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Rotterdam Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade

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Listing of chemicals in Annex III to the Rotterdam Convention: review of notifications of final regulatory actions to ban or severely restrict a chemical: endosulfan

Endosulfan

Note by the Secretariat

Addendum

Additional supporting documentation provided by New Zealand

The Secretariat has the honour to provide, in the annex to the present note, additional documentation received from New Zealand to support its notification of final regulatory action for endosulfan as a pesticide. The documentation has been reproduced as received, without formal editing by the Secretariat.

* UNEP/FAO/RC/CRC.6/1.

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Annex

1. Application for the Reassessment of a Hazardous Substance under section 63 of the Hazardous Substances and New Organisms Act 1996: endosulfan and formulations containing endosulfan.

ERMA New Zealand
Update paper

Application for the Reassessment of a Hazardous Substance under section 63 of the Hazardous Substances and New Organisms Act 1996

Name of substance: endosulfan and formulations containing endosulfan

Application Number: HRC07003

Prepared for the Environmental Risk Management Authority

Contents

Section One – Summary of new information received

ERMA New Zealand's application for the reassessment of endosulfan and formulations containing endosulfan was publicly notified on 27 June 2008. Submissions were accepted until 8 September 2008. A total of 187 submissions were received. ERMA New Zealand has summarised the issues raised in the submissions under topic headings and commented on each of the issues (see table, Section 2 below). The full text of the submissions is available as a separate document upon request.

In addition to submissions received, the following information has been received since the application was publicly notified.

2.1 Responses to questions raised in the application

In the Executive Summary of the application ERMA New Zealand requested information on a number of areas. The following summarises the responses received:

1. *What alternative substances are available, how effective are they and what risks, costs and benefits are associated with their use in New Zealand?*

   Pesticide Action Network: The claim by Horticulture NZ that there is no alterative to endosulfan for Red Berry mite is not accepted; there are safer alternative substances:
   Management of Red Berry mite can be achieved by use of lime sulphur: for varieties that retain a leaf canopy through the winter, begin lime sulfur applications at bud break and continue at 3-week intervals up to 12 days before the start of harvest. For varieties that naturally defoliate over the winter, apply lime sulfur before buds break dormancy but then not again until canes have a full leaf canopy and first bloom appears.
   Horticultural oils, when used at the rate of 1.2 to 2% volume to volume, applied after green fruit or first pink fruit stage in four consecutive applications spaced 2 or 3 weeks apart give significant control of Red Berry mite. (UC 2008)
   There are also safer alternatives to endosulfan for Cyclamen mite in strawberries:
   Management of cyclamen mite requires carefully timed sprays of miticides that do not harm natural enemy populations. Prevent its introduction into strawberry fields by following good cultural practices. Propagating nursery stock free of cyclamen mites is essential to prevent introducing populations to fruit-producing fields.
   Cultural Control - dip trays of long-term cold storage (28°F) transplants into a hot water bath for 7 minutes right before planting to prevent infestation. Prepare plants for this treatment by thoroughly washing them to remove all dirt; then place them in a circulating water bath that is held at a constant temperature of 120°F. Afterwards, submerge them in very cold water and then plant them as soon as possible. Avoid second-year plantings in problem areas. To slow the spread of infestations, remove infested plants as soon as symptoms appear.
   Two naturally occurring predatory mites of cyclamen mite are Typhlodromus bellinus and T. reticulatus, but their populations build up too slowly to provide economic control. Early season releases of the commercially available predatory mite, Amblyseius californicus, may be able to control this pest mite. When pest populations become large, the six spotted thrips, minute pirate bugs, and western predatory mite (Galendromus occidentalis) all feed on cyclamen mites. All of these beneficial insects are damaged by endosulfan.

Abamectin is a safer alternative spray. (UC 2008).
Broadmite on citrus can be controlled by sulphur (UC 2008). Endosulfan is not essential.

2. *Can the application rate (0.7 kg a.i./ha) or frequencies for label use be reduced without compromising efficacy?*

   Makhteshim: The rate of 2L/ha (0.7kg a.i/ha) is the maximum label rate currently on Thionex Insecticide. This rate is a robust rate and has proved effective with growers in many crop situations. As has occurred with other pesticides, such as SPs and OPs, the use of lower rates has accelerated resistance issues. We would strongly recommend that robust rates be maintained to avoid an acceleration of insecticide resistance.

3. *Can the application rate used on turf (2.1 kg a.i./ha) be reduced without compromising efficacy, in order to reduce operator exposure (when using full PPE) to acceptable estimates?*

   Makhteshim: Turf is an off-label use and we offer no comment.

   NZ Sports Turf Institute response: The answer to this is that the turf industry could achieve the desired level of earthworm control with endosulfan applied at 613-700g a.i./ha/application. The quoted application rate of Thiodan, Thionex or Flavylan at 6L/ha (2.1kg a.i./ha/application) on turf is extraordinarily high and does not reflect the norm for the turf industry.
   Although there will inevitably be some variation as to the rates with which endosulfan is applied to turf (1.5-2.5L/ha), the norm or industry standard is 2L/ha (0.57kg a.i/ha/application).
   The basis of the industry standard for endosulfan can be traced back to 1976 when endosulfan had a turf registration for controlling both earthworms (613ga.i./ha) and Porina (525-700ga.i./ha). This was originally published in: "A Guide to Agrichemicals" 1975 Agricultural Chemicals Board – and then reformatted for the turf industry where it was published in the Sports Turf Review No.111, October 1977.

4. *In order to reduce health risk to operators, most uses require the use of "full" PPE consisting of gloves, face shield during mixing loading and gloves, overalls, hat and boots during application. If this level of PPE were made mandatory, would continued use of the product be feasible?*

   Makhteshim: Agronica believes that most commercial operators understand the importance of and follow the guidelines for use of PPE. We do not believe that making the use of "full" PPE mandatory will be a major issue as this is generally current good agricultural practice used with Endosulfan.

   NZ Sports Turf Institute: For turf, these requirements would not pose a problem and would generally be regarded as the norm for most turf managers applying an agrichemical.

5. *Re-entry risks for workers (and 'pick your own') are estimated as high for horticultural applications since these personnel do not generally use PPE. In this case, REIs*

represent an important means of addressing these exposure risks. Are the REIs set out above feasible?

Makhteshim: We would propose to adopt recommendation of the REIs and place this information on our label.

6. *What would be the effect of a mandatory 48 hour closure period after one annual turf application and watering in for "ground contact" sports, such as rugby, football or hockey and use on public parks where young children may play?*

Makhteshim: Turf is an off-label use and we offer no comment.

NZ Sports Turf Institute: The general consensus amongst councils is that this would require additional planning but would be workable (see **Appendix D** below for Council survey results).

