**Submission to People's Inquiry – 71**
**Exposure: lived in spray zone**
**Samuel John Budd**
**Oral testimony: No**

To: People's Inquiry Inc
Attention: Hanna Blackmore

Dear Hanna,

Having read your article in the Western Leader dated 3rd March, 2006, I am writing to say I was one of the Aqua/Maf people who was affected by the aerial spraying in West Auckland.

My medical condition being (Adrenogenital Syndrome – taking Steroids)

Having visited my local doctor, Doctor at Ratanui Medical Centre, I was then asked to see a Maf Doctor at Pt Chev. He came to the conclusion from examining me it was the change in soap powder used by my wife in our laundry washing. As we had not changed our laundry soap powder, this was definitely not the case.

From this visit I went straight to Aqua in Remuera Road, and demanded to see someone. Within minutes I had 3 ladies from Aqua discussing my medical condition. I was put straight on to their register and was notified from then on to get out of our house in West Auckland, and go to their Early Morning Breakfasts. I was also paid for my medical bills.

To come to a verdict on this **so called** Safe Spraying Episode I wish those responsible are brought to and held to some sort of justice.

Yours faithfully.
Mr Samuel John Budd

***End***
**----------**

**Submission to People's Inquiry – 73**
**Exposure: lived in both Tussock Moth spray zone (hot spot) & PAM**
**Hassanah Thompson**
**Oral testimony: Yes**

Submission to Peoples inquiry

I have been in the unfortunate situation of being on the receiving ends of both the spraying for the painted apple moth and the white spotted tussock moth. Back in 1996 I was living in Kohimarama in the Eastern Suburbs in the "hot zone" when the spraying started. The plane flew directly over the house, making in shake and covering the car with the stuff, it also pervaded the house, as it was summer and the windows were open. I also managed to time the run to the car wrong on a couple of occasions, and got caught directly in the dumping.

After this had been going on for about a month I started to get headaches. Most unusual for me, as that had never been a previous issue for me. They gained in frequency and intensity until one very bad day at work, when I collapsed.

I woke up on the floor at work with worried faces around me, whilst the Registered Nurses who worked for our organization checked my pulse etc. (I work in recruitment and an arm of our business dealt in the health field). One noticed that one of my pupils had blown out and when she asked me to squeeze her hands, my left side had weakness and I couldn't squeeze as strongly on that side, also the left leg was not as reactive to the normal tests. I was taken to my doctor, who after consulting with the Auckland Hospital Specialists sent me down to the emergency department.

They suspected I had a brain tumour, and were understandably concerned at the way I presented at the grand old age of 26. After enduring a whole battery of tests including CAT scan, Lumbar Puncture etc they discharged me 2 days later. The last specialist I saw said that they didn't know what was wrong with me but that they couldn't find anything medically to explain my symptoms.

Emotionally wrecked, after spending 2 days thinking I had a brain tumour or something as equally awful, I went home. Still with the headaches, but this time armed with Codeine, and the left side weakness a bit better but still there. It took me more than 2 months to return to work full time, as I could only work part time initially as by midday I was physically shattered and had to go home to sleep. After all this, I now experience what the Neurologist diagnosed as "atypical migraine". I had never my whole life had a migraine let alone a headache issue. But they continue to this day.

I was later interested to learn that others in the area were presenting at Auckland Hospital with exactly the same symptoms (including the daughter of my solicitor). All of them lived or worked in the Tussock Moth spray zone.

In 2002 I was living in West Auckland when the spray started again – this time for the Painted Apple Moth. I was originally on the outskirts of the spray, but as the zone was expanded I ended up back in it again. After last time's experience I wasn't going to take risks, I started to evacuate myself and went to stay over at my parents who still lived in East Auckland. But that only worked sometimes; occasionally the spraying happened a bit unannounced, like a Sunday morning once.

In the middle of the spray program I fell pregnant, unfortunately at 9 weeks I miscarried.

As this point I started remembering the increase in miscarriages in the spray zones. As an example when I lived out East, there was a street not too far from my house that had 6 pregnant women living there – all but one miscarried, and the last – she fled overseas to take herself and her unborn child out of the zone. Or another – a woman who didn't live in the spray zone but worked in it – miscarried twice.

So this time I moved house. I was still living out west but far enough away, and although I had to drive though the spray zone to get to work in the city, I would leave home very early to miss it. I fell pregnant again and now have a beautiful two and a half year old son.

I also do volunteer work and by its very nature I come into contact with a number of midwives in the West area. They were becoming increasingly concerned during the PAM spraying at the high levels of miscarriage being reported amongst their women, and later a few midwives voiced to me their concern that they were starting to see cleft palate abnormalities, much more than the normal rate expected. I also heard concerns about the number of stillbirths that in one three month period topped the whole of the previous year's cases, and also the number of clients that would present with 'spotting' a couple of days after a spray. One group even voiced their concerns with the relevant government body. To be told that if the midwives themselves wanted to collect that data they would be more than willing to look at it!!!

Now the argument I have heard ad nauseam is that you can't prove that the spray caused all these issues…But I think that is the wrong way of looking at it and the wrong question. Mine would be, Prove it's not!

I find it utterly disgusting that a large population group were sprayed with a formula that had previously only EVER been used on agricultural land or forestry in a very sparsely populated area at these rates and frequency. And by EVER I mean anywhere in the world. At the very least, proper systems should have been put in place. The general health of the population should have been measured thoroughly, prior to the spraying beginning, and thoroughly monitored during and followed up afterwards. What happened in East and West Auckland would never have made in through a medical ethics committee if it had been proposed as an investigation into the effects of spraying.

History is littered with examples of very large failures that the Government should have learned from; do these words and what happened after mean anything?

Thalidomide
DDT
Asbestos

***End***

***----------***

**Submission to People's Inquiry – 74**
**Exposure: lived in both the Tussock Moth and PAM spray zones**
**Jean Manning-Voyce. J.P.**
**Oral testimony: Yes**

Note from the Convenor:

Jennie sadly died – almost one year to day after giving evidence to the People's Inquiry.
She and I had many conversations over the time of the Inquiry, and I was a great admirer of her spirit and humour in spite of her severe asthma problems. She will be sadly missed.

We have been unable to trace any of her children or relatives – but if anyone reading this can help in tracing Jennie's family, they might like to have a copy of Jennie's videoed submission to the Inquiry.

Hana Blackmore

*End*

**Submission to People's Inquiry – 75**
**Exposure: N/A**
**Dr Meriel Watts**
**Oral testimony: Yes**

**Submission to The People's Inquiry in to Aerial Spraying of Foray 48B**

Dr Meriel Watts,
Co-ordinator
Pesticide Action Network Aotearoa New Zealand.
March 2006

---

**Introduction**

For the last 16 years I have worked on behalf of spray–affected people and their communities at a local, national, regional and international level.

I am currently coordinator of Pesticide Action Network Aotearoa New Zealand, a member of the Steering Council of Pesticide Action Network Asia and the Pacific and Co-convenor of its Pesticides Task Force. Prior to that I have worked for the Soil & Heath Association and Greenpeace on pesticide issues. I have sat on numerous government bodies relating to pesticides, including the Pesticides Board, various Ministry of Agriculture (MAF) spray drift working groups, the Agrichemical Trespass Ministerial Advisory Group, the Ministry for the Environment's Reference Group for a National Pesticide Risk Reduction Strategy, and am currently on the Agricultural Compounds and Veterinary Medicines Advisory Committee.

On all those committees I have been the token representative of the interests variously of consumers, the community, the environment, and/or organic growers, depending on the context. Invariably mine has been a voice of one against the many, and discounted because I represent the views and needs of the spray-affected community - and therefore do not have any expertise, or am biased, or operating from a basis of emotion/hysteria. Tired of having my views discounted for those reasons, I set out to remedy the situation. I studied for a Masters degree in an eclectic mix of environmental economics and law, planning law and entomology – followed by a PhD on ethical pesticide policy.

You will probably not be surprised to learn that I am still largely regarded by those same people in elevated positions of authority as 'not to be taken heed of' because I still work on behalf of the community. It was illuminating for me to be asked by these people, when I was still doing my PhD – so what will you do when you have finished – will you stay on at the University, will you work for the government? No I said, I will continue to do what I have done for years, work for the community.

The reason for telling you this story is because it is very pertinent to the content of my submission to you.

My other educational background and practical experience includes agricultural science and natural health therapies.

In the first aerial spraying programme over Auckland – Operation Evergreen to eradicate the White Spotted Tussock Moth (WSTM) in East Auckland in the late 1990s – I was a member of the Community Advisory Group established by the Ministry of Agriculture (MAF) and of the Operational Science Group.

I was also a member of the Painted Apple Moth Community Advisory Group (PAM CAG) from its inception, and for a short period, its non-voting observer on MAF's Technical Advisory Group.

I wish to provide information on:

1. The risk assessment process used to decide if the aerial spraying of Foray 48b over West Auckland was acceptable from a public health perspective and why it failed to identify the problems that occurred.

2. The chemical ingredients in the spray.

3. Community participation in the PAM programme

4. Recommendations for policy principles that should be included in any further biosecurity operations.

## 1. Risk assessment of Foray 48 b

In order to justify the aerial spraying programme to the West Auckland community, the government commissioned a health risk assessment (HRA) of the pesticide it was to use – Foray 48B. The HRA concluded that although there was evidence that some health effects might be "complained of" by some people, the risks to human health were "small" (Kalemba et al 2002).

Subsequent political interpretation by medical personnel, MAF technical personnel and the Minister of Agriculture led to the expressed view firstly that any health effects will be "insignificant" (Kelly 2001), and then that the spray has a "proven safety record" (Sutton 2002a), has a "clean bill of health" and is "harmless to humans and animals" (Kelly 2002).

Over the course of time there was eventually an acknowledgement by politicians and some medical personnel that some health effects had occurred (e.g. Sutton 2000b), but they regarded these as being 'insignificant' and 'acceptable', often blaming them on hysteria or anxiety caused by the people who drew attention to the health effects.

