510,135).

This research relates to my condition because, for most of the year 2001, during which I was exposed to the termiticide vapors entering my unit, I was 'at war' with a number of nearby Dept. of Housing tenants who were accusing me of causing profound interference to their TV reception (with my two computers via the common antenna situated on my roof). During this period, I received exceedingly mixed and contradictory messages from the Department of Housing (DOH), leading to huge blowups with residents, and ultimately no assistance whatsoever in physically addressing the reception problem. I lost a considerable amount of time in regard to my PhD studies, and also experienced financial distress through paying a technician from the Australian Communication Authority to test the antenna line, and in numerous faxes to both the Authority and the DOH. When I noted these circumstances in the presence of my doctor, he immediately referred me to the above research.

## **INERTS**

### **General (quotes)**

"Inert ingredients" (inerts) are chemicals used in pesticide products to make the pesticide more potent or easier to use. Solvents, surfactants, propellants and carriers are some of the kinds of ingredients commonly used as inerts. Despite their harmless sounding name, so-called inerts include many dangerous chemicals that can cause cancer, reproductive harm, nervous system damage and other health effects. However, their identity remains largely secret to the general public. The U.S. Environmental Protection Agency (EPA) requires that only 0.3 percent of these chemicals be disclosed on pesticide product labels. In 1987, EPA unveiled a policy designed to "reduce the potential for adverse effects" from the use of the 1200 inert ingredients used in pesticide products at that time and "encourage the use of the least toxic inerts available".

We analyzed the success of EPA's policy and found that:

- 1. The number of inert ingredients has almost doubled since 1987, increasing 93 percent from 1200 to 2311 ingredients. These ingredients are used in approximately 21,000 pesticide products.**
- 2. Many of the chemicals classified as inerts are hazardous to public and/or environmental health. More than a quarter (26 percent) of inert**

ingredients have been identified as hazardous by state, federal or international agencies. These include chemicals that can cause cancer, reproductive effects, harm to the nervous system and damage to the environment.

**3. EPA mandates public disclosure of certain hazardous inert ingredients added to pesticides. This disclosure has helped reduce their use.** Despite this limited success, EPA itself has since remained inert in the true sense of the word, not requiring disclosure of a single new inert ingredient in pesticide products in ten years. **Currently, EPA allows manufacturers to keep secret from the public the identities of more than 99 percent of all ingredients used as inerts.**

Government agencies already recognize that 26 percent of inerts are actually chemically, biologically, or toxicologically active. These chemicals are able to cause cancer, reproductive and nervous system harm, and other health and environmental problems (NCAP 1998:iv,5) (emphasis added).

**Specific (quotes) – DEHA, DEHP, Nonylphenol, Phenol, Xylene, Ethylbenzene, Butanol, Cumene, 1,2,4-Trimethylbenzene, Aromatic Hydrocarbons, Mineral Oil, Silica, Toluene**

#### **Some Companies Continue Use of Toxic Inerts**

The labeling policy is not completely effective. At least eleven manufacturers continue to use seven of the eight List 1 "Inerts of Toxicological Concern." These include four chemicals that can cause cancer in laboratory animals, two chemicals that are acutely toxic to aquatic organisms (one of which bioaccumulates) and one that can harm the nervous system as well as the liver and kidneys. (See Table 3.) These seven chemicals are found today in at least 40 pesticide products, ranging from herbicides used on rice, soybeans and wheat, to aquatic herbicides used in bodies of water, and red dye added to fungicides used to protect seeds from disease. (See Table 4.) Four of these chemicals (DEHA, DEHP, nonylphenol, and phenol) remain in use while companies challenge their inclusion on the list (EPA 1997d).

**Table 2**  
**Examples of Hazardous Inerts Classified by EPA as “of Unknown Toxicity”**

**Carcinogens:** cristobalite; o-phenylphenol, sodium salt; FD&C Violet No. 1; butylated hydroxyanisole, safrole

**Hazardous under the Superfund Amendments and Reauthorization Act:** cumene, cyclohexanol, methyl ethyl ketone, sodium nitrite, triethylamine

**Occupational Hazards:** vinyl toluene, isopropylamine, chloropicrin, naphthalene, tetrachloroethane

**Air and Water Pollutants:** ammonium thiocyanate, chlorotoluene, dodecylphenol, monochloroacetic acid, tetramethylbutyl phenol