7. *What would be the effect of a mandatory 100 m (or more) buffer zone to reduce exposure to non-target areas including the aquatic environment?*

Makhteshim: We have provided a Tier II modeling study that has not been considered before issuing the Application Summary. The proposed mitigation measure of 100m buffer zone is not justified for ground applications. The Tier II analysis demonstrated that the percent of protected species is very high using the worst case application scenario even without a buffer zone in place. We believe that the addition of a moderate buffer zone of 30m is a more acceptable and practical risk mitigation measure that delivers an acceptable ecological risk mitigation outcome. US EPA has requested a 30m buffer zone for ground boom spray applications.

PAN
The aquatic risk assessment and the setting of a potential buffer zone should also take into account the frequent flooding New Zealand experiences, which will wash residues into the aquatic environment. Flooding is not an unusual event – it is part of everyday life, it happens every year. Therefore endosulfan should not be used in any area where flooding can occur.

NZ Sports Turf Institute: The general consensus from our council survey is that a 100m buffer zone between treated areas and any waterways, would restrict the treatment of a number of venues or facilities that could be treated for earthworms. For the most part (although there are exceptions) councils could accept a 50m buffer zone.
A 100m buffer zone would pose significant problems for many golf clubs and would inevitably prevent them treating some fairways. For golf courses, the preferred maximum buffer zone would be 20m. This buffer zone would still create issues for some golf courses.
The industry would question the need for such a large (100m) buffer zone in that with the exception of fairways and in isolated instances golf greens, the risks of runoff of endosulfan posed from the turf industry are considered minimal as:
i. Surface contours on sports fields, bowling greens, croquet lawns etc are essentially "flat" and therefore except in extreme rainfall events, runoff is unlikely.

ii. The pesticide is applied in close proximity to the ground (0.5m approx) by a boom sprayer.
iii. The pesticide is washed in after application, further reducing the risk of run off.
iv. For the most part, the pesticide would be applied to a situation with full turf cover and significant thatch (organic matter layer), that both adsorbs the pesticide and minimises risk of runoff (typically associated with soil particles on cropping situations. For safety reasons, it is normal to have a grass cover or shrubbery between waterways and most turf areas.

2.2 Tier II environmental (aquatic) modelling

In the application, ERMA New Zealand noted risks to the aquatic environment as being "high" and also noted that there was a degree of uncertainty about this that might be resolved by further exposure modelling. Makhteshim Chemical Works (one of the registrants) provided further exposure modelling on 2 July 2008 (Schupner & Mackay, 2008) and ERMA New Zealand also commissioned HortResearch to review the new modelling and to run its SPASMO model that estimates runoff losses following application for New Zealand use scenarios. HortResearch's report on this work was received on 26 August 2008 (Müller et al, 2008). In both cases, the additional modelling supports ERMA New Zealand's conclusion of high risk to the aquatic environment. ERMA New Zealand's summary of the two modelling reports is included in **Appendix A**.

2.3 Amendment to section 3.1.5 of the application

The trade name product ENDO 350EC was registered with ACVM on18 June 2008 (shortly before the application was publicly notified). As noted in the application (section 3.1.5) a product by the same name already has an approval under HSNO Act under the substance description emulsifiable concentrate containing 350 g/litre endosulfan (Substance A). ERMA New Zealand has received no submissions on this application from this registrant.

2.4 International legal action

2.4.1 On July 24 2008, a coalition of farm workers, public health, and environmental groups filed a lawsuit against the US Environmental Protection Agency (EPA) to stop the continued use of endosulfan. The coalition is demanding action from the EPA to protect children, farm workers, and endangered species.

2.4.1 On August 20 2008 the EPA placed notice on the Federal Register: (Volume 73, Number 162) relating to Petitions to Revoke All Tolerances Established for Endosulfan. The notice asked for public comment on requests from the Natural Resources Defense Council (NRDC) and Pesticide Action Network North America (PANNA) that the EPA revoke all tolerances for the organochlorine pesticide endosulfan. In addition, this notice solicits information on endosulfan residues in or on commodities consumed by Alaska Natives.
http://www.epa.gov/fedrgstr/EPA-PEST/2008/August/Day-20/p19166.htm

2.5 Residues

2.5.1 On 23 July 2008, the Soil and Health Association reported endosulfan residues in both New Zealand and Australian tomatoes based on random samples purchased from supermarkets and fruit and vegetable retailers.

2.5.2 On 4 July 2008, New Zealand beef exports to South Korea were reported to have been put at risk due to reports of endosulfan resides being found in New Zealand beef by Korean officials. Investigation by the New Zealand Food Safety Authority did not identify a source of contamination.

2.6 Ferry sinking - Philippines

2.6.1 21 June 2008 MV Princess of the Stars sank three kilometres from the shores of Sibuyan Island, in central Philippines, with a toxic cargo containing endosulfan.

2.6.2 The search for hundreds of bodies feared trapped on the capsized ferry was halted after it was discovered that there was 9 tonnes of toxic pesticides on board.

2.6.3 An expert team from the Philippines Government and United Nations conducted a general environmental and health risks posed by the wreck. Till the time of the report no leakage of chemicals (including endosulfan) from the wreck has been detected.

Section Two - Summary of submissions and ERMA New Zealand responses

2.1 All issues raised by submitters will be taken into account by the Authority when it considers this application. A summary of the main issues raised by submitters, and ERMA New Zealand's response to them, is set out in the table below. As stated above, the full text of the submissions is available as a separate document upon request.

2.2 References to paragraphs in the table are references to paragraphs in the application.

Summary of issues raised in submissions

Topic: Recommendations	
Issue # 1	*Hort New Zealand proposes phase-out over 5 years covering 3 years continued purchase followed by a 2 year stock use up period.*
ERMA Response	Horticulture New Zealand proposes a phase-out over 5 years, but does not say on what basis it makes this recommendation. In the application ERMA New Zealand noted some uses (aerial, domestic, airblast application) as being of particular concern and recommended prohibition of those uses. Although no timeframe was discussed in the application ERMA New Zealand recommends that approval for these uses is revoked with immediate effect. As regards other uses, ERMA New Zealand notes Horticulture New Zealand's proposal. The option of an immediate ban or a phase out over a period of time is also available to the Authority. Either option would address concerns expressed by some submitters. If the Authority does consider that the approvals should be phased out over time, ERMA New Zealand recommends that a tighter risk management regime be adopted in the meantime.
Issue # 2	*If the manufacturer is prepared to support use on only tomatoes, potatoes, cabbage, cauliflower, broccoli, gooseberries, blackcurrants, and outdoor ornamentals, it is entirely inappropriate for ERMA to be supporting uses beyond that – particularly turf, sweet potatoes, mustard, radish, turnip, blueberries, sweetcorn. These uses should automatically be prohibited.*
ERMA Response	The reassessment is carried out on a risk basis. There is no evidence to suggest that there is a higher level of risk for the unsupported crops.
Issue # 3	*Endosulfan should apply a precautionary approach and ban endosulfan*
ERMA Response	Revoking the approvals for endosulfan is an option which the Authority will consider.
Issue # 4	*If it were not ERMA itself applying, one would have thought there would have been a good chance of the application being declined on the grounds of lack of required information.*
ERMA Response	ERMA New Zealand believes there is sufficient information for the Authority to consider the application.