### *1.1 The non-science of risk assessment*

Risk assessment processes are widely used by the New Zealand government to determine which course of action to take, and then to justify that course of action. Broadly, with regards to exposure to chemicals, they look at the hazard inherent in the chemical, the level of exposure people are likely to experience, then determine the risk of significant effects resulting from that exposure, and lastly decide whether this risk of significant effect is acceptable.

The process is fundamentally flawed by assuming simply that

risk = hazard x exposure

- i.e. the hazardous properties of a particular chemical as determined in tests on laboratory animals and extrapolated to the average person, and the exposure that person is likely to experience. It is a flawed concept because it fails to acknowledge the impact of individual genetic susceptibilities and personal health status, together with environmental stressors including other chemicals on the way in which some people react to chemicals. Hence it fails to recognise that some people react much more intensely to a chemical, and at much lower levels of exposure than the average, and it fails to recognise multiple chemical sensitivity (Watts 2000, chapts 3,4).

In reality, the risk equation should really be:

risk = hazard x exposure x people x environment.

Nevertheless the standard risk assessment process, used for the PAM programme, is generally promoted as being 'scientific'. Which means that it is 'not to be questioned by the community'.

In fact there is a great deal in a risk assessment process that is far from scientific, and which directly influences the outcome of the process: it is a highly subjective process, fraught with uncertainty because of a lack of accurate data. It depends on a large number of assumptions and judgements, all of which are guided by the value system of the assessor and his/her institution. Values are inculcated in risk assessment at every step of the way: how risk is defined and the problem structured, what toxicological parameters are judged relevant, what assumptions are made about fate, transport, exposure, and receptor behaviour, which methods are used for handling uncertainty, how much data is gathered, which models are selected for use in estimating risk, how to handle cumulative effects, which data sources are used, how to interpret the findings, etc (Watts 2000, Chapt 3).

### *1.2 Lack of data - neurological effects?*

To illustrate the problem, the first value judgment that is made in a toxicological study on a chemical is what health effects to look for in the animal being subjected to the chemical, and what constitutes a response to the chemical – which is not as self-evident as we would like to assume. Unless a health effect is consciously measured, it is usually overlooked. Typically, potential neurological effects are not generally looked for unless something in the structure of the chemical leads the researcher to believe there might be such an effect. In other words, in this highly scientific process, if you don't think the effect will occur, you don't look for it. I have appended a small extract from my thesis elaborating on this [Attachment 1].

What this means for the people aerially sprayed with Foray 48B is that there has been no assessment of, for example, chronic neurological effects that might arise from that exposure. Specifically no one has carried out any studies to determine if any of the ingredients might contribute to Motor Neuron Disease. This has become interpreted to mean that there is no evidence linking Motor Neuron Disease to Foray 48B because there is nothing in the literature to show any such link. So therefore there is no basis for investigating whether or not the cluster of MND in West Auckland is related to the spray. A self-fulfilling assessment of the situation. More information will be provided on the cases of Motor Neuron Disease by Hana Blackmore.

### *1.3 Failings of the Foray 48B assessment*

I have found the health risk assessments for proposed aerial applications of Foray 48B to exhibit a bias in favour of that application. There is a systematic discounting of community reported effects of exposure to Foray 48B. Where toxicological data is lacking the assumption is made that the effects will not occur, e.g. neurological effects. The risk characterisation, building on its previous assumptions and value judgements then asserts that the risk is small. This conclusion cannot be justified scientifically. The assessment should say that because data on long-term exposure is lacking, the risks from long-term exposure cannot be ascertained.

I have covered some of the failings of the primary risk assessment of the aerial spraying of Foray 48b in my Memorandum to Sir Geoffrey Palmer, January 10, 2003 [Attachment 2].

In summary, it:

- exhibited a conservative value bias that favoured the government's determination to eradicate the Painted Apple Moth by aerial spraying, rather than favouring the protection of the health of the people who would be sprayed;
- consequently did not pay heed to the symptoms reported by exposed communities;
- minimised the significance of potential effects on the effected people;
- significantly underestimated the extent to which people would be exposed to the spray;

- failed to identify the chemical ingredients in the formulated product;
- failed to determine the effects of the mixture of chemicals that constitutes Foray 48B, allowing for synergistic or additive effects, as opposed to assessing each chemical as if it were the only chemical to which people would be exposed;
- failed to determine the effects of ongoing low dose exposure, as opposed to one-off exposure to toxic levels;
- and most particularly, it failed to acknowledge the significance of inhalation of the spray, focusing instead on ingestion and skin contact.

### *1.4 Inhalation effects*

I need to explain the significance of this last point. Some pesticides are known to be much more toxic when inhaled as opposed to ingested: US EPA scientists Whalan & Pettigrew (1998) illustrated this problem with the observation that two organophosphate insecticides - mevinphos and methyl parathion - are equally toxic by the oral route but, when inhaled, mevinphos is 130 times more toxic than parathion.

One of the ingredients known to be in the formulation of Foray 48B used in the WSTM programme and initially in the PAM programme, is benzoic acid.

Whilst benzoic acid is regarded as being of low toxicity when ingested, except to those people allergic to it, there is no known safe level of exposure by inhalation, a common source of exposure for West Aucklanders: a European Commission scientific report stated that "*as the rat inhalation studies showed adverse effects at all doses studied, it is not possible to identify a level of inhalation exposure that is without risk"* (EC 2002).

Benzoic acid was assessed only for its effects when ingested.

### *1.5 Significant and acceptable*

The initial problem is that as a result of a flawed process the HRA failed to identify all potential health risks. The secondary problem is that, when some health risks were identified, it was decided that these were not significant because there would be temporary, and they were therefore acceptable to the government.

But as the mere existence of this People's Inquiry demonstrates these effects were significant and were not acceptable to the people who experienced them.

What is significant and acceptable is NOT a scientific finding, it is a social experience [Attachment 3].

This raises a serious problem with relying on a risk assessment process to determine whether a pesticide should be aerially sprayed over an urban population. There is a fundamental issue of democracy here where people are involuntarily exposed to a pesticide, which causes them harm, against their expressed wishes. The problem is compounded when they are then told it is acceptable to the government, and the government even refuses compensation.

## 2. The ingredients of foray 48B

At the beginning of the WSTM programme I was asked by the then Minister of Agriculture, John Falloon, if I would reassure the public that the spray – Foray 48B was safe. My response was that I could not do that until I know exactly what was in it. The Minister informed me that he did try to get the chemical company to release that information to me on a confidential basis, even to the extent of personally guaranteeing my confidentiality, but they refused.

Numerous efforts were made during the PAM programme to have the information on the full ingredients released to the community but the Government and the chemical company refused to do so. Eventually we did discover the ingredients, with the assistance of Douglas Pharmaceuticals, when a paper released to the community under an Official Information Act request inadvertently contained sufficient information for the ingredients to be identified.

The OIA paper included the original assessment of the chemical ingredients in Foray 48B [Attachment 4]. The names of the ingredients were blanked out. However the reference to the Martindale Pharmacopoeia from which the information of the ingredient had been taken was left in, as were the pages numbers of each chemical. It was a simple matter to find the appropriate page in the manual and identify the chemical. The identification was confirmed by the fact that frequently the assessment was just lifted verbatim from the Martindale Pharmacopoeia. This paper thus also inadvertently revealed just how inadequate the assessment of these excipient ingredients had been: they in fact had not been properly assessed at all, simply paragraphs copied from a manual.

Using that information I was then able to review the literature on the ingredients and came to the conclusion that the spray could not be regarded as safe to everyone. In addition, the symptoms reported by members of the community and listed in the Blackmore Interim Report could have been caused by exposure to the mixture of chemical and biological substances that is Foray 48B.

I have attached [Attachment 5] a list of the ingredients and a very brief summary of some of the potential health effects identified from the scientific literature, including the Martindale Pharmacopoeia, particularly for propylene glycol. Further work is needed to fully establish reported effects of all the chemicals.

**3. Community Participation**

No community advisory group existed in West Auckland, until the decision had been taken to begin aerial spraying. At that point I was approached by Dr Ruth Frampton of MAF, who headed the PAM eradication programme, to represent the community of West Auckland. I responded that I could not do that as I didn't live in that community and had no mandate, but that I would assist in setting up a community advisory group. Subsequently I became a member of that group - the PAM CAG - at the invitation of the community, and later, for a period was an observer on behalf of the PAM CAG on the Technical Advisory Group – until MAF ceased to notify me of meetings.

I was deeply concerned by MAF's failure to establish a community advisory group when the moth was first found, when they were ground spraying with the highly toxic organophosphate insecticide chlorpyrifos [Attachment 6].

When they did finally establish the CAG, it rapidly became evident that MAF had no intention of working in partnership with the community, or even of paying any heed whatsoever to what the community through its CAG was advising them. For example despite many pleas to stop using Decis (deltamethrin) as a ground spray and to use the Foray 48B instead as had been successfully done in the WSTM programme – and at one stage a promise that they would – they did not. MAF's agenda appeared to be to use the CAG to tell the community what it, MAF, wanted the community told. The CAG refused to function as a conduit for MAF, as testimony from other members of the CAG will no doubt reveal, and as a result the relationship between MAF and the community became acrimonious and non-productive. [Attachment 7]

In essence the community was not permitted to engage in a constructive process with the government during the PAM programme but was sidelined and disenfranchised.

There are two issues here: whether or not the government has all the wisdom and the community has none at all, and whether the community has a right to have a say in a programme that effect their lives.

*Community wisdom:*

The essential problem was that MAF attempted to maintain sciences' cultural authority, failed to pay any respect to the community and failed to acknowledge community wisdom. Wisdom involves common sense, experience, intuition, emotion, contextual and holistic thinking, and can provide profound insight and broad foresight (Watts 2000).

MAF persisted in the view that because the CAG was 'community' it had no expertise and therefore nothing worthwhile to contribute – even though using its own definitions of expert there were several on the CAG, including Dr Peter Maddison the entomologist who original found the painted apple moth.

There is little doubt that the government did not know all that there is to know about effective painted apple moth eradication. The analysis I have provided above of the risk assessment of Foray 48B has shown that it is not the rigorously scientific method it is promoted to be. Evidence from others with expertise in entomology will show that the programme was flawed from that perspective too.