**Table 3**  
**Currently Used Inerts “of Toxicological Concern”**

<b><u>Inert</u></b>	<b><u>EPA Concern</u></b>
di-2-ethylhexyladipate (DEHA/DOA)	carcinogen
di-2-ethylhexylphthalate (DEHP/DOP)	carcinogen
hydroquinone	acute toxicity to aquatic organisms
isophorone	carcinogen
nonylphenol	acutely toxic to fish, bioaccumulates
phenol	neurotoxic, liver and kidney damage
Rhodamine B	carcinogen

Sources: EPA 1985, 1996, 1997a

[Note: I have provided only Tables 2 and 3 as part of this quote.]

At least 366 inert ingredients, or 16 percent of the total number of inerts, have been or are currently used as active ingredients in pesticides. These include toluene and xylene<sup>3</sup>, chemicals the federal Agency for Toxic Substances and Disease Registry considers toxic to the fetus and nervous system, respectively (U.S. Dept. Health and Human Services 1994, 1995b) [end of quote] (Marquardt, Knight & Cox 1998:5-6).

<sup>3</sup> See ahead for toxicological details on toluene.

High doses of xylene have produced effects in the liver, kidney, lung, spleen, heart and adrenals of laboratory animals. Rats and mice exposed to xylene during pregnancy showed embryo/fetotoxic effects.

Ethylbenzene is moderately toxic by ingestion and mildly toxic by inhalation and skin contact. It is irritating to the eyes, skin, and mucous membranes. In high concentrations, ethylbenzene may cause stupor and coma.

Butanol is moderately toxic by ingestion, is irritating to skin and is severely irritating to eyes. Prolonged exposure may cause headache, dizziness, drowsiness and nausea. Long term overexposure may cause some loss of hearing.

Cumene is moderately toxic by ingestion or inhalation. It is a central nervous system depressant, with potent narcotic effects of long duration.

1,2,4-Trimethylbenzene is moderately toxic by ingestion or inhalation... It can cause central nervous system depression, anemia, and bronchitis.

Aromatic hydrocarbons may cause chemical pneumonitis if aspirated. Chronic exposure to aromatic hydrocarbons may cause headaches, dizziness, loss of sensation, and liver and kidney damage.

Mineral oil may be a hazard if it is inhaled.

...longterm exposure to crystalline silica may cause silicosis. Silicosis is a disabling, progressive and sometimes fatal lung disease. There is also some evidence that crystalline silica may be a cancer causing agent.

**Health effects of exposure to formulated products:** Bifenthrin formulations have moderate oral toxicity, and low to moderate inhalation toxicity.

**Signal word and definition:** Talstar® WP: **WARNING** - May be fatal if swallowed. Harmful if inhaled or absorbed through skin. Causes eye irritation (Information Ventures Inc. 1995).

Adverse effects on the nervous system are the critical effects of concern from inhalation exposure to toluene as evidenced by results from studies of workers acutely or chronically exposed to toluene in workplace air, studies of volunteers under controlled acute exposure conditions, and studies of chronic solvent abusers predominantly exposed to toluene. Observed effects include reversible neurological symptoms from acute exposure progressing from fatigue, headache, and decreased manual dexterity to narcosis with increasing exposure level, degenerative changes in white matter in chronic solvent abusers, and subtle changes in neurological functions including cognitive and neuromuscular performance, hearing, and color discrimination in chronically exposed workers.

Studies of human color vision impairment suggest that vision impairment results from chronic, rather than acute, exposure to toluene (Muttray et al. 1995, 1999; Zavalic et al. 1998a, 1998b, 1998c).

Toluene exposure produced microscopic changes in ovarian structure and a reduction in sperm count and the weight of epididymides in rats (Ono et al. 1996; Tap et al. 1996)... Ng et al. (1992b) reported a significant increase in spontaneous abortion for women employed in an audio speaker factory and exposed to 50-150 ppm (mean of 88 ppm) for 10 years...

Current data provide suggestive, but not conclusive, evidence that toluene may cause some endocrine effects.

The effects of toluene have not been thoroughly studied in children, but the limited available data suggest that the nervous system is also the most likely target of toluene toxicity in children... persistent central nervous system dysfunction (e.g., Byrne et al. 1991; Devasthanan et al. 1984; King et al. 1981) (Syracuse Research Corporation 2000:12,64,70,141,144).