Issue # 5	*We recommend that ERMA withdraw this reassessment application and negotiate with the Minister for the Environment a funding package sufficient to make good on the promise to undertake the group reassessment of organochlorines.*
ERMA Response	Further funding for the reassessment programme has been made available with effect from 1 July 2008.
Issue # 6	*Greater accountability in the use of Endosulfan on public parks and sports grounds is sort. The use of Endosulfan on a publicly owned and managed sportsground or playground should be publicly notified and a hearing held by the local Territorial Authority to determine whether the local community support the use of Endosulfan as an insecticide.*
ERMA Response	The preliminary recommendations in the application proposed a number of new controls to manage the risks associated with endosulfan use for turf management, namely limiting it to one annual treatment followed immediately by watering in, with a 48 hour "stand down" period in the case of use at "ground contact" sports fields and public parks where children may play. ERMA New Zealand notes the requirement in the Methodology (clause 35(b)) to invite comment on the "cost-effective" application of controls to achieve a specified level of risk management and that some submitters have indicated that these controls may not be practical. In the light of these comments, ERMA New Zealand considers that there may be valid concerns about the practicality of these controls and notes that, in reaching its decision, the Authority may conclude that these recommendations are no longer appropriate.
Issue # 7	*The use of endosulfan on fodder crops should be prohibited.*
ERMA Response	This is a residue issue. As detailed in section 4 of the application, dietary exposure and risks from residues of endosulfan in food are evaluated by the New Zealand Food Safety Authority under the Food Act 1981.
Issue # 8	*The Tier II modelling study analysis demonstrated that a 30m buffer zone is a more acceptable and practical mitigation measure.*
ERMA Response	As outlined in **Appendix A** to this paper, ERMA New Zealand does not agree with this assessment.
Issue # 9	*All policy development on the use of endosulfan should be aligned with Australian policy*
ERMA Response	ERMA New Zealand is required under the HSNO Act to make a case-by-case assessment of the adverse and positive effects of the use of a substance in New Zealand. Information from other jurisdictions is taken into account in the assessment and evaluation processes. Some Australian uses and circumstances of use are not applicable to New Zealand conditions.
Topic: Costs vs Benefits	
Issue # 10	*A number of submitters expressed their concern that the risks of using endosulfan appear to outweigh the benefits and that there are no benefits to society.*
ERMA Response	The Authority will make the decision as to whether the benefits (positive effects) outweigh the risks and costs (adverse effects). In making this decision the Authority will consider all the potential effects of endosulfan including effects on the environment, effects on human health and safety, effects on Maori cultural and spiritual values, effects on society and community and effects on the market economy.

Issue # 11	*Economic costs and benefits are not measured against a baseline (as required by ERMA's guidance material)*
ERMA Response	In a reassessment, the 'with' (baseline) scenario is known and the 'without' scenario is predicted. In this instance there is little quantitative evidence to develop the 'without' scenario therefore ERMA New Zealand has adopted a precautionary approach in assessing benefits of the substance.
Issue # 12	*The weighing up of adverse and beneficial effects is unfairly weighted in favour of spurious benefits against real costs and risks (no consideration of effects on marine mammals).*
ERMA Response	ERMA New Zealand acknowledges the concern expressed by the submitter but is of the view that the benefits that have been admitted are valid. It should be noted that the benefits are not considered to be significant in the longer term.
Issue # 13	*Lack of evidence that alternative substances and practices would be more expensive*
ERMA Response	ERMA New Zealand has relied on the available information which indicates that this would be the case. Any further information on this issue would be of assistance.
Issue # 14	*Shorter term gains should not be given precedence over long term harms.*
ERMA Response	ERMA New Zealand agrees with the submitter.
Issue # 15	There is significant uncertainty about both adverse effects and beneficial effects
ERMA Response	Agreed. ERMA New Zealand has considered the uncertainty associated with adverse and beneficial effects as part of its assessment and evaluation process. Where adverse effects are uncertain the Authority will apply the criteria in the Methodology to determine whether it will be more or less risk averse.
Issue # 16	*Adverse effects do happen (however improbable)*
ERMA Response	The Authority makes decisions based on the weighing up of adverse and beneficial effects. All effects are measured in terms of magnitude and likelihood. Controls are applied that reduce one or both of these components.
Issue # 17	*Stress to horticulturalists who don't use endosulfan products and psychological and emotional damage to pregnant and breastfeeding women not taken into account.*
ERMA Response	These are valid considerations and will be taken into account by the Authority.
Topic: Banned in Other Countries	
Issue # RT18	*Submitters drew attention to the banning or strengthening of restriction of endosulfan in many overseas countries and stated that New Zealand should follow suit.*
ERMA Response	As part of the reassessment, ERMA New Zealand has reviewed developments in other jurisdictions; indeed action taken overseas was one of the grounds for reassessment. Decisions on appropriate risk management for New Zealand are based on the risks associated with the presence and use of the substance in New Zealand. Many of the use patterns used overseas are not applicable to New Zealand, for example aerial application or use on cotton. Therefore it is not appropriate simply to

	copy action taken overseas without consideration of the applicability to New Zealand. The Authority will take account of action overseas and the risks assessed for New Zealand in considering this application.
Issue # 19	*ERMA should obtain information from countries that have banned endosulfan.*
ERMA Response	ERMA New Zealand has obtained information from countries that have banned endosulfan.
Topic: Persistent Organic Pollutants (POPs) List	
Issue # 20	*Endosulfan has been proposed for inclusion on the Stockholm Convention POPs list. On these grounds alone it should be banned in New Zealand. One submitter also mentioned that endosulfan is also to be discussed under the Rotterdam Convention Prior Informed Consent list and the New Zealand government has said it will support this decision.*
ERMA Response	In the application ERMA New Zealand discusses developments under the Rotterdam and Stockholm Conventions to manage the international trade and use of endosulfan. Indeed this information was one of the grounds triggering reassessment of endosulfan. Such international action may take several years to resolve. The Authority will take this international action into account when considering this application. The fact that action is being considered at the international level does not require or preclude the Authority from taking action based on local risks.
Topic: Alternatives	
Issue # 21	*We don't need endosulfan to produce good food*
ERMA Response	ERMA New Zealand did consider whether crops can be produced without endosulfan (see Section 6 of the application).
Issue # 22	*If there are alternatives available why do we need endosulfan*
ERMA Response	ERMA New Zealand did consider whether crops can be produced without endosulfan. See Section 6 of the application
Issue # 23	*Horticulture New Zealand acknowledges that for all uses on crops such as onions, potatoes and brassicas there are alternatives available, and that endosulfan is not needed although some growers like to have it because they know it will work. This is not a justification for continuing its registration. Many growers of crops such as onions have shown that they can manage without endosulfan.*
ERMA Response	Horticulture New Zealand represents the interests of all registered uses of endosulfan and it is significant to note that they accept that there are alternatives available and that endosulfan is not critical for the industry. ERMA New Zealand considers this a significant new information from the industry.
Issue # 24	*The claim by Horticulture NZ that there is no alterative to endosulfan for Red Berry mite, Broadmite on citrus and Cyclamen mite in strawberries is not accepted. (Information on alternatives given)*
ERMA Response	In its submission Horticulture New Zealand accepts that there are alternative available and that endosulfan is not critical for the industry.
Issue # 25	*Submitters proposed a range of specific alternatives (chemical and non chemical) that could be used in particular situations.*