MAF failed to incorporate societal values, and to acknowledge social and economic effects of its programme. Determining the acceptability of risks is first and foremost en exercise in social discourse

Conversely, it was my experience that the community itself did have considerable expertise and wisdom that could have contributed significantly to a successful PAM programme, resulting in far less acrimony. I believe that the antagonism generated by MAF's approach to the community could have a serious adverse effect on the future success of biosecurity programme. Not the least because it has made some people very reluctant to report the findings of possibly alien insect species.

It is also my experience of many years, and working with many communities, that there is considerable expertise and wisdom in the lay community when it comes to issues involving pesticides and their effects on health and the environment, and generally also a willingness to participate in finding acceptable alternatives.

*Community's right to be involved:*

It is my view that those people who lie in the path of a government policy have a right, based on natural justice, to be directly involved in formulating and implementing that policy. Consultations, submissions and public meetings are not sufficient mechanisms for ensuring appropriate democracy. The 'scientists' only approach adopted by MAF has been shown to be socially and even scientifically flawed, and ethically inadequate. It is time for government to work with the communities that will be affected by a biosecurity programme, and the public interest groups that support them, in a partnership approach.

**4. Recommendations for future biosecurity programmes**

a) ***The precautionary principle*** should be applied to all aspects of an intended biosecurity programme.

The precautionary principle is an internationally recognised method of dealing with uncertainty when scientific knowledge is incomplete – as it obviously was with the aerially spraying of Foray 48b. The principle states that:

> *When an activity raises threats of harm to human health or the environment, precautionary measures should be taken even if some cause and effect relationships are not fully established scientifically.*
>
> Wingspread statement.

Essentially the precautionary principle directs that action be taken to reduce risk from chemicals in the face of uncertain but suggestive evidence of harm. There was suggestive evidence of harm of aerial application of Foray 48B from previous community exposures.

b) ***The principle of minimum harm*** should be applied when choosing methods to manage or control the intended species.

As a natural extension of the precautionary principle, it is sensible to choose the method or methods for managing or eradicating the intended species which are effective but which cause the minimum harm to people and the environment. This principle is more weakly expressed in the substitution principle, which requires that hazardous chemicals be replaced with safer alternatives, and in alternative assessment which requires that all alternatives to a pesticide should be considered. In applying the principle of minimum harm, one starts with the questions 'what do we want to achieve and what is the least harmful way of achieving it', rather than simply establishing whether or not aerial spraying poses no unacceptable risk to health (Watts 2000, Chapt 5).

***c) Right to know:*** if a pesticide of any sort is to be used in a biosecurity programme, the community must be provided with the full ingredient list of that pesticide and information on all known potential adverse effects.

It is a fundamental tenet of natural justice that when people are to be exposed to a substance they be given full information on the constituents, so that they can themselves determine what is acceptable to them.

***d) Community involvement:*** inclusive and democratic

The community implicated in an intended biosecurity programme should be fully involved in that programme from its inception, in a meaningful way and based on a partnership approach. This includes:

- recognition of lay expertise and wisdom within the community and its public interest groups;
- recognition of anecdotal evidence of health effects experienced by the community;
- recognition of social impacts;
- participation of community-selected representatives on all scientific and policy groups and processes;
- community advisory groups formed with the intention of meaningful two-way dialogue;
- inclusion of community views in all policy decisions.

***e) The Biosecurity Act*** should be amended to incorporate these four recommendations.

References:

Kalemba K, Hope V, Sinclair D. 2002. Health Risk Assessment of the 2002 Aerial Spray Eradication Programme for the Painted Apple Moth in some Western Suburbs of Auckland. A Report to the Ministry of Agriculture and Forestry by the Public Health Service, Auckland District Health Board. March 2002.

Kelly F. 2001. Foray 48B Spraying in West Auckland (The Painted Apple Moth Eradication Programme). Public Health Protection Office, Auckland District Health Board. 21st December 2001.

Kelly F. 2002. Painted Apple Moth Project Health Team Up and Running, Media Release. 14 January 2002.

Sutton J. 2002a. Painted Apple Moth. Media Statement. Hon Jim Sutton, Minister for Biosecurity. Wellington, 3 July 2002.

Sutton J. 2002b. All New Zealanders need to work together for effective biosecurity. Media Statement. Hon Jim Sutton, Minister for Biosecurity. Wellington, December 17, 2002.

Watts MA. 2000. Ethical Pesticide Policy: Beyond Risk Assessment. PhD thesis, University of Auckland, Auckland.

Whalan JE, Pettigrew HM. 1998. [Inhalation risk characterizations and the aggregate risk index]. Draft memorandum to M. Stasikowski, Director, Health Effects Division. US EPA.

Wingspread Conference on the Precautionary Principle. January 26, 1998. http://www.sehn.org/wing.html

==========

**Meriel Watts – 75**
**Attachment 1**

Extract from: *Watts, MA 2000. Ethical Pesticide Policy: Beyond Risk Assessment. University of Auckland.*

### 3.5.2 Selection of data inputs and risk models

The selection of data inputs and mathematical risk models tends to excite less concern than does the extrapolation of the resulting test data to potential human experience. In part, this is because there is perceived to be a greater degree of scientific precision in this fundamental part of the process. That may be so, yet it is also riddled with choices and judgements and hence open to bias from assumptions based on underlying and implicit value systems.

***Data inputs***

The US EPA (1990, p.20) reported that the National Academy of Sciences has estimated there to be "at least 25 components—of both a scientific and *policy* nature—in complete hazard identification" [emphasis added].[1] Wherever policy decisions are required, the dominant values of the scientists involved, or their employers, influence that decision. Even when the same fundamental approach is taken to risk assessment, differences in scientific judgement and interpretation of data were found by the Risk Assessment Advisory Committee of the California EPA to result in substantial differences in risk estimates between Cal/EPA and the US EPA (Cal/EPA 1996).

Krieger and Ross (1993) referred to the need to "decide which effect and what level of severity will be treated as a 'response'" (p.567). With respect to the first of those two decision elements, de Raat *et al.* (1997,

[1] US EPA cited NAS 1983.

p.204) noted that "it is an illusion to think that all possible adverse effects can be detected with any practically and economically feasible toxicological data set" (p.204). With respect to the second decision, the US EPA (1990) noted the problem of "arriving at a judgement as to what the response means" (p.23), and asked the question "what is truly a valid indication of an untoward health effect?" (p.25). The decision to treat an effect as an adverse effect in part depends on statistical significance and knowledge of chemical structure and activity relationships, according to Krieger and Ross (1993, p.567).[2] It can be surmised from that, that a response other than those expected from a particular chemical structure may well be disregarded. Lewis *et al*. (1998, p.635) pointed out that the decision to determine whether or not a chemical is a carcinogen, in part depends on the site in which a tumour has occurred in trials: unusual or rare cancer sites tend to be given less weight than those that occur, for example, in the liver or kidney.

Such a judgement of expected effects from particular chemical structures also underlies the decision on whether or not to require a particular toxicity test in the first place. Commonly, this occurs with neurotoxicity tests as previously indicated. In deciding against a neurotoxicity test for a pesticide, on the basis of the structure of that chemical and its relationship to chemical groups not recognised as causing adverse neurotoxic effects, the door is closed against previously unrecognised chemical-effect relationships.

Even if the regulator decides that a neurotoxicity test is required, which one should it be? Fan, Howd and Davis (1995) asserted that "dozens of procedures to anaylze various nervous system functions have been developed over the last few decades to evaluate both acute and chronic effects of chemicals, but no comprehensive test battery has emerged as a standard" (p.347).

Quantification of dose-response relationships requires both a quantifiable method of measuring toxicity and a precise means of expressing it. There is a great variety of end points of toxicity that could be used. A mechanistic, molecular criterion is regarded as ideal by Klaassen and Eaton (1991), but usually not available. Instead, a measure of toxicity that is "unequivocal and clearly relevant" (p.19) is selected—such as the inhibition of cholinesterase by organophosphate insecticides. Klaassen and Eaton (1991) noted that "although many end points may be quantitative and precise, they are often indirect measures of toxicity" (p.19). This may result in the overlooking of other toxic effects that can be of greater significance but are less amenable to the requirements of the dose-response quantification model.

The selection of cholinesterase inhibition as a criterion illustrates this point well: the inhibition of cholinesterase by some organophosphates may not be directly related to the main toxic effect of delayed neuropathy, according to Timbrell (1991, p.8). Symptoms of cholinesterase inhibition usually occur within a few minutes and may last several days. They commonly include tightness of the chest, wheezing, bradycardia, constriction of the pupil, salivation, lacrimation, sweating, nausea, vomiting, diarrhoea, fatigue, involuntary twitching, muscular weakness, hypertension, hyperglycaemia, tension, anxiety, ataxia, convulsions, coma, and in extreme cases death by respiratory failure. The effects of delayed neuropathy, however, which may not be manifested for ten to fourteen days, involve degeneration of peripheral nerves in

[2] Krieger & Ross (1993) stated that government agencies provide guidelines for determining adverse effects and that this process utilises "well-tested methodology that is used virtually universally" (p.567).

the distal parts of the lower limbs, possibly spreading to upper limbs. The effects of the cholinesterase inhibition can be alleviated by treatment, but those of the neuropathy cannot (Timbrell 1991, p.327-30). Additionally, Rosenstock, Keifer, Daniell, McConnell and Claypoole (1991) found that a persistent decrease in neuropsychological performance followed acute poisoning by organophosphates, long after the acute symptoms had disappeared, and not related to cholinesterase levels.[3] More recently, Ahmed and Davies (1997) proposed the existence of a neuropsychiatric syndrome resulting from chronic exposure to organophosphates.[4] The symptoms include muscular aches and pains, influenza-like symptoms, personality change with affective destabilization, impulsive suicidal ideation, impairment of concentration and memory, language disorder, reduced tolerance to alcohol, heightened sense of smell, heightened sensitivity to organophosphates, deterioration of handwriting, and impaired tolerance of exercise. Therefore, the simplistic use of cholinesterase levels as a method of quantifying the effects of organophosphates would appear to be an inaccurate reflection of the true level of effects.