## **Dangerous Inerts Downgraded In Toxicity Categorization Against US EPA Policy (Quotes)**

Silica, crystalline quartz [CAS number] 14808-60-7... classified as "reasonably anticipated to be carcinogenic" by NTP... According to EPA policy, chemicals classified as carcinogens by the National Toxicology Program or the International Agency for Research on Cancer should be on

List 1: Inerts of Toxicological Concern. For 16 inert ingredients, this policy has not been followed (NCAP 1998:5).

The National Toxicology Program has found that eight chemicals used as inerts “may be reasonably anticipated to be carcinogenic” (NCAP 1998:5, citing: U.S. Department of Health and Human Services 1994b).

Six of the eight chemicals are on List 3 and one is on 4B, even though all seven should be on List 1: Inerts of Toxicological Concern. Under Proposition 65, the state of California identifies ten chemicals used as inerts as carcinogenic (NCAP 1998:5, citing: Calif. EPA 1996).

How many more carcinogens are used as inerts that we do not know about? Under the current policy, we will never know. Inert ingredients and the full formulations that contain them are not tested for carcinogenicity, only the active ingredient is. Meanwhile, the general public and the environment are victims of malignant neglect (NCAP 1998:5).

I wish to point out here that, over the past 14 months since December 7<sup>th</sup> when the termiticide was applied to my unit, I have experienced chronic joint and muscle pain, headaches, dizziness, numbness on the face and right forearm (loss of sensation), considerable skin and eye irritation, very dry (bleeding) nasal mucous membranes, enormous difficulty in concentrating, and loss of coordination (including constant mis-typing, failing to judge distance in grasping items, and staggering on my feet). In terms of eyesight, any color impairment, in addition to my rapidly deteriorating general vision, that I might (or already have) experience(d) would have a very negative impact on any future artistic endeavors and potential income (I am a professional artist and paint photorealistic and impressionist landscapes in oils and acrylics).

## PYRETHROIDS

### *GENERAL (quotes)*

Pyrethroids are synthetic chemical insecticides that act in a similar manner to pyrethrins, which are derived from chrysanthemum flowers. Pyrethroids are widely used for controlling various insects. Pyrethroids can be used for public health mosquito control programs without posing unreasonable risks to human health when applied according to the label.

Pyrethroids are considered to pose slight risks of acute toxicity to humans, but at high doses, pyrethroids can affect the nervous system (EPA Office of Pesticide Programs (OPP) 2000:1,3).

Naturally-occurring pyrethrins or synthetic pyrethroids are insecticides that also exert their toxic action by interfering with the electrical activity of nerve cells. They are sometimes divided into Type I and Type II compounds. Type I cause repetitive firing of nerve cells while Type II cause nerve inexcitability by blocking cell depolarization (Schettler, et al 2000:83).

Pyrethroids, pyrethrins, and organochlorines also exert their toxic action by interfering with nerve cell function. By modifying the permeability of nerve cell membranes to various ions they may either increase or decrease the excitability of nerve cells causing repetitive firing or prolonged inactivity. Studies done in developing animals show that each of these classes of insecticides may also permanently alter neuroreceptor levels in portions of the brain and modify animal behavior as a result (Schettler, et al 2000:84-85).

#### Medical Surveillance:

Initial medical screening: Employees should be screened for history of certain medical conditions... which might place the employee at increased risk from /pyrethroid/ exposure.

#### Populations at Special Risk:

Chronic respiratory disease: In persons with chronic respiratory disease, especially asthma, the inhalation of /pyrethroids/ might cause exacerbation of symptoms due to its sensitizing properties (Toxnet 2002) [emphasis mine].

#### Pyrethroids and Health Effects

Pyrethroids have irritant and/or sensitizing properties. They are not easily absorbed through the skin, but are absorbed through the gut and pulmonary membrane. Tests on some pyrethroids on laboratory animals reveal striking neurotoxicity when administered by injection or orally... (Beyond Pesticides [online] 2002, citing Reigart et al. 1999).

The World Health Organization explains that synthetic pyrethroids are neurotoxins acting on the axons in the peripheral and central nervous systems by interacting with sodium channels in mammals and/or insects (Beyond Pesticides [online] 2002, citing WHO 1999 [full reference not provided]).