ERMA Response	ERMA New Zealand welcomes the information provided by submitters on specific alternatives.
Issue # 26	*Submitters noted the need to keep options open while alternatives such as biological control agents are explored*
ERMA Response	The Authority will consider all options for the future use of the substance in New Zealand based on the risk assessment and information received by way of submissions and presented at the hearing. If the Authority decides that a phase out of endosulfan is appropriate, this could expedite the need for users to consider alternative substances or methods of control.
Topic: Enforcement Issues	
Issue # 27	*How can we have confidence that there will be no non-compliance with the controls placed on endosulfan products?*
ERMA Response	Products containing endosulfan have a tracking control and an approved handler control. These controls (as explained in paras 3.7.7 - 3.7.12) have been applied to ensure that appropriately trained and licensed people are responsible for hazardous substances. Records of use throughout the lifecycle of these substances must be kept. Enforcement agencies have the power to check records to ensure that hazardous substances are being used in an appropriate manner.
Topic: Turf Uses/Public Areas	
Issue # 28	*Endosulfan is toxic to humans it should not be used on sports field, playgrounds or golf courses. Children and people of all ages are being put at risk by continued use.*
ERMA Response	A number of controls were proposed to reduce the risks of exposure to endosulfan under these conditions. Based on the modelling data ERMA New Zealand considers that these controls would significantly reduce the risks, although there may be issues over the practicality of the controls. It is open to the Authority when reaching its decision, to ban use on turf.
Issue # 29	*Other countries manage their sports fields and turf without endosulfan.*
ERMA Response	It is reported that earthworms can be managed successfully without endosulfan by using acidifying fertilisers such as ammonium sulphate, ammonium nitrate, or iron sulphate, and by improving drainage (Kirby & Baker 1995). Appendix I to the application lists a number of alternatives to endosulfan for earthworm control on turf.
Issue # 30	*The practitioners in the turf industry have come to rely on endosulphan to control earthworm populations*
ERMA Response	Use of endosulfan on turf is an 'off label' use. As such there are no current set application rates. The preliminary recommendations in the application proposed a number of new controls to manage the risks associated with endosulfan use for turf management, namely limiting it to one annual treatment followed immediately by watering in, with a 48 hour "stand down" period in the case of use at "ground contact" sports fields and public parks where children may play. ERMA New Zealand notes the requirement in the Methodology (clause 35(b)) to invite comment on the "cost-effective" application of controls to achieve a specified level of risk management and that some submitters have indicated that these controls may not be practical. In the light of these comments, ERMA New Zealand considers that there may be valid concerns about the practicality of these

	controls and notes that, in reaching its decision, the Authority may conclude that these recommendations are no longer appropriate.
Issue # 31	*If the manufacturer is prepared to support use on only tomatoes, potatoes, cabbage, cauliflower, broccoli, gooseberries, blackcurrants, and outdoor ornamentals, it is entirely inappropriate for ERMA to be supporting uses beyond that – particularly turf, sweet potatoes, mustard, radish, turnip, blueberries, sweet corn. These uses should automatically be prohibited.*
ERMA Response	The reassessment is carried out on a risk basis. There is no evidence to suggest that there is a higher level of risk for the unsupported crops.
Topic: Application/ Controls	
Issue # 32	*Use of full PPE for operators is not feasible or enforceable.*
ERMA Response	Consideration of the practicality of controls and whether they are likely to be adhered to is part of the ERMA New Zealand assessment process. Industry has responded by saying the full PPE would be a matter of good practice for products such as those containing endosulfan.
Issue # 33	*Buffer zone should be 150m - the same as the APVMA*
ERMA Response	As recommended in the application, ERMA New Zealand believes a 100 m buffer zone is appropriate.
Issue # 34	*Proposed restrictions would not be financially viable for (citrus) industry*
ERMA Response	The recommendation to prohibit airblast use on citrus is based on a significant level of human health and environmental risk. ERMA New Zeealand believes the proposed recommendation is appropriate.
Issue # 35	*The buffer zone proposal is based on an assessment that omitted to include flooding.*
ERMA Response	The environmental modelling is mainly concerned with spray drift and run off. Flooding has not been considered as this would introduce a significant dilution of the run off.
Topic: Human Health	
Issue #36	*Link to human health effects (particularly cancer, reproductive/developmental toxicity and autism.*
ERMA Response	Many submitters claimed that endosulfan may be the cause of increased cancer, particularly breast cancer, rates in New Zealand. A key basis for such claims is the effect endosulfan has on breast cell grown in vitro (outside the body). The key question must be the relevance of such studies to the route and extent of exposure to endosulfan and whether this is sufficient to cause stated effects on human health. Clearly this also relates to whether or not endosulfan is considered a carcinogen (see below). In relation to reproductive and other effects in humans see other responses on endocrine disruption and overseas studies.
Issue #37	*Concerns about endocrine disruption from endosulfan, and how this aspect is addressed.*

ERMA Response	ERMA New Zealand assessed evidence relating to the ability of endosulfan to cause endocrine disruption and concluded that the evidence is not strong (as have other overseas authorities). In reaching this conclusion, ERMA New Zealand is not claiming there is no evidence at all of such activity, rather that the balance of the evidence indicated that endosulfan is not substance which acts strongly as an endocrine disrupter. In this context it was commented that this represented a mechanism of action (for reproductive/developmental effects, and target organ toxicity in particular), and that studies did not support a HSNO 6.8 classification. Some submitters interpreted this inappropriately as indicating no action could be taken. ERMA New Zealand has the option of triggering controls aside from classifications and would do so if that that option was considered justifiable. That step was not recommended in the application due to the equivocal nature of evidence in relation to endosulfan, and the fact that other toxicity classifications trigger significant controls.
Issue #38	*Persistence and presence of endosulfan in our bodies and breast milk.*
ERMA Response	ERMA New Zealand notes that little information is available on the concentrations of endosulfan in the bodies of New Zealanders and human breast milk, and that endosulfan was not included in the Ministry for the Environment's extensive survey of persistent organochlorine chemicals (carried out 1997 - 2000 approximately). ERMA New Zealand notes there is evidence from overseas of the presence of endosulfan in body fat and milk. ERMA New Zealand understands that the levels are far lower than for other chlorinated insecticides (such as DDT and its derivatives) which are far more persistent and bioaccumulative. If a decision is taken to retain food related uses, the residue aspect will be addressed by the NZ Food Safety Authority, since most endosulfan exposure will be from dietary sources.
Issue #39	*That inadequate consideration has been given to neurotoxicity*
ERMA Response	ERMA New Zealand notes that one of the mechanisms of toxicity from endosulfan is neurotoxicity and that neurotoxic effects typically occur after very high acute exposures. The proposed controls on endosulfan would ensure that such exposures are unlikely.
Issue #40	*That ERMA New Zealand has incorrectly or selectively used data from particular sources such as ATSDR, in relation to reproductive toxicity, mutagenicity and/or carcinogenicity.*
ERMA Response	ERMA New Zealand has reviewed the data and attempted to take into account the most recent technical reviews. ERMA New Zealand believes that the technical review has taken into account the overall dataset, and applied caution where information is lacking.
Issue #41	*That inadequate consideration has been given to the need for precaution when addressing uncertainty in the data relating to human health effects.*
ERMA Response	Where data are uncertain or differ, a 'weight of evidence' approach is usually taken and this involves judgement about the reliability of different studies (particularly whether they have been performed according to more recent standards). It is important to note that while the HSNO regulations may provide constraints on the classifications that may apply based on data, it is possible to apply additional controls when they are justified under the Act.
Issue #42	*Inadequate account has been taken of human data from India*