There are further implications for this in the NOEL relationship. Timbrell (1991, p.15) put the view that, where the toxicological reaction to a pesticide is a reversible reaction, a threshold may exist below which repeated or continuous low-dose exposure will have no measurable effect. However, where the reaction is irreversible, not only can a single exposure be sufficient to cause damage, but also repeated low level exposure can have a cumulative effect resulting in eventual toxicity. Timbrell (1991, p.15) again used the example of organophosphates to illustrate this problem. Organophosphate inhibition of cholinesterase enzymes can be irreversible and toxicity becomes apparent after about 50 percent inhibition has been achieved: if the cumulative effect outstrips the resynthesis of the enzymes toxicity occurs regardless of the size of the last-straw dose.

It is important to add that, although cholinesterase reactions may be used to quantify dose-response relationships, they may not be the sole data input for determining the toxicity of organophosphates. A variety of neurotoxicity tests may be used to determine the effect on the nervous system (NRC 1993, p.152). However, it appears these may be inadequate to accurately portray the effects of these pesticides on children. Recent papers have drawn attention to children's relatively greater vulnerability to these pesticides, compared with adults (e.g. Eskenazi, Bradman & Castorine 1999; Landrigan, Claudio, Markowitz, Berkowitz, Brenner, Romero, Wetmur, Matte, Gore, Godbold & Wolff 1999). That vulnerability stems from a lesser ability to detoxify chemicals,[5] and from the immaturity of neurological and immune systems, the development of which is easily disrupted, according to Landrigan *et al.* (1999, p.434).[6] Low dose exposure to organophosphates during the critical period of brain development may result in long-term neurochemical

[3] Linda Rosenstock, Matthew Keifer and William Daniell, Occupational Medicine Program, University of Washington; Robert McConnell, Division of Occupational and Environmental Health, Mount Sinai School of Medicine; Keith Claypoole, Department of Psychiatry and Behavioural Sciences, University of Washington.

[4] Ahmed and Davies, Rydon House Acute Unit, Taunton, Somerset.

[5] Landrigan *et al*. 1999 (p.434) cited Bearer 1995; Mortensen, Chanda, Hooper & Padilla 1996.

[6] Philip Landrigan, Luz Claudio, Steven Markowitz, Gertrud Berkowitz, Barbara Brenner, Harry Romero, James Godbold, Mary Wolff, Mount Sinai School of Medicine, New York; James Wetmur, Centre for Biology of Natural Systems, City University of New York; Thomas Matte, Center for Urban Epidemiologic Studies of the New York Academy of Medicine; Andrea Gore, Borikuen Neighbourhood Health Center, New York.

deficits and behavioural abnormalities, according to a number of studies reported by Landrigan *et al.* (1999) and Eskenazi *et al.* (1999). Landrigan *et al.* (1999, p.435) also reported that new US EPA guidelines designed to detect the effects of pesticides on children fail in this area because they do not test for functional effects of organophosphates on the nervous system, nor do they follow through from early exposure to establish the risk of development of neurological problems such as dementia, Parkinson's disease or amotropic lateral sclerosis later in life (Landrigan *et al.* 1999, p.434-5). The importance of functional effects will be referred to again, in Chapter 4, in the discussion on low dose exposure to mixtures of chemicals.

One last aspect of data input that deserves scrutiny is the method used to obtain that data. Considerable doubts exist about the veracity of data obtained from various methods used to determine carcinogenicity. Long-term rodent trials have been the traditional test for carcinogenicity but, partly because of the escalating cost of these trials and partly because of doubts about applicability to humans, the Ames test for bacterial mutagenicity is increasingly used as a guide to the genotoxic nature of a particular chemical. Unfortunately, the concordance between this test and the rodent bioassay averages about 55 percent, and in one study was less than 40 percent, according to Lewis *et al*. (1998, p.636).[7] Nevertheless, the authors stated this test has been generally adopted because of its low cost and straight-forwardness. Computer generated results of carcinogenicity tests, based on quantitative structure-activity relationship studies, are also a problem. They can, according to Lewis *et al*. (1998) be misleading in terms of overinterpretation of inadequate or insufficient data in certain circumstances. Lewis *et al*. (1998) commented that "the normally wide variation and margins of error in the biological data are usually disregarded in the search for apparently highly significant correlations" (p.637). Other authors also stressed that biological activity data is often overlooked because of the focus on structural descriptors and statistical significance.[8]

==========

[7] Lewis *et al*. cited Bogen 1995.

[8] Lewis *et al*. cited Benigni & Giuliani 1994; Benigni & Richard 1996.

**Meriel Watts – 75**
**Attachment 2**
Memorandum: *Meriel Watts. January 2003. Painted Apple Moth Eradication Programme – Health Risk and Effects*
See www.peoplesinquiry.co.nz Community Studies.

==========

**Meriel Watts – 75**
**Attachment 3**
Extract from: *Watts MA. 2000. Ethical Pesticide Policy: Beyond Risk Assessment. University of Auckland*

**3.7 The socialising of risk: acceptable to whom?**

> A thing is safe if its risks are judged to be acceptable.
>
> Lowrance 1976, p.8.

> Acceptable levels in this sense are the retreat lines of a civilization supplying itself in surplus with pollutants and toxic substances. The really rather obvious demand for non-poisoning is rejected as *utopian*. At the same time, the bit of poisoning being set down becomes *normality*. It disappears behind acceptable values. Acceptable values make possible a *permanent ration of collective standardized poisoning*.
>
> Beck 1992, p.65.

Risk assessment assumes a permissible level of poisoning, in Beck's words. The decision about what that level is, i.e. whether or not a risk is acceptable, traditionally lies outside the risk assessment process, forming part of the wider 'risk management' process. Determining acceptability is regarded as a political decision, a value-based decision, and hence is separated from the 'purely scientific' process of risk assessment. Thus, it does not theoretically form part of this chapter, but brief mention will be made of it here because the notion that risk assessment is purely scientific has been rejected, hence the separation is regarded as a false one. Additionally, lay assessment of risks quite obviously includes deciding whether or not the risks are acceptable. And it is frequently the technical experts who make the decisions about acceptability. For example ERMA, which has no representatives of the community or of societal values, will alone make the decision on whether or not risks from pesticides are acceptable.

There are two general approaches: the delineation of a particular level of risk as acceptable, and/or the acceptance of risks if they are outweighed by the economic benefits attendant upon them (Guillebeau 1994; Barnard 1996). In these processes political decisions are taken for society to accept a certain level of risk from exposure to pesticides, in exchange for a perceived higher level of benefit usually regarded as being economic benefit (e.g. Barnard 1996).

The concept of acceptable risk would appear to arise from the very old common law principal of *de minimus*, in which the law need not concern itself with trivial harms (Margolis 1996, p.147). The US EPA uses '1 in a million' as the standard for the acceptable risk of developing 'excess' cancer, i.e. those over and above the background level of cancer than can be expected from other causes. The U.S. Supreme Court reputedly concluded that a 1 in a billion risk of cancer "clearly could not be considered significant", but that "a reasonable person might well consider" a one in a thousand risk to be significant—hence, in

between, 1 in a million. Roy Albert (1994) reported that the EPA standard for acceptable risk of cancer was developed during "a hallway conversation", not on the basis of rigorous scientific analysis, but rather on the basis of what the public accepts as the risk of getting killed in a mass transportation accident and because it has "a nice ring" to it. As Shrader-Frechette (1991, p.71-72) pointed out, the *de minimus* approach relates to the average person not the individual person, whereas most civil rights are based on the individual person's needs. It means that the elderly, children, persons with previous exposure to carcinogens, those with allergies, etc, face risks higher than those that are deemed acceptable on the basis of averages, without of course giving their consent.

Increasingly common, however, is the risk-benefit approach to determining acceptability of risks, which has been enshrined in some recent legislation such as New Zealand's HSNO Act 1995, and the USA's Safe Drinking Water Act Amendments 1996. Essentially, if the assessed benefit outweighs the assessed risk and cost, then the pesticide will be registered. The HSNO regime has two riders to this: if the risks are regarded as being unacceptable regardless of benefit the registration is declined, or if they are regarded as being negligible then benefits do not have to be proven (ERMA 1998, p.20). A similar approach is taken by the US EPA (Guillebeau 1994, p.175).

The major issue is who determines what is acceptable? It is usually the regulators, the technical experts, making decisions on behalf of society. But if the decisions are made by those with technical expertise and a technological rationality, how can they be expected to reflect the degree to which the risk may be acceptable to the wider public operating on a basis of social rationality? Brunk *et al.* (1998, p.116,134-136) drew attention to the narrow, instrumental conception of rationality applied by the Canadian Review Board in the Alachlor case, in which the adjudging of risks and benefits assumed, without question, the need for chemicals in agriculture and therefore excluded any consideration of the benefits of not using herbicides, which would obviate the need for any risks at all. Sweden is one of the very few countries that do include the ethic of alternatives in their risk analysis processes, as will be discussed in Chapter 5. In a similar vein, Wildavsky (1988, p.49-50) defended the acceptability of imposing some 'small' risks in order to reduce overall larger risks. He illustrated this hypothesis with an account of the number of lives lost to a particular drug versus the larger number of lives saved by that drug. In so doing he ignored the possibility of alternatives to that drug. What if no lives at all need be lost, by not using the drug and instead using another management approach? The availability of alternatives is an important issue in discussing the acceptability of risks from pesticides: what if there are less hazardous methods of achieving the same pest control outcome? What does this do to the level of acceptability of risk? In the majority of the pesticide regulatory systems around the world, risks from pesticides are adjudged in a vacuum through failure to provide risk comparisons with other effective management options, such as organic or biodynamic growing systems, or less hazardous pesticides. Yet the public intuitively makes such comparisons and hence, frequently, the risks acceptable to the public are lower than those narrowly adjudged by the authorities.