### **Endocrine Disruption and Breast Cancer**

Many pyrethroids have also been linked to disruption of the endocrine system, which can adversely affect reproduction and sexual development, interfere with the immune system and increase chances of breast cancer. Pyrethroids contain human-made, or xenoestrogens, which can increase the amount of estrogen in the body (Beyond Pesticides [online] 2002, citing Garey et al. 1998).

Synthetic pyrethroids are also known as endocrine disruptors. Other toxicological properties include: liver damage when subjected to longterm exposure, allergic reactions and asthmatic attacks. The USEPA has found that many of the pyrethroids may also be carcinogenic. For this reason, the levels of synthetic pyrethroids in foods and the environment are always under close scrutiny ([www.sge.com](http://www.sge.com) 2002).

When tested, certain pyrethroids demonstrate significant estrogenicity and increase the levels of estrogen in breast cancer cells (Beyond Pesticides [online] 2002, citing Go et al. 1999).

Because increased cell division enhances the chances for the formation of a malignant tumor in the breast, artificial hormones, like those found in pyrethroids, may increase breast cancer risk (Beyond Pesticides [online] 2002, citing PCBR 1996 [full reference not provided]).

...synthetic pyrethroids are stable and persist in the environment much longer [than pyrethrins]... in areas with limited sunlight, such as grain silos and subway tunnels, pyrethroids can persist for months (Beyond Pesticides [online] 2002).

The fact that I had warned the DOH 4 times in 4 years (before I accepted this unit) of my asthmatic sensitivity to chemicals had no bearing on the DOH's negotiation of potentially dangerous procedures on my unit (i.e. there was no "medical screening" as the previous Toxnet 2002 recommends for employees). In the workplace environment, Occupational Health & Safety, and Duty of Care concerns would be in order (as a matter of law). There is, apparently, no DOH policy linking tenants' medical concerns with prescribed treatments, such as the application of a termiticide to a unit in which a tenant resides. As well (noting the details below), if the toxicity, vapor pressure, etc of the *inerts* carried in the pesticide mixture are not tested and fully accounted for, then a Standard will not have embraced the extra potentials introduced by these 'invisible' compounds. Given that 'inerts' are toxic and *move* (i.e. they can penetrate plastic), that leaves the Standard, the professional standing of the pesticide administrators, and any concept of Duty of Care essentially bankrupt.

### **SPECIFIC (quotes)**

#### **Talstar, Biflex, Bifenthrin**

BIFENTHRIN - This chemical is a synthetic pyrethroid, the use of which has recently been extended to include termite control. It has a slight odour, noticeable after use. Like chlorpyrifos, it is registered for new and existing buildings (Ministry of Fair Trading [no date]:2).

#### **Bifenthrin (Talstar, Biflex) Pesticide Tolerances for Emergency Exemptions 9/00**

##### **IV. Aggregate Risk Assessment and Determination of Safety**

##### **B. Exposure Assessment**

3. From non-dietary exposure. The term "residential exposure" is used in this document to refer to non-occupational, non-dietary exposure (e.g., for lawn and garden pest control, indoor pest control, termiticides, and flea and tick control on pets).

Bifenthrin is currently registered for use on the following residential non-dietary sites: lawns to control flea infestation, pets and as a termiticide. Registered termiticide use of bifenthrin constitutes a chronic exposure scenario; however, the exposure is considered negligible, considering the application technique of the termiticide use (buried underground) and the fact that vapor pressure of bifenthrin is extremely low. The Agency conducted a residential exposure assessment for the lawn care uses of bifenthrin. This risk assessment is based on post-application to treated lawns (turf use), a worst case scenario estimate of residential exposure. An assessment of applicator exposure was not included since the

registered products are primarily limited to commercial use and, therefore, applied by professional lawn care operators. Inhalation, dermal and oral non- dietary routes of exposure were evaluated by this short-term and intermediate-term risk assessment. For adults, the routes of exposure from these registered residential uses include dermal and inhalation, and for infants and children, the routes of exposure include dermal, inhalation, and oral (non-dietary) (EPA 2000).

Studies show bifenthrin to be relatively insoluble in water. Its half-life in soil can range anywhere from 7 days to 8 months depending on the soil type and the amount of air in the soil (Beyond Pesticides [online] 2002, citing ETN 1995).

EPA has classified products containing bifenthrin as toxicity class II (I = most toxic, IV = least toxic), and the word WARNING must appear on all product labels... Scientists are particularly concerned about possible bioaccumulation in birds (Beyond Pesticides [online] 2002).