ERMA Response	When considering the relevance of studies attributing toxic effects in humans to endosulfan, uncertainty is introduced due to other factors to which the population may be exposed, so there may be some uncertainty about whether or not the effects are attributable to endosulfan. ERMA New Zealand noted those concerns and also that the nature of the controls on the use of the substance may be different in New Zealand to those that would have applied or be followed in India.
Issue #43	*Inadequate account has been taken of higher acute toxicity of endosulfan in female rats.*
ERMA Response	The HSNO 6.1 acute toxicity classification for endosulfan is primarily "driven" by the inhalation classification which is 6.1A. The precise classification is not critical; what is important is the controls that are applied to the substance as a result of the classification.
Topic: Residues in Food	
Issue # 44	*It is unethical for ERMA not to report on residues in food as part of its assessment for this review.*
ERMA Response	As detailed in Section 4 of the application, dietary exposure and risks from residues of endosulfan in food are evaluated by the New Zealand Food Safety Authority under the Food Act 1981.
Topic: Animals	
Issue # 45	*ERMA has not addressed the issue of contamination of New Zealand's marine mammals despite substantial scientific data on the contamination of marine mammals elsewhere in the world. Evidence from elsewhere in the world should have been used to evaluate the risks to marine mammals.*
ERMA Response	In the application, ERMA New Zealand discusses the bio concentration/bioaccumulation/biomagnification (BMF) processes by which marine mammals might accumulate residues of endosulfan (paras 4.3.29-4.3.32) and USEPA model biomagnification potential in aquatic ecosystems and conclude that, except for air-respiring marine organisms, such as marine mammals, there is a low potential for biomagnification. BMF for marine mammals are of the order of 22, compared to measured values of 1-7 for beluga and ringed seal (para 4.3.33). There is however, considerable uncertainty around this modelling. ERMA New Zealand was unable to identify any marine mammal effects or residue data from New Zealand waters and none have been submitted as part of this reassessment. ERMA New Zealand was also unable to identify any data relating to concentrations in New Zealand waters. In the absence of such information, it is not possible to determine local environmental concentrations (para 4.3.37), although extrapolating from remote regions in other parts of the world, low concentrations would be expected. In the absence of exposure concentrations, risk cannot be evaluated (para 4.3.37). ERMA New Zealand noted the low usage in New Zealand (5-7 tonnes/year approx) compared to global usage decreasing from 13,000 tonnes/year in 2001 and indicated that, given the potential for long-range transport, New Zealand will be affected by global emissions (para 4.3.36). ERMA New Zealand does not have the tools to manage long-range transport (para 4.3.37) and maintains that it is more appropriate for this to be addressed at the international level through the Stockholm and Rotterdam Conventions.

Issue # 46	*Concern about the toxicity to aquatic life*
ERMA Response	Toxicity per se does not indicate a need for stricter controls; it is the comparison of toxicity with exposure that triggers the need for risk management. ERMA New Zealand takes the toxicity to aquatic life into account in its risk modelling (paras 4.3.36-4.3.73). The conclusion of this modelling is that there are risks that require management and the introduction of buffer zones was suggested. One submission claimed that the toxicity values used in the aquatic risk modelling (HC5 values) were an order of magnitude higher than a literature report provided by the submitter. ERMA New Zealand used the extensive ANZECC water quality guideline database to derive HC5 values and determines that this provides an adequate reflection of aquatic toxicity. The literature report used the ACQUIRE database. However, there is considerable overlap between the database used in the literature report and that used by ERMA. Both ERMA New Zealand and the authors of the literature report used the same BurrLioz software to calculate the HC5. The reason for the difference in the HC5 values is therefore unclear. The value used by ERMA New Zealand is similar to that used by overseas agencies in their risk assessments. High risk to the aquatic compartment is demonstrated.
Issue # 47	*Endosulfan toxicity to bees is inconsistent with IPM. The report that bees are removed from glasshouses for 3 days after application of endosulfan is quoted as evidence of the unsuitability of endosulfan in IPM programmes.* *There is additional evidence not considered by ERMA New Zealand indicating toxicity to a range of other non-target organisms.* *A submitter claimed that the data used by ERMA NZ to classify endosulfan toxicity to bees (9.4B) should be replaced by a value of 0.8 ug a.i./bee triggering a 9.4A classification.*
ERMA Response	ERMA New Zealand stressed the lack of clarity about effects on bees with high toxicity in the laboratory, but uncertainty as to effects in the field (paras 4.3.88-4.3.91). ERMA New Zealand draws a distinction between glasshouse use, in which bees cannot forage without exposure, and field use in which avoidance behaviour is possible. Field usage showing an absence of effects on bees is reported in para 4.3.88. ERMA New Zealand concluded that endosulfan is toxic to many non-target invertebrates (Appendix B to the application), albeit not all of the specific species identified in submissions. The toxicity value of 0.8 ug a.i./bee was determined from testing an endosulfan formulation. The classification of the formulated product is expressed in terms of ug formulation/bee. In the absence of information on what formulation was tested, the value of 0.8 ug a.i./bee cannot be converted to ug formulation/bee. ERMA New Zealand notes that if the formulation tested had been approved under the HSNO Act (350 g a.i./l) this would trigger a 9.4B classification. Formulation test data are not used to classify active ingredients.