There are a whole raft of social justice issues that are bound up in the decisions about the acceptability of risks. They include informed consent, the effects on those who are not average, and distributive justice.

They will not be further discussed here for they have all been well traversed in other literature (e.g. Shrader-Frechette 1991). It will simply be noted that the acceptability of risk is not simply a question of economic and technical rationalisation: it is a question of social justice, and as such must be made in a manner that incorporates the views of wider society.

**Conclusion**

In conclusion, this chapter has demonstrated that risk, as assessed by technical experts, is not a fact. Nor is hazard a fact. "What is the sound of one fact speaking?" asked Professor William Freudenburg (1996, p.12) at a symposium on environmental risk decision-making. Perhaps one answer might be: risk assessment of pesticides. What Freudenburg was referring to is the 'fact' that all facts must be interpreted in order to be used: a fact does not self-interpret, and the interpretation of facts involves the value systems of the person interpreting them. However, as has been demonstrated, a more literal interpretation of Freudenburg's question may be applied to risk assessment in which the only fact is the effect of particular dose rates on particular laboratory animals, under particular conditions. That singular set of facts is bounded by discretionary judgements, or inference options, up to fifty of which may occur in a normal risk assessment process, according to Mayo (1991, p.257).[9]

As has been shown, those judgements involve value systems, and it is contended that failure to acknowledge these and their influence undermines the claim to objective rationality:

> Determinations of risk oddly straddle the distinction between objective and value dimensions. They do not assert moral standards openly, but in the form of a *quantitative, theoretical and causal implicit morality*. Correspondingly, in the investigation of risks with a generally conventional understanding of science, a kind of 'objectified causal morality' is being undertaken.
>
> Beck 1992, p.176.

Risk assessment of pesticides is an essentially political process. It is "'science' only in an attenuated sense", according to Brunk *et al.* (1998) "notwithstanding the fact that it is typically carried out by scientists, including highly qualified ones" (p.3). Nevertheless, it is presented to policy makers and to the public as a scientific process.

The analysis in this chapter has demonstrated that the risk assessment of pesticides is not an exercise in what the 'naïve positivist' regards as scientific objectivity, but that it is a scientific exercise imbued with subjectivity arising from a lack of data and the vagaries of human reality. It is not the intention to use this analysis as a confirmation of the view of social reductionists, that risk is a social construct, and therefore does not exist in fact. Risks are real in that they exist, but the magnitude or acceptability of those risks cannot be determined as factual: they can only be estimated, assessed or perceived. The method used to assess those risks does not make them real or factual, it simply makes them assessed by a particular methodology, be it scientific, cultural, social, etc. Shrader-Frechette (1991) referred to all risk assessments as "risk perceptions". Whether the outcomes of the lay and technical assessment processes be titled risk

[9] Mayo cited NAS 1983.

perception or risk assessment is immaterial, but the attribution of one term to one group of people and the other to the second group cannot be justified. Fischhoff *et al.* noted the fallibility of expert judgement as a result of judgement biases, particularly where assessment of risks requires the expert to:

> . . . go beyond the limits of available data and convert their incomplete knowledge into judgements useable by risk assessors. In doing so they fall back on intuitive processes much like those of lay people.
>
> Fischhoff *et al.* 1981, p.33.

They offered some "anecdotal evidence" that experts display the same degree of "insensitivity to the tenuousness of the assumptions upon which beliefs are based" (p.35) as does the lay person. In other words, like the lay person, the expert may be overconfident in the "quality of their own judgement" (p.35). Such appears to be the case with the following comment from three authors, two of whom worked for the Department of Pesticide Regulation of the California Environmental Protection Agency:

> Possible acute effects of chemicals have been effectively regulated by health professionals including toxicologists during the past 50yr.
>
> Krieger, Ross & Thongsinthusak 1992, p.5.

This is an astonishing comment given the information available on acute poisonings from pesticides, and is given the lie by recent US moves to curb use of organophosphate insecticides because of the risks they pose to health. Some of these risks relate to potential acute effects on children from their consumption of food containing organophosphate residues, as mentioned earlier (Reeve 1999, p.1). Yet those same authors, just one year before the National Research Council (NRC 1993) report that drew attention to this problem, passed the judgement that levels of residues in food and water are so low that they should not be called residues at all, but rather "be regarded as part of our chemical environment" (Krieger *et al*. 1992, p.3). It was two of these authors, Krieger and Ross (1993), who also likened exposure to pesticides as akin to the "aromas of morning coffee, freshly baked bread and newly mown hay" (p.569), as reported earlier in this chapter. These attempts to confer an unwarranted and erroneous degree of naturalness upon pesticide residues in food, air and water would appear to stem from a belief in the benignity and beneficence of chemical technology rather than from scientific *fact*.

The current elevation of risk analysis and risk assessment to a status of technological elitism effectively removes it from the ambit of the lay person, and hence accords it a protection from public scrutiny of the uncertainties involved, and of the value systems that underpin the consequent judgements and assumptions. The crucial concern for the public, and hence pesticide policy, is whether or not these values accurately reflect those of society as a whole. Public scrutiny of the process might well result in rejection of the whole model because of an inability to accurately reflect society's need. Where technocratic decision-making is afforded political legitimacy and the lay/societal view is discredited as false perceptions, democracy suffers. In policy terms, the results of risk assessment are often presented in a manner that infers that the risks a substance poses to humans and the environment are negligible, acceptable or tolerable. Such an approach assumes that society has defined the risks in the same way as has the assessor. However, this is very obviously often not the case. Such an approach also assumes that toxicology accurately measures all hazards

pesticides may pose. On the basis of the factors of uncertainty, assumed to overestimate hazard, the effects of a pesticide as estimated by a regulatory model are assumed to be worse that any likely occurrence in real life (Margolis 1996, p.160). Thus, if a pesticide clears the regulatory risk assessment process, the assumption is that it is very unlikely to cause harm in real life, barring some accident or gross misuse. In practice, however, that 'unlikely' becomes a 'cannot' because the benefit of the doubt is given to the regulatory model and the scientifically derived risk, rather than to actual human experience. Evidence was presented in this chapter about the recent uncovering of the endocrine disrupting effects of some pesticides, not previously addressed by regulatory toxicology. The next chapter will provide evidence of other areas in which it fails to take into account hazards to human health.

**References [not included here]**

==========

**Meriel Watts – 75**
**Attachment 4**
*Toxicological Assessment of Foray 48B. August 1996.*

## TOXICOLOGICAL ASSESSMENT OF THE INERT INGREDIENTS OF FORAY 48B

This document was obtained from the Ministry of Health under an OIA request in 2002 by members of the PAM Community Network. The ingredients of the formulation and personal names had been blacked out. However references had not been deleted, and with the assistance of a pharmaceutical company, the information that remained was sufficient to satisfactorily identify the ingredients.

The *Assessment* was done for the White Spotted Tussock Moth aerial spraying in 1996/1997. The same spray was used for the PAM programme in West Auckland until February 2003 when a new Foray 48B formulation was substituted.

In this full transcription of the original document, blacked out portions are denoted by **xxxxx** with the 'identified' ingredient name inserted in italic at the head of the paragraph

See www.peoplesinquiry.co.nz Report – Appendix 4 -
http://www.peoplesinquiry.co.nz/images/Documents/appendix%204%20-%20ingredients%20of%20foray%2048b_60.pdf

==========

**Meriel Watts – 75**
**Attachment 5**
Meriel Watts, PhD: *Brief Summary of some information about adverse health effects of Foray 48B*

## FORAY 48B Inerts: Brief Summary
**Meriel Watts, PhD**

**Constituents of Foray 48B as used in West Auckland before Feb 2003.**

Btk – organism, spores, endotoxin, enterotoxin?

Fermentation solids
Water
Methyl paraben (methyl hydroxybenzoate)
Benzoic acid/sodium benzoate
Propylene glycol
Potassium sorbate
Sorbitol
Hydrochloric acid.
Polyacrylic acid

**Brief summary of some information about adverse health effects**

- ***Methyl paraben (methyl hydroxybenzoate)***

- well-known sensitiser – causing allergic reactions, especially to skin
- irritating to eyes, skin, respiratory system, gastrointestinal system
- individuals already sensitised to this chemicals will react to minute amounts
- propylene glycol increases the activity of this chemical

*Sources: Martindale, Douglas Manufacturing*

- ***Propylene glycol***

- irritation to skin, eyes and mucous membranes
- aggravation of kidney disorders
- some evidence of liver damage in laboratory tests
- damage to intestines
- reproductive effects
- effects on red blood cells: decrease their life span; also other blood effects (increased osmotic pressure)
- nodules in spleen
- has been associated with deafness - Martindale recommends that it is not used in ear drops
- depression of central nervous system, especially in children:
  - reports of seizures in children taking multivitamin formulations containing propylene glycol
  - CNS depression causing mortality has been described in premature infants after repeated exposure to medication containing propylene glycol; CNS effects have also been observed in children dermally exposed to propylene glycol
  - a case of propylene glycol intoxication in a premature infant is reported. The infant went into a state of coma after treatment for burns with antiseptic dressings. Cessation of the topical treatment resulted in complete recovery. An exceptionally high level of the dressings' solvent, propylene glycol, found in the urinary chromatogram, was believed to be the causative agent. It is suggested that topical preparations containing propylene glycol should not be used in premature infants- during the first weeks of life
  - the case of a 2-yr-old boy who developed a marked metabolic acidosis and CNS depression as manifestations of serious propylene glycol **(**PG) poisoning following an accidental ingestion of an estimated 3 ounces of hair gel that contained 1.75-2.25% PG is reported. The child experienced 3 to 5 episodes of spontaneous vomiting shortly after being discovered

- polyethylene glycol esters and diesters can enhance the skin penetration, and the effect, of other chemicals, particularly steroids, by interacting with the lipid bilayers.

- very little inhalation data available, but it appears that it may be more toxic by inhalation than oral ingestion.
- propylene glycol is absorbed completely from the gastrointestinal tract and partly via the skin and the lungs.