The primary goal of the project was to determine the individual and synergistic effects of an important herbicide (atrazine) and insecticide (bifenthrin) in Texas on natural lake communities... Bifenthrin had effects at concentrations much lower than atrazine and potentially had a greater impact on aquatic systems (Hoagland & Drenner 1989 [online]).

The above theme of so-called "worst case scenario estimate of residential exposure" is entirely inadequate, since it deals with a superficial application that although likely to be acute, fails to address the vitally important scenario of potential longterm exposure to bifenthrin and inerts via chemical diffusion into concrete and vaporisation into a residence.

#### CHRONIC TOXICITY

Repeated exposure of laboratory animals to bifenthrin caused tremors.

*Carcinogenic:* The EPA has classified bifenthrin as a Class C carcinogen, a possible human carcinogen<sup>4</sup>.

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<sup>4</sup> "Synthetic pyrethroids are generally not considered carcinogens. However, both bifenthrin (TALSTAR) and permethrin (AMBUSH) are considered by the Federal Environmental Protection Agency (EPA) to be weak carcinogens" (New Jersey Department of Environmental Protection 1999).

## ACTION ON ANIMALS

Bifenthrin is moderately toxic to many species of birds, very highly toxic to fish, crustaceans and aquatic animals, and is toxic to bees (Total Environment Centre 2001, citing: FMC 1993; Extoxnet 1995; PESKEM 1995).

**Bifenthrin is neurotoxic...** The inert ingredients in some bifenthrin formulations include aromatic hydrocarbons, 1,2,4-trimethylbenzene, xylene, surfactant blend, ethylbenzene, cumene, 1-butanol, quartz, and mineral oil... (Information Ventures Inc. 1995) (emphasis added).

### Long-term toxicity/carcinogenicity studies

#### Mice

In a lifetime feeding study technical bifenthrin (purity 88.4%) was administered continuously over at least 20 months in the diet of mice... The predominant clinical sign of toxicity consisted of tremors occurring at 500 and 600 ppm... [there is a] possible tumorigenic potential of the compound. In addition, an increased incidence of liver hyperplasia<sup>5</sup>/adenoma<sup>6</sup>/carcinoma was observed in the high dose males. A significant trend was noted for carcinoma incidence... (Bosshard 2002).

### Pesticide Tolerance for Bifenthrin

The toxicological data considered in support of the proposed tolerance include:

8. A carcinogenicity study with mice fed diets containing 0, 50, 200, 500, or 600 ppm... for 87 weeks (males) and 92 weeks (females) with a statistically significant trend for hemangiopericytomas of the urinary bladder of male mice... There were also significant dose-related trends in hepatocellular carcinomas and in the combined hepatocellular adenomas and/or carcinomas in male mice. Female mice had significantly higher

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<sup>5</sup> *Hyperplasia*: "An increase in number of cells in a tissue or organ, excluding tumor formation, whereby the bulk of the part or organ is increased" (Stedman's Medical Dictionary 1976:673).

<sup>6</sup> *Adenoma*: "An ordinarily benign neoplasm of epithelial tissue in which the tumor cells form glands or glandlike structures in the stroma; usually well circumscribed, tending to compress adjacent tissue rather than infiltrating or invading (Stedman's Medical Dictionary 1976:23).

incidences of combined lung adenomas and carcinomas in the 50, 200, and 600 ppm groups, although there was no significant dose-related trend.

...Feeding studies using structurally related pyrethroids, which were classified as Group C carcinogens by the CPSC, have resulted in increased incidences of lung tumors in female mice (EPA 1997).

The present study was conducted to examine the effect of organochlorine (Heptachlor, Benzene hexachloride (BHC)), organophosphorus (Malathion, Monitor) and pyrethroid (Karate, Talstar) insecticides on the thyroid secretory function in rats... Body weight was not affected by treatment with any insecticide except Talstar... Treatment with both of the pyrethroid insecticides similarly induced significant suppression ( $P < 0.01$ ) of serum  $T_3$  and  $T_4$  levels, and concomitant stimulation ( $P < 0.01$ ) of TSH concentrations... **These data indicate that immense care is warranted in the use of insecticides, because they not only affect the liver, kidney and other organs but also may alter the activity of the endocrine glands** (Akhtar, Kayani, Ahmad & Shahab 1998) (emphasis added).