Issue # 48	*It is presumed that endosulfan is toxic to frogs and given the global threats to frogs this should have been taken into account.*
ERMA Response	ERMA New Zealand did not identify information on the toxicity of endosulfan to amphibia. Even in the absence of such information, the risk assessment performed for other taxa in the aquatic compartment indicate high risk that will be taken into account in deciding appropriate risk management.
Issue # 49	*Risk to soil organisms has not taken account of relevant studies.* *The data used to classify endosulfan indicates 3x greater toxicity to earthworms than other literature available.*
ERMA Response	ERMA New Zealand concluded that there are risks to earthworms both in treated areas and outside them in areas exposed to runoff. This conclusion will be taken into account in decision making, notwithstanding information on risks to other types of soil biota. ERMA New Zealand uses the available information in deriving a classification. In this case it is appropriate to use the value showing greater toxicity to classify endosulfan.
Issue # 50	*Risks to birds feeding on earthworms are clearly sufficient to prohibit the use of endosulfan on turf, even without a risk assessment.*
ERMA Response	ERMA New Zealand concurs there is an acute risk to birds feeding on turf, albeit feeding on the grass itself, rather than earthworms for which no assessment was made. The risk to birds feeding on earthworms requires information on residues in worms and assumptions about the proportion of worms in the diet. ERMA New Zealand notes that risks to birds feeding in water do not exceed levels of concern other than for birds feeding exclusively on piscivorous fish.
Topic: Plant Toxicity	
Issue # 51	*Contrary to the application (para 4.3.87) there are data indicating plant toxicity. Toxic effects on plants include altered permeability of root membranes resulting in coiling of the root radical, inhibition of root growth, stunting of shoots, and burning of the margins and tips of leaves (IPCS 1984). Furthermore, Perez et al (2007) found endosulfan to be genotoxic to the wetland macrophyte Bidens laevis L (bur marigold, beggars tick) at environmentally relevant concentrations. It interacted with the mitotic spindle at concentrations of only 5 ug/l, well below the NOAELs reported for chronic toxicity (0.57, 0.67 mg/kg/day). In microalgae it caused DNA strand breaks at concentrations of only 1 ug/l (Akcha et al 2008).*
ERMA Response	ERMA New Zealand notes that the effects noted in IPCS (1984) are reported to be very isolated effects, 'In normal usage, endosulfan has not been shown to be significantly toxic to plants' and the concentrations causing them (1.5 g/kg and 1 g a.i./l) exceed the concentrations expected to arise from normal use. However, ERMA New Zealand also notes that the concentrations reported to be causing genotoxic effects are lower than the exposure concentrations used in the aquatic risk assessment, indicating a risk to plants.

Topic: Environmental Contamination	
Issue # 52	*The toxicity, persistence, bioaccumulation and long-range transport properties of endosulfan are such that its use is contrary to the principles of the HSNO Act and the Treaty of Waitangi and it should be banned.*
ERMA Response	The HSNO Act requires substances to be approved and managed on the basis of a risk assessment. Toxicity, persistence and bioaccumulation are all taken into account in evaluating the risks. Such risk assessment has been performed in this application and recommendations have been made as to appropriate management of those risks. Under the HSNO Act, properties of persistence, bioaccumulation and toxicity do not *per se* mean that the risks cannot be managed. Section 8 of the Act requires the Authority, when considering applications, to 'take into account' the principles of the Treaty of Waitangi. Of particular relevance is the principle of active protection affirmed by the Court of Appeal in the Lands case (1987). Taking into account the principle of active protection encourages the Authority to consider whether this application provides sufficient evidence to show that the potential benefits of the controlled use of endosulfan continue to outweigh the potential risks and costs to iwi/Māori. As part of its consideration of the application and submissions received, the Authority will consider what controls may be needed to manage risks to the relationship of Māori and their culture and traditions with ancestral lands, water, sites, waahi tapu, valued flora and fauna, and other taonga.
Issue # 53	*The application inadequately addresses fate/distribution in air following volatilisation from plant and soil surfaces. ERMA's quoting of APVMA stating that endosulfan is a regional rather than a global air pollutant is inappropriate.*
ERMA Response	ERMA New Zealand recognises that endosulfan will volatilise from plant and soil surfaces (para 4.3.36 of the application) and that given the long-range movement of endosulfan this will lead to contamination of remote regions of New Zealand. However, as stated in the application, ERMA New Zealand does not have the tools to model the distribution of endosulfan following such volatilisation. The application cites APVMA comment on regional rather than global distribution, but in the same sentence recognises that global distribution does occur. ERMA New Zealand notes that atmospheric transport and any resultant management actions are being discussed at the international level, notably the UNEP POP Review Committee. The Authority will consider proposed international actions as part of its consideration of this reassessment.
Issue # 54	*ERMA NZ should manage NZ emissions that contribute to global long-range transport, even though these are very small compared to global emissions.*

ERMA Response	In the application, ERMA New Zealand stated (paras 4.3.36-4.3.37): - the size of New Zealand's use of endosulfan relative to global usage (currently 5-7 tonnes compared to 13000 tonnes worldwide in 2001); - that endosulfan shows a potential to contaminate areas remote from its area of use, but ERMA New Zealand lacks the tools to model atmospheric distribution, particularly at a global scale; - that residues of endosulfan have been detected in remote regions of the globe; - that the assessment of risks from New Zealand usage requires risk management; - that there are discussions ongoing at the international level under the Stockholm and Rotterdam Conventions, that include considering listing of endosulfan as a Persistent Organic Pollutant (POP); - it is ERMA New Zealand's view that global emissions and global contamination is best managed at the international level (Executive Summary). It is noted that if a substance is listed in Schedule 2A to the HSNO Act as a POP it is prohibited from use in New Zealand unless otherwise provided in Schedule 2A. The Authority will take all this information into account when considering this application. The fact that action is being considered at the international level does not preclude the Authority from taking action based on local risks.
Issue # 55	*Metabolites are also persistent and of toxicological concern*
ERMA Response	ERMA New Zealand recognises the persistence and effects caused by some of the metabolites of endosulfan, particularly endosulfan sulphate. Endosulfan sulphate was explicitly taken into account in modelling aquatic risks (para 4.3.61). There are few data on endosulfan diol ecotoxicity but those that do exist suggest it may be less toxic and it was not included in the risk assessment. Toxicity and ecotoxicity studies implicitly take account of metabolites where their formation occurs during the study.
Issue # 56	*ERMA has failed to take account of the intrinsic value of ecosystems.*
ERMA Response	ERMA New Zealand's risk assessment process compares exposure to effects and comment is made as to uncertainties in this assessment. The intrinsic value of ecosystems is only taken into account in as much as risks can be evaluated. Contamination per se does not equal a risk. There is always uncertainty around extrapolation from laboratory, single-species toxicity test data to ecosystem effects and contamination with persistent substances poses the potential for chronic effects that may be particularly hard to detect with laboratory testing. The Authority will take such uncertainty into account in reaching its decision.
Issue # 57	*ERMA New Zealand should have taken account of environmental exposure will occur from glasshouses since when the glasshouses are vented endosulfan will volatilise.*
ERMA Response	ERMA New Zealand stated in para 3.5.43 of the application that environmental exposure arising from glasshouse use would be minimal. This should be qualified since, as the submitter points out, when glasshouses are vented emissions through volatilisation will occur. However, since application rates in glasshouses are the same as those in open fields, and runoff from glasshouse use is much less, the environmental risks inherent in