*Sources: Ministry of Health Toxicological Assessment of Foray 48B, Martindale Pharmacopoeia 31st Edition*

*Further reports from recent medical literature:*

Wilson et al (2005) report that propylene glycol toxicity is increasingly recognized and reported as a potentially life-threatening iatrogenic complication of IV psychiatric drugs (in which it is used as a solvent). Effects include metabolic acidosis, hyperosmolarity, and clinical deterioration. [Wilson KC, Reardon C, Theodore AC, Farber HW. 2005. Propylene glycol toxicity: a severe iatrogenic illness in ICU patients receiving IV benzodiazepines: a case series and prospective, observational pilot study. Chest. 2005 Sep;128(3):1674-81.]

Neale et al (2005) report the death of a 24 year-old female from severe propylene glycol-induced lactic acidosis following IV administration of lorazepam (solution containing propylene glycol) for severe acute respiratory distress syndrome. [Neale BW, Mesler EL, Young M, Rebuck JA, Weise WJ. 2005. Propylene glycol-induced lactic acidosis in a patient with normal renal function: a proposed mechanism and monitoring recommendations. Ann Pharmacother. Oct;39(10):1732-6.]

Horiguchi et al (2005) report severe contact dermatitis from propylene glycol in an ultrasonic gel - the regional skin showed redness and hardness with pustules. Histologically, there was epidermal and appendage necrosis, as well as exocytosis of red blood cells, with a diagnosis of skin injury due to leakage of lipidol ultrafluid. After treatment the leakage skin injury improved significantly, leaving pigmentation, hardness, and a small necrotic mass. [Horiguchi Y, Honda T, Fujii S, Matsushima S, Osaki Y. 2005. A case of allergic contact dermatitis from propylene glycol in an ultrasonic gel, sensitized at a leakage skin injury due to transcatheter arterial chemoembolization for hepatocellular carcinoma. Int J Dermatol Aug;44(8):681-3.]

deRoux et al (2005) identified 3 cases where propylene glycol, either alone or in combination with other chemical agents, contributed to death. One case in whom propylene glycol was the sole agent was a 32-year-old schizophrenic man with cardiomegaly and renal impairment. The blood PG concentration was 4410 mg/L at least 9.5 h following ingestion. [deRoux SJ, Marker E, Stajic M. 2005. Fatalities by ingestion of propylene glycol. J Forensic Sci. Jul;50(4):939-41.]

Lemazurier et al 2005, in 3–generational studies on rat found a decrease in testicular and epididymal sperm counts in relation to propylene glycol monomethyl ether isomer in acute daily exposure, on the first parental generation. [Lemazurier E, Lecomte A, Robidel F, Bois FY. 2005. Propylene glycol monomethyl ether. A three-generation study of isomer beta effects on reproductive and developmental parameters in rats. Toxicol Ind Health 21(1-2):33-40.]

- **Benzoic acid/sodium benzoate**

- anaphylactic reactions
- asthma, urticaria, rhinitis
- irritant to skin and eyes – contact urticaria
- diarrhoea, vomiting, muscle weakness, tremors, emaciation, degeneration of the liver.
- risk of metabolic acidosis in premature infants
- toxicological data and risk assessment assumes ingestion, but studies indicate that there is no safe level for inhalation of this chemical.

*Sources: Ministry of Health Toxicological Assessment of Foray 48B, Martindale.*

- **Polyacrylic acid**

- can cause contact dermatitis
- irritant to people with pre-existing skin and respiratory problems (
- releases calcium ions in the gastro-intestinal tract and should be avoided by people who must restrict calcium intakes
- used as laxative

*Sources: Martindale, Douglas Manufacturing.*

- **Sorbitol**

- Irritant to eyes, respiratory system and skin.
- Flatulence, abdominal pain, diarrhoea.
- colonic necrosis in a renal transplant patient
- septacaemia following ischaemic bowel wall caused by bacterial metabolism of sorbitol

*Sources: Ministry of Health Toxicological Assessment of Foray 48B, Martindale, Douglas Manufacturing.*

- **Potassium sorbate**

- Irritant to eyes, respiratory system and skin
- Hypersensitivity can occur.

*Sources: Douglas Manufacturing.*

==========

**Meriel Watts – 75**
**Attachment 6**
Transcribed article: *MAF's Toxic Spraying in Auckland,* published in *Soil & Health* Jan/Feb 2000. *M. Watts.*

## MAF'S TOXIC SPRAYING In Auckland

Throughout the latter half of 1999, MAF conducted an intermittent spray campaign against the painted apple moth. This insect invader was found first in Glendene in West Auckland, then to the east in Mt Wellington, and then again back in Glendene. There are remarkable differences between the way MAF conducted this campaign and the way they conducted a previous insect eradication programme, that of the tussock moth. These differences raise alarm bells about the behaviour of this government department.

The two biggest problems are MAF's failure to involve the public, including public interest groups such as Soil & Health, in the process, and their reversion to the use of toxic chemicals in urban areas.

Firstly the failure to involve the public. MAF, under the guidance of former minister John Falloon, went to considerable lengths to communicate with the people who lived in the tussock moth infested area, and with NGO groups who work on behalf of the public on pesticide issues. This enabled us to head off any suggestions of resorting unnecessarily to synthetic chemicals, a stratagem that was vindicated by the subsequent complete eradication of the pest without chemicals. Such involvement of public interest groups in the process should have acted as a model for other government agents and particularly for MAF itself. But, apparently, MAF has already forgotten the lessons learned.

The second problem probably explains the first. Despite the outstanding success of the organics spray, Btk, in the tussock moth control programme, MAF reverted to the use of toxic chemicals. Btk achieved complete

eradication of the tussock moth, something very difficult to achieve even with the most toxic chemicals. Yet MAF chose the chemicals next time. No consultation, just an authoritarian decision. Not only did they choose to use two toxic chemicals, but one of them is under a gathering cloud in the USA.

**The dangers of chlorpyrifos**

The chemical of concern is the organophosphate insecticide, chlorpyrifos, marketed as Dursban or Lorsban. In a recent review of chlorpyrifos, the US Environmental Protection Agency (EPA) found that exposure to chlorpyrifos on the skin, in food, or by inhaling could be harmful to human health. It can cause blurred vision, muscle weakness, headaches and problems with memory, depression and irritability. (1)

The greatest problem with exposure to chlorpyrifos occurs with pregnant women and small children. Chlorpyrifos is a neurotoxicant with evidence of developmental neurotoxicity in both animals and humans; there are also reports of neurophysiological effects in humans according to the US EPA. Animal tests show that even low does exposure to this chemical can seriously affect the foetus, interfering with brain development and causing long-term neurochemical and behavioural deficits in offspring. Newborn children are at a greater risk than adults because of a lesser ability to detoxify this chemical. Chlorpyrifos causes significant inhibition of plasma and red blood cells in animals. (1,2,3,4).

Multiple chemical sensitivity researchers point to chlorpyrifos as one of the major causes of the onset of this syndrome, at least in the USA. Its involvement stems from the damage it does to the neurological system.(4).

Chlorpyrifos causes environmental problems too; unlike Btk it is a broad spectrum insecticide, and kills all insects, not just moths and butterflies. Most insects are not pests but valuable members of the ecosystem. It is reported to be very highly toxic to fish and estuarine and marine organisms, and is also toxic to birds. Cats are very sensitive to chlorpyrifos, in particular being susceptible to delayed neuropathy. Earthworms too are susceptible to chlorpyrifos poisoning, especially the species *Lumbricus rubellus*(3)

**Government action?**

The US EPA review of chlorpyrifos is part of its overhaul of pesticide registration because of a new law that requires extra protection for children. This is in recognition of the vulnerability of children's developing nervous, immune and endocrine systems to pesticides. The New Zealand government has not yet recognised children's greater vulnerability to pesticides and so probably will do nothing about the American findings. When last the US EPA found two organophosphates to be of concern, namely methyl parathion and azinphos methyl, they lowered the level allowable in food by a factor of ten. The NZ government's response was to do nothing, on the grounds that there was no scientific evidence that they needed to. In other words, the benefit of uncertainty was given to the chemical not to children. No doubt this will be MAF's response yet again, since it is MAF that registers the pesticides it uses in its own spray programmes. If only MAF would use the same rationale on its other activities, for there was no scientific evidence that it needed to use a toxic chemical to eradicate painted apple moth.

As we move towards our target of New Zealand being organic by 2020, a target we expect to be supported by the new government, it is quite evident that MAF needs to readdress its pest control and public participation methods. It has already proven it can do it the organic way. Now all it needs is confidence in its own success with organics, together with public input to assist it achieve its goals.

References.

1. USEPA. 199. chlorpyrifos: HED Preliminary Risk Assessment for Reregistration Eligibility Decision (RED) document, October 18,1999.
2. US EPA. 1998 hazard Assessment of the Organophosphates. Report of the Hazard Identification Assessment Review Committee, July 7,1998.
3. landrigan, P.J, Claudio, L., Markowitz, S.B., Berkowitz, G.S., Brenner, B.L., Romero, H., Wetmur, J.G., Matte, T.D., Gore, A.C., Godbold, J.H., Wolff, M. 1999. Pesticides and inner-city children: exposures, risks and prevention, *Environmental Health Perspectives* 107(S3): 431-437.
4. Ashford, N., Miller, C. 1998 *Chemical Exposures: Low Levels and High Stakes,* Second Edition. Van Nostrand Reinhold, New York.

5. Cox, C. 1995. chlorpyrifos, part 3: *Ecological effects, Journal of Pesticide Reform.* 15(2): 13-19.

==========

**Meriel Watts – 75**
**Attachment 7**
Transcription of Pesticide Report by Dr Meriel Watts, printed in *Organics NZ Jan/Feb 2000*

## MAF bungles the biosecurity in West Auckland

**The Painted Apple Moth (PAM) eradication programme is a fiasco, and we think a public inquiry should be held. Here are some of the things it might reveal.**

PAM *(Teia anartoides)* is an Australian that appears to have hitckhiked across the Tasman Sea on a container. It was identified by entomologist Peter Maddison in April 1999 in Glendene, West Auckland. Then it turned up on the other side of Auckland, in Mt Wellington.