Potential Health: Effects from overexposure result from either swallowing, inhaling or coming into contact with the skin or eyes. Symptoms of overexposure include bleeding from the nose, tremors and convulsions (<http://www.doyourownpestcontrol.com/talstar.htm>:4).

Over the last year, I have experienced a constant dry and bleeding right nasal passage (very much out of the ordinary), as well as a very sore bleeding tongue.

## Phostrogen Safety Data Sheet

### 2. COMPOSITION / INFORMATION ON INGREDIENTS

Composition:

Pyrethroid Pesticide containing Bifenthrin (0.04 g/L)

#### Hazardous Ingredients

Bifenthrin Maximum 0.004% (CAS No: 82657-04-3)

### 3. HAZARDS IDENTIFICATION

#### Inhalation:

May cause coughing and mild irritation

([http://www.pbi.co.uk/phostrogen\\_msds/bugfree.htm](http://www.pbi.co.uk/phostrogen_msds/bugfree.htm)).

During most of 2001 (starting around April of 2001), my nine year old son had a chronic cough that was elicited at the slightest exertion. My son slept at my unit, during this period, five nights out of seven and complained of stomach ache and nausea almost every morning.

## CHILDREN

1. Pesticide poisoning is extremely problematic because mild to moderate pesticide poisoning symptoms can be easily misdiagnosed as stomach-flu, bronchitis or asthma (Reeves, Schafer, Hallward & Katten 1999:17). Even severe pesticide poisoning in infants has been misdiagnosed as aneurysm, head trauma, diabetic acidosis, severe bacterial gastroenteritis, pneumonia and whooping cough (Reeves, Schafer, Hallward & Katten 1999:17, citing Solomon & Mott 1998; Zweinerd & Ginsburg 1988).
  
2. Children are much more susceptible to poisoning than adults for a number of reasons:
  - ◆ They inhale a greater volume of air in relation to their body weight than adults, and so receive a larger dose (NCAP 2000:12-14, citing NRC 1993).
  - ◆ They have a greater skin surface area proportional to body mass. This means that equivalent exposures in an adult and child results in a greater dose for the child (NCAP 2000:12-14, citing NRC 1993).
  - ◆ They play nearest the sites of application (NCAP 2000:13).
  - ◆ They display hand-to-mouth behavior (NCAP 2000:12,14).
  - ◆ Children's nervous systems are more susceptible to the impact of nerve poisons (NCAP 2000:12,14:4, citing NRC 1993; Watanabe 1990).

- ◆ Children cannot effectively detoxify certain chemicals (compared to adults) and so are much more vulnerable to poisoning (NCAP 2000:12,14, citing NRC 1993).
- ◆ The dividing cells in children's bodies are more susceptible to the impact of cancer-causing chemicals (NCAP 2000:12,14, citing NRC 1993).
- ◆ Their immune systems, being underdeveloped, are more prone to damage from exposure to foreign compounds (NCAP 2000:12,14, citing Repetto & Baliga 1996; NRC 1993).

## PART 2

### BIFENTHRIN ("BIFLEX" or "TALSTAR") URLs

<http://www.tec.nccnsw.org.au/member/tec/projects/tcye/tox/Bifenthrin.html> --

TECHNICAL INFO

<http://www.fmc-apgspec.com/htalstar.htm> -- PRODUCT INFO

<http://www.hclrss.demon.co.uk/bifenthrin.html> (the "l" in "hclrss" could be a "1") –

BIFENTHRIN DATA SHEET

<http://www.fs.fed.us/foresthealt/pesticide/bifenthr.html> -- PESTICIDE FACT SHEET

<http://irptc.unep.ch/pops/newlayout/search.htm> -- SYNTHETIC PYRETHROIDS

(TOXICITY OF BIFENTHRIN)

<http://www.inchem.org/documents/jmpr/jmpmono/v92pr04.htm> -- FIRST DRAFT

PESTICIDE RESIDUES IN FOOD: 1992 EVALUATIONS

<http://pmep.cce.cornell.edu/profiles.insect-mite.abamectin-bufen...> (rest of URL

incomplete) – BIFENTHRIN PESTICIDE TOLERANCES FOR EMERGENCY

EXEMPTIONS 9/00

Sincerely,

.....

(Murray Thompson)

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