	endosulfan use in glasshouses will be no greater than those assessed in open fields.
Issue # 58	*Plants bioaccumulate endosulfan*
ERMA Response	The submitter reports the results of studies showing bioconcentration in bulrushes and conifers. The latter study suggests annual removal by US western conifer forests of about 2% of the US usage and suggests other vegetation types may be accumulating even greater amounts. ERMA New Zealand notes that the concentrations reported are very much lower (7.6 mg/kg lipid in fir needles) than those used in the risk assessment of birds eating vegetation (10-500 mg/kg, Appendix F; for comparative purposes lipid content in conifer needles is 1-5%) and would be insufficient to cause toxic effects on birds, but nevertheless this is further evidence of the long-range distribution of endosulfan.
Issue #59	*ERMA has not used all available bioaccumulation data*
	Submitters provide additional reports of measured residues in aquatic fauna. Having considered the new information presented in submissions ERMA New Zealand remains of the opinion that there is uncertainty regarding the potential for biomagnification, but that modelling indicates its possibility for air-breathing aquatic organisms.
Topic: International Reputation	
Issue # 60	*Account must be taken of the impact of continuing to use endosulfan on New Zealand's international reputation.*
ERMA Response	The Authority will consider risk to international reputation from the point of view of New Zealand's 'clean green' image (see paras 4.2.12-4.2.18) and anxiety in society at large over use of the substance, which would include international consumers (see paras 4.2.10-4.2.11).
Issue # 61	*Potential for loss of markets (associated with loss of clean green image)*
ERMA Response	The issue of market access has been addressed in the application. Exporters are responsible for ensuring that their products do not breach maximum residue limits (MRLs) set by NZFSA. When endosulfan is used in compliance with the strict controls governing its use and MRLs are complied with, there should not be any adverse effects on markets. ERMA New Zealand agrees that in the wider context of international market access, a loss of trust in New Zealand produce could have long term adverse effects.
Issue # 62	*Export consignments have already been rejected because of failing residue tests (for endosulfan)*
ERMA Response	Compliance with international market regulations (including MRLs) is the responsibility of individual exporters. Such breaches may affect New Zealand's international reputation.
Issue # 63	*New Zealand wants to maintain its clean green image*
ERMA Response	ERMA New Zealand agrees with submitters that there is economic value in the notion of a 'clean green' image. The Authority makes decisions on a case-by-case basis and takes into account the incremental effect of approvals on international markets as part of the decision process.
Issue # 64	*While New Zealand continues to use such chemicals (a) it risks losing its clean, green image and/or (b) the notion of a clean green image is an illusion*

ERMA Response	The Authority makes decisions based on the weighing up of adverse and beneficial effects. The concept of a 'clean green' image has relevance to effects on the market economy and effects on society and community and is addressed in the application in respect of these areas.
Issue # 65	*We should be working towards chemical free organic agriculture and away from chemical solutions*
ERMA Response	The Authority makes decisions on applications made either for new substances or for the reassessment of existing substances. The Authority makes decisions on a case-by-case basis and while the consideration of the availability of alternatives is part of the assessment (in terms of the 'with' and 'without' scenarios, the Authority must weigh up the adverse and positive effects and will not promote one production system over and above another.
Issue #66	*It is internationally embarrassing that New Zealand still uses this toxic chemical on our food and sports fields. The use of highly toxic, persistent, and bioaccumulative chemicals needs to be phased out rapidly if we are to maintain our international reputation.*
ERMA Response	The option of an immediate ban or a phase out over a period of time for some or all of the current uses of endosulfan is available to the Authority when it considers this application.
Topic: ERMA	
Issue # 67	*The continued use of endosulfan is not consistent with ERMA's stated intent of aligning with government priorities - "growing globally competitive firms, environmental sustainability", "safe communities" and "better health for all"*
ERMA Response	The HSNO Act requires the Authority to make decisions based on weighing up of adverse and positive effects. Government priorities are taken into account in the identification and assessment of effects.
Issue # 68	*ERMA's reputation is at risk if endosulfan is allowed to be continued to be used.*
ERMA Response	ERMA New Zealand makes decisions on a case-by-case basis on the information available to it. ERMA New Zealand applies the decision making criteria in the Act and the Methodology on a consistent basis.
Issue # 69	*ERMA is not representing the public interest in allowing the continued use of endosulfan*
ERMA Response	The Authority will make the decision as to whether the benefits (positive effects) outweigh the risks and costs (adverse effects). In making this decision the Authority will consider all the potential effects of endosulfan including effects on the environment, effects on human health and safety, effects on Maori cultural and spiritual values, effects on society and community and effects on the market economy.
Topic: Further Queries	
Issue # 70	*A number of points were raised that were not directly relevant to the endosulfan reassessment (recycling of light bulbs, concerns about the chemical load on society)*
ERMA Response	Not relevant to this application.
Issue # 71	*What can be done to prevent the import of foodstuffs containing endosulfan residues?*

ERMA Response	As stated above, setting of MRLs is the responsibility of the NZFSA under the 1981 Food Act and are outside the remit of this reassessment which is restricted to the lifecycle of endosulfan and its formulations in New Zealand.
Issue # 72	*This endosulfan review highlights that to be sustainable, New Zealand should be moving to organic agriculture.*
ERMA Response	This is a reassessment of endosulfan. While consideration is given to alternatives to the use of endosulfan, its scope does not extend to a consideration of the merits of organic versus non-organic production systems.
Topic: Quantities	
Issue # 73	*It is acknowledged that quantities of endosulfan used in New Zealand are reducing partly as a result of market pressures. Some submitters feel this demonstrates there is no longer a need to use endosulfan here and indicate restrictions imposed on use overseas.*
ERMA Response	ERMA New Zealand has discussed many of these points in the application (see Executive Summary, paras 3.5.19, 3.5.22-3.5.35). ERMA New Zealand is of the view that reducing use, the closure of some export markets, and the existence of alternatives are factors that will inform a decision, but they do not in themselves mean there is no justification for continuing use since there may be uses for which endosulfan is needed and there may be issues around the use of alternatives.
Issue # 74	*A submitter claimed that use of endosulfan increased 40x between 1998 and 2004.*
ERMA Response	The origin of this claim is unknown. ERMA New Zealand considers that information on use in New Zealand indicating a reduction in use in recent years (see para 3.5.19) is relevant to the Authority's consideration of this application.
Topic: Importation	
Issue # 76	*ERMA has not taken note of the impact on the environment and human health in the countries where endosulfan is manufactured*
ERMA Response	The submitter is correct. ERMA has not specifically considered the country of origin of endosulfan formulations imported into New Zealand. For pragmatic reasons this is the practice followed by ERMA New Zealand in its risk assessments.
Topic: IPM	
Issue # 77	*Comments in favour or use of endosulfan in IPM*
ERMA Response	Points raised by submitters in support of the use of endosulfan in IPM are already included in the application (see paras 4.2.19-4.2.36)
Issue # 78	*Reasons for a decline in the use of endosulfan on particular crops*
ERMA Response	Both brassica growers and the submitter claim that endosulfan use on brassicas has reduced in recent years due to IPM. The submitter claims that endosulfan use is therefore not necessary on brassicas, while the growers claim they need it for when IPM fails (para 3.5.26).
Issue # 79	*Submitters challenged whether endosulfan is compatible with IPM, particularly in glasshouses, because of its toxicity to non-target organisms and claimed that the development of resistance is an issue*