The MAF machine swung into action and began low-key, but chemical intensive eradication programme. Despite, or because of this, PAM is still with us in West Auckland two years later. Even worse, the latest data from MAF's moth trapping programme indicates that PAM has spread well beyond its original site of infestation and is now to be found in the ecologically significant Waitakere Ranges.

Rumour has it that some native trees, as well as apples and other fruit, are favoured food for PAM, but we have not seen any data from feeding trials that verify this. PAM is not a severe problem in Australia, probably because it exists in some sort of ecological balance with predators, parasites and diseases, and it gets sprayed with insecticides in orchards. It could however pose problems for our organic orchards, as well as for our native ecology.

Why has it all gone so badly wrong? Two fundamental reasons: MAF refused to learn the lessons from the successful eradication of the White-spotted Tussock Moth (WSTM) in East Auckland; and MAF resorted to chemical pesticides instead of the soil bacterium *Bacillus thuringiensis* kurstaki Btk).

There were politics involved in these decisions. MAF gave the job of PAM extermination to Dr Ruth Frampton. She 'failed' to involve any members of the WSTM team – including Dr John Clearwater whose international colleagues successfully identified and synthesised the female sex attractant (pheromone) that was so crucial to the WSTM success. The pheromone is used in traps to catch male moths and so delineate the area of infestation. Instead, Framptom gave the pheromone contract to HortResearch who, two years later, have still not come up with the crucial pheromone product. Finally, after political pressure, Clearwater's team was recently provided with the material to identify the pheromone and has quickly achieved success.

Meanwhile MAF people, having rejected the highly effective and relatively 'safe' Btk, were spraying infestations of PAM with chlorpyrifos. Chlorpyrifos is a toxic organophosphate insecticide that has been severely restricted in the US because of significant health effects, including foetal brain damage (see *soil & Health* 2000, Vol 59 Nos 1 & 4). MAF are now using Decis, or deltamethrin, a synthetic pyrethroid with less drastic human health effects. *But,* here's the problem: unlike Btk, Decis is highly toxic to aquatic life, so MAF couldn't spray it along the Whau Creek and other riparian margins – which of course is where the PAM caterpillars are rapidly multiplying. Now this pest is spreading out of control and MAF is having to resort to aerial spraying with Btk, amid mounting community concern. They would not be in this position now if they had used Btk from the start in their ground spraying operations.

There is considerable community opposition in West Auckland to MAF's plans to helicopter spray selected areas with the Foray 48b formulation of Btk, because of reported health effects when this product was used in East Auckland. While the official public health investigation into these effects did not establish a link with the spray, neither could it explain what caused the effects. The sheer volume of anecdotal evidence lends credence to the view that some people are likely to get ill from exposure to Foray 48B. How many? There is no answer. But there is an investigation underway into a reported cluster of thyroid dysfunction in

the spray zone in East Auckland. Foray 48B is the safest insecticide that could be used, but that safety is only relative, not absolute.

The fiasco continues: MAF have recently discovered that Waitakere City planning rules forbid low-flying helicopters without a consent. The media reported that Minister Jim Sutton wanted to declare PAM to be an emergency under the Biosecurity Act – that means planning laws can be over-ruled. But the next day, Sutton said he *hadn't* declared an emergency. Back to the Council table. But not for long. On 11 December Minister Sutton announced that the spraying programme would be exempted from the provisions of the Resource Management Act under Section 7a of the Biosecurity Act – this means that Waitakere's planning rules can be overridden without an emergency being declared.

Meanwhile frustration is mounting in the community. MAF set up a community Advisory Group (CAG), ably chaired by West Auckland resident Kubi Witten-Hannah, and has met with this group a number of times. However MAF appears to regard this group simply as a means to fulfil its obligation to consult, rather than as an opportunity to actually work *with* the community. The community wants the moth gone, but it does not want the healthy of its members or its environment compromised. CAG has been diligent and inventive in proposing alternative methods to MAF, including trialing a non-toxic biodynamic peppering* method. MAF have agreed to consider a proposal for such a trial if it is put in front of them (the proposal is being written by Hanafiah Blackmore of Society Targeting Overuse of Pesticides, STOP). However MAF have 'failed' to provide detailed data on where moths are being trapped, and that data is essential for determining where the trial should be carried out. It is also essential for keeping the community informed of developments.

MAF have said that they are carrying out trials to see how far foray 48B will drift when sprayed from a helicopter, but they have also 'failed' to provide information on the protocols of this trial to CAG as requested.

Even worse, MAF have steadfastly refused to respond to the continual requests to stop using Decis and replace it with Btk. They say that residents can ask MAF not to use Decis if they are concerned about health effects (at the same time telling them there aren't any), but fail to extend this right to neighbours who get drifted upon.

The saga continues: finally in mid-December they agreed to switch to Btk; the community is getting increasingly angry at the bungle; and the caterpillar continues its inexorable spread. Aerial spraying is due to begin in January, but there is serious concern that it is too late for the proposed targeted spraying and that the only thing that will get rid of it now is the return of the DC6 zooming across the skies of Auckland, dropping its load of Foray 48B. At some point we may have to come to the realisation that it might be too late – that the PAM may have spread out of control.

*peppering:
A biodynamic process, based on the philosophy of Rudolf Steiner, that involves taking the ashes of burnt moths, mixing them with water and spraying in very dilute form over the infested area. It is non-toxic and does not kill the moth. It works on a vibrational level, discouraging the moth from breeding so that the population dies out.

==========

**Known human health effects of deltamethrin (Decis)**

Acute exposure effects in humans include the following: anxiety, burning sensation and tightness and numbness on the face, convulsions leading to muscle fibrillation and paralysis, dermatitis, dizziness, eye-watering, oedema, diarrhoea, headache, heartburn, hepatic microsomal enzyme induction, irritability, nasal discharge, peripheral vascular collapse, serum alkaline phosphatase elevation, shortness of breath, tinnitus, tiredness, tremors uncoordinated movement, vomiting and death due to respiratory failure. Allergic reactions have include the following effects: anaphylaxis, bronchospasm, eosinophilia, fever, hay fever, hypersensitive pneumonia, pallor, sweating, sudden swelling of the face, eyelids, lips and mucous membranes, and rapid heartbeat.
*Source: Extoxnet – http://ace.ace.orst.edu/info/extoxnet/ghindex.html.*

**Effects of foray 48B reported in East Auckland**

Allergy, asthma, eye problems, 'hay' fever, headache, irritability, itchiness, miscarriages, runny nose, skin rashes, sleep disturbances, sneezing, throat symptoms, thyroid problems.
*Source: Health surveillance Report, Operation Evergreen. Report to MAF, May 2001. Aeraqua Medicine Ltd.*

**Why foray 48B is not an organic spray**

MAF call foray 48B an organic spray. It is not. *Bacillus thuringiensis* kurstaki, the active ingredient, is a soil bacterium that is specific in its toxic effect to caterpillars. It is allowed to be used in organic agriculture. But Foray 48B contains synthetic chemicals such as a sunscreen to make the Btk last longer in the environment and these are not allowed in Organics.

***End***

==========

**Submission to People's Inquiry – 76 (See 118 for written submission)**
**Exposure: worked in spray zone**
**Ron**
**Oral testimony transcription only**

***End***

**Submission to People's Inquiry – 77**
**Exposure: lived in spray zone (hot spot)**
**Oral testimony: No**

Since the SPRAY in West Auckland I always have hoped that there will be some discussion, some understanding and some change that will follow this sad saga.

We bought our house in Glen Eden at the end of summer in 2003. I was 44 years old and heavily pregnant with my second child. My partner was an ill man suffering from neurotoxicity which he developed as a result of paint fume inhalation while working as a painter. His symptoms were varying from sudden mood changes, through sleeplessness, restlessness, loss of appetite, lack of motivation, slowness of thinking and movement, severe memory loss, tremor, and fatigue to headaches and dizziness.

Chemical smells including cigarette smoke, paints or household cleaners would trigger any of his symptoms. We were very aware of his condition - more so as it had quite an effect on our relationship - and attempted to eliminate triggers from our life. Thus we consumed organic food (also cutting out milk and wheat from our vegetarian diet), we used products that are environmentally and user friendly, and generally lived a carefully healthy lifestyle. We have moved to Glen Eden because this was financially feasible for us.

I don't remember if the spraying has started already when we moved in, or not. I only remember that once we became aware that we were in the middle of a 'war zone', our world came down crumbling. There we were, a so called older couple with our precious baby in my belly: being poisoned. We didn't really know what to do.

First I contacted my friend in Denmark who is a highly qualified microbiologist specialising in the effects of chemicals on bugs (he used to work for MAF in Palmerston North and left New Zealand for Denmark as he was over qualified for NZ circumstances). He said that he is professionally following the spray story in NZ and he is convinced that the NZ government and MAF lost their marbles in this case. That was not very good news for us then. So I tried to contact people in Auckland and see what options we would have to get out of the 'war'. Moving away was out of question, partly because my baby was due in June and I felt that I would not survive yet another shifting, and partly because of finances.

We decided that we are going to survive the MAF attacks by sealing our house and leaving on spray days. It was a decision that was very difficult to achieve in practice. We have not realised until we were in the middle of the whole madness what it meant. It meant to get up very early in the morning to call the moth-line and ask if the spraying is happening on that day and what time it'll reach us. The getting up bit was already not easy as we were both bad sleepers (my partner because of his condition, and I because of my pregnancy). Then the spraying was often delayed or postponed as it was dependent on the weather conditions. When it was "smooth sailing" we still had to seal the house, lock up our cat, and shoot out of the area before the plane came.

It was extremely traumatising experience. I remember the first time we went out to Laingholm beach on the spray day, and when the plane flew over our heads (it was its turning place coincidentally), I burst into uncontrollable crying. I was in agony for my beloved cat who was left behind alone in the closed up house with this extreme noise frightening him. I was also triggered by the roaring sound of the low flying plane - growing up in Hungary after the war this was not an easy thing to cope with.

Then after the spraying was finished and we decided to go home and try to have a rest, we were always suffering from sore throat and runny eyes and nose. My partner had very bad headaches and he was always in terrible mood for a couple of days afterwards, and I usually had developed sinusitis and also headaches.

As I recall we were reimbursed by the moth people for some $80 to cover the additional costs that incurred because we had to leave our homes. We were not eligible for accommodation costs so we could not move out for a few days as some of our friends with health symptoms were able to do. And I forget on what reason we were paid only once, in spite of my trying at least get some reimbursement on other spray days.

Finally the spraying has stopped before our baby was born - it seemed that some of our prayers were heard! But then it restarted in restricted areas, and unfortunately we were in the drift zone of one of them residing just on the West side of the Waikumete Cemetery. We did not believe in our bad luck.

Our child was born two weeks earlier than expected. As I was a healthy, very fit and strong woman who had no complications during her pregnancy, I believe that this was due to the stress and the chemicals involved in the spraying. I also had developed very severe postnatal depression by the time my baby was about three months old, and it lasted for over a year. I was in the care of a psychotherapist who was very concerned about my mental state and my ability to look after my baby in this state. It was devastating news, even more, as after the birth of my first child I have not experienced any depression at all. I now believe that this was at least partly due to the effects - both psychological and physical - of the spraying.

My child is now 33 months old and appears to be a healthy infant. However, I have my doubts: although he is still breastfed and is on a very healthy diet, he often contracts minor illnesses, especially respiratory type ones. I still suffer from regular sinusitis and my immune system is very compromised.

I also wonder: my brother who was 40 years old in 2003 had visited us from Hungary for a short period in that April. It was in the middle of the 'war', although there were no sprays while he was with us. He then was very surprised of our anguish, as he said it was an every summer occurence in Hungary to be sprayed on (against mosquitoes, with publicly unknown agent). He is dead now. At the end of 2003 he was diagnosed with stage 4 melanoma, and by the end of 2004 he had died. We know now that melanoma is not simply a cancer caused by sun exposure but it is an environmental disease.

My wondering is that are we all going to end like he did: in an agony that I witnessed and never wish on anybody to witness or go through.

Thank you for the opportunity for being heard. Maybe the crushing sense of powerlessness will subside a little in me now.

***End***

***----------***

**Submission to People's Inquiry – 78**
**Exposure: lived in spray zone**
**Oral testimony: No**

In January of 2002 I conceived my second child. Shortly after, MAF began its eradication programme for Painted Apple Moth. By the time of the third spray in March my baby was no more. It had died shortly after the second spray in February but I was unaware of this until March as it was not expelled, requiring me to undergo surgery to remove it. Two days after my surgery MAF sprayed for the third time.

As you can understand this was a very hard time for me and extremely stressful. The stress was compounded by MAF's blanket refusal to accept that Foray 48B is not safe in pregnancy. Despite the stress I was pregnant again in July 2002 and endured spraying for the entire pregnancy and the first year of my son's life, for much of it on a weekly basis as we live 400m from Waikumete Cemetery.

Sometimes we were sprayed 3 days in a row as MAF miscalculated the weather conditions. Each time we rang the hotline we were given conflicting information by the staff, many of whom had no idea what they were talking about. They would tell us the spraying had stopped and five minutes later the plane would do a low pass over our house.

MAF continues to tell us that the spray is safe. If it's so safe then how come we never saw any of them volunteering to bring their kids or pregnant relatives to live here while the campaign was underway? I kept my daughter inside while the planes were out. When I sent her to kindy the next day she came out in water like blisters after playing in the grass. She is now 6 and has sinus problems that were non existent before Foray 48B. My mother is the same and my minor hayfever is now major all year round, requiring antihistamines every day.

A friend of mine moved to Wellington during the spray campaign. She rang MAF as she wanted to take her rose bushes with her and they duly sent someone out to spray them for her. They used a can of Raid flyspray! Guess we know what is in Foray 48B now!

I am disgusted with our government. They have no regard for people's health and I am appalled that they say we have no right to know what is being dumped on our children! We have lived in the spray zone in Glen Eden since 1997 and had never even heard of PAM until the spraying was to begin. Waikumete Cemetery was supposedly riddled with caterpillars but we have never even seen one despite living 400m away. I still don't even know what they look like but if I ever found one MAF would be the last person I would call! If they had done their job correctly in the first place this never would have taken place.

***End***
**----------**

**Submission to People's Inquiry – 79**
**Exposure: lived in drift zone**
**Oral testimony: No**

## PEOPLES INQUIRY SUBMISSION

During the course of the spraying our family was severely disrupted, especially my daughter. At the time, she was in 5th and 6th form, and NCEA was in its first year of introduction for both years, the most important times of her high school education.

Her education was affected greatly. She had to miss many days off school when the MAF helicopters were spraying nearby due to the drift. Not only this but she had to miss an NCEA level one exam as they were spraying the day it was conducted and she was not allowed to re-sit the test another day. Because of this she had to get compassionate consideration, and even though her drama teachers put in a submission that in their opinion she would have attained an "Excellent" pass, the NCEA qualifications authority passed her with a mere "Achieved" and this affected her overall marks. As you can imagine she was very upset about this.

On one particular occasion the MAF helicopter sprayed our home even though we were not in the direct spray zone. I watched the plane as it came up the motorway course towards our house with spray gushing out, and it just kept coming and coming and sprayed right over us. I phoned the helpline immediately and asked what they thought they were doing and was told that they couldn't do anything, I would have to put in a formal complaint. This I did, and received a letter in reply saying that we were not in the spray zone and that we had not been sprayed. To this, I called and put someone in the picture on the other end in no uncertain terms that we had indeed been sprayed and I had neighbours as witnesses. I was called back later that evening by someone saying they were Robert Isbister's assistant and that they had checked the records of the spray for that day and they had sprayed us and that they were very sorry and he made all sorts of offers of assistance in relocating us during spraying etc. I told him that I was not sitting with our bags packed for days on end waiting to hear if they were going to spray or not, just don't spray our house again and we will be able to cope.

After this episode of spraying, our whole family came down with flu-like symptoms, diarrhoea and a terrible cough. Our daughter has always been allergic to sprays and Foray 48b certainly was no exception. Every time MAF sprayed, whether she had been exposed or stayed at home indoors, she would have some sort of reaction, and had to have homeopathic treatment, at our cost, approximately every three weeks after spraying. Prior to spraying, we had her allergies well under control and she only needed treatment perhaps once every six months or so. One particular time she was very sick and we couldn't make out why she had such a bad reaction as she had been kept at home whilst spraying took place. It evolved that when she had gone back to school the next day, she had sat on the grass with her friends and eaten her lunch – the very fields that had been sprayed the day before with Foray 48b!!

In our opinion, West Aucklanders were unnecessarily exposed to a chemical with unknown side effects by a Government who used us as guinea pigs. No-one had or has any idea what effects this spraying will have on our health in the future and we believe that they will be very sorry in the future. No-one in Government would listen to our many emails and letters etc, all the Ministers stuck together and ploughed on, but we never once saw them stand under a plane and get sprayed!

***End***

---

**Submission to People's Inquiry – 80**
**Exposure: Moved out of zone to avoid spray – but returned to drift zone in 2004**
**Oral testimony: Yes**

Here is a part of my story about the aerial spraying and how it affected me and my family:

When I first heard about the planned aerial spraying in 2001 I was part of the West Auckland Toxins Awareness Group (TAG). We were organising a petition and submissions to stop the Waitakere City Council using toxic pesticides and herbicides on all the roads, parks and reserves in this city. As the time grew nearer to the proposed start date of the aerial spraying campaign I grew very concerned at what I had learned about the effects of the sprays.

The community group led by Hana and Kubi were doing a wonderful job of informing people and lobbying the government and I was sure that with all the evidence they would somehow stop it happening. Near the end of 2001 it seemed like the government was not listening to anyone. David Cunliffe (MP) said that if he thought the aerial spray would affect peoples health, that it would go ahead over his dead body. Well he is still alive but others are not.

I went to see a pregnant MAF doctor with my concerns for my family's health. We have been chemically sensitive for our whole lives and I knew that this would be a toxic icing to an already poisonous cake, and it could very well be the last straw for me especially if we became more ill than we already were.

She assured me we were not in the drift zone [Shaw Rd Oratia], and that she would happily walk out in under the planes, pregnant, without a worry. She offered no help at all, and dismissed any concerns I had about being unable to be in this city without going near the spray zone. Although our TAG group was focusing on the Waitakere Council's spray programme - (the least toxic of their arsenal of spray's 'roundup' being a hundred times more toxic than Foray 48B, according to a MAF scientist) – it seemed more and more urgent that this programme must be stopped.

I tried in vain to find evidence of safety tests for Foray48B. All I found was one test done on mice with Btk and the flu virus where all the mice died! To me that was serious, I knew that the Waitakere Councils spray programme made many people ill with flu -like symptoms, and that to top it off with Foray48B could, and I believe was, lethal!

I attended the last Council meeting for the year on December 19 2001. It was a last ditch attempt by ours and other groups to plead with the Council to have the aerial spray programmed stopped, as well as their own spray programme. I had been on the phone all day trying still to find evidence of safety tests and looking for alternatives. I reluctantly spoke to someone at Nufarm, the chemical company making Foray 48B. No safety tests, no samples for Bio-gro who said they would test it to see if it was safe to spray on a population.

I went to the meeting feeling afraid of what I was doing, worried for my children who wouldn't come with me. I was praying for our safety on the way to the meeting. As the Council meeting was opening with a prayer, someone was burning my house to the ground.

To this day I don't know who it was, but I have this morbid fear to have anything to do with MAF or the Council. I am genuinely afraid for the safety of myself and my children, whether it is the damaging effects of the poisons the Government allows to be sprayed on land and in the sky, and the government, councils and chemical companies who seem to have money as their highest value, and make a pretence of caring about the environment and the health of people and animals.

I told the Council at the meeting that day, as my house was burning, that I could find no evidence of safety tests for the aerial spray programme, and that if it went ahead I would have to leave the city because I knew it would harm my family; someone made it easier and more urgent to leave, and I did so on New Years eve 2001.

***End***

---