ERMA Response	ERMA New Zealand's application reports laboratory toxicity to a range of non-target organisms but adds that there is uncertainty as to whether toxic effects occur in the field (see paras 4.3.89, 4.3.91, 4.3.271 Table B4, Table B5). Toxicity to other species has been highlighted in other references provided as part of submissions. ERMA New Zealand notes that behavioural effects (avoidance) that may protect non-target organisms in the field, are less likely to occur in glasshouses. As part of the submissions additional information was referenced indicating that resistance to endosulfan has been reported in a range of species. This reference is to a University of Michigan website. The site provides names of pest species, crop and other host plants, but no other details. This information suggests that the claim from Makhteshim included in the application, that 'only a few cases of temporary insect resistance have been reported' may be wrong.
Topic: Maori Issues	
Issue # 80	*ERMA has failed to consult with Maori. ERMA concluded that the use of endosulfan is not consistent with the principle of active protection regarding the principles of the Treaty of Waitangi, as affirmed by the Lands case (1987), but have then ignored this in their proposed decision.*
ERMA Response	The application outlines the extent of consultation undertaken before the application was publicly notified. The submission process allows all interested parties, including Maori, to submit information on the application. The Maori Party has indicated that it would like to see endosulfan banned. A report received from the Maori advisory committee to the Authority, Nga Kaihautu Tikanga Taiao, (see **Appendix B** of this paper) indicates a preference for banning or phasing out endosulfan. These views will be taken into account by the Authority when it considers this application.
Topic: Public Awareness	
Issue # 81	*ERMA approval of a substance will be interpreted as meaning the product is 'safe', leading to a lack of consideration of alternatives and local risks. The submitter quoted an example, 'when I was contacted about a school that was using this product on its playing fields. There was no understanding on the part of the school Principal or trustees who fielded the parental complaints that this chemical was known to be highly toxic, persistent and bioaccumulative, and that the health risk to the children who would shortly be playing on these fields was an appropriate matter of concern.* *There was no appreciation of the greater vulnerability of their children because they had not considered the fact that children are not small adults'*

ERMA Response	ERMA New Zealand's evaluation of the risks associated with the use of a product assumes that the controls on that substance are in place, i.e. that it will not be misused as would be assumed by an 'approval = safe' mindset. It is the convention for regulatory risk assessments that misuse cannot be modelled. Regarding the example given in the submission, ERMA New Zealand did model risks to bystanders, but did not look at the specific example of children exposed to endosulfan treated turf. ERMA New Zealand concluded that risks to adults from exposure to treated turf were high (para 4.3.244), and commented that these could be reduced by watering-in (not included in ERMA New Zealand's modelling, although recommended). The application also stated it did not have sufficient information to determine if this would sufficiently reduce the risk (para 4.3.246). Risks to children from exposure to treated turf would be expected to be greater than risks to adults. The Methodology requires the Authority to invite comment on the "cost-effective" application of controls to achieve a specified level of risk management and that some submitters have indicated that the controls proposed in relation to turf use may not be practical. In the light of these comments, ERMA New Zealand considers that there may be valid concerns about the practicality of these controls and notes that the Authority may conclude that these recommendations are no longer appropriate. ERMA New Zealand did look at risks to children (and operators) from other uses and identified high risks as a result of airblast applications and as a consequence recommended that airblast application to citrus be prohibited (see page 13 of the application).
Topic: Testing	
Issue # 82	*Laboratory testing provides only an indication of effects that may occur in the field but does not take into account interactions including the impact of differing environmental conditions.*
ERMA Response	It is correct that laboratory testing of toxicity provides only an indication of likely effects in the field. However, these tests are designed to maximise exposure and so provide a worst-case scenario with regard to the impact of environmental conditions. Greater realism may be achieved through field studies (see para 4.3.88 for example). Single-species laboratory tests (and nearly all laboratory tests are single-species) do not determine species interactions. Field study data give some indication of such interactions. This is the best information that is available for risk assessment and the approach taken by ERMA New Zealand is the conventional approach to such risk assessment.
Topic: Accident	
Issue # 83	*Risks from accidents are not highly improbable and it should not be assumed that the first people on the scene are likely to be trained personnel.*

ERMA Response	The application (para 4.3.115) states that the likelihood of accidents is highly improbable (which by ERMA New Zealand's definition, means almost certainly not occurring but cannot be ruled out). This should have said that the risks to human health from accidents during importation, transportation or storage are highly improbable, such risks being a consequence of the probability of the accident occurring and human exposure being sufficient to cause an effect. ERMA New Zealand maintains that the first response is likely to be from trained personnel, which the submitter says should not be assumed. ERMA New Zealand has only assumed it to be so in that it has said it is 'likely'.
Topic: New Zealand Incident Data	
Issue # 84	*Lack of incidents data does not necessarily mean lack of incidents.*
ERMA Response	ERMA New Zealand agrees that lack of incident data can either be due to a lack of incidents or a lack of reporting, and this is stated in para 4.2.8 of the application.

Section Three – Conclusions

3.1 The Authority's decision on the future use of endosulfan in New Zealand will be based on its consideration of:

- the application;
- all submissions and further information received since the application was publicly notified; and
- information provided at the hearing.

3.2 The Authority is required under the Act, to consider whether or not the positive effects (benefits) of using endosulfan outweigh the negative effects (risks and costs) of its use - after taking account of all safety precautions that might be imposed and the likely effects of the substance being unavailable.

3.3 If the benefits outweigh the risks and costs, the Authority may approve the continued use of endosulfan in New Zealand for some or all of its current uses (possibly with stricter controls or with further restrictions on use). If the benefits do not outweigh the risks or costs then the Authority may decide to prohibit endosulfan or some or all of its uses.

3.4 In the application, ERMA New Zealand noted that some uses (aerial, domestic and airblast application) were of particular concern and recommended they be prohibited. No additional information has been submitted which suggests that ERMA New Zealand's risk/benefit analysis was incorrect in this respect. Although no timeframe for prohibiting these uses was discussed in the application, ERMA New Zealand recommends that approval for these uses is revoked with either immediate effect or a very short phase out period. It is noted that this will effectively prohibit the use of endosulfan on citrus.

3.5 As regards other uses on other crops, ERMA New Zealand notes that a phase out over a period of time is an option open to the Authority and further notes Horticulture New Zealand's proposal for a phase out over a five year period. However, if the Authority does consider that the approvals should be phased out over time, ERMA New Zealand recommends that a tighter risk management regime (incorporating the controls set out in the table below) should be adopted during the phase out period.

3.6 In relation to use of endosulfan on turf, this is an 'off label' use and so there are no current set application rates. The recommendations in the application proposed a number of new controls to manage the risks associated with endosulfan use for turf management, namely limiting it to one annual treatment followed immediately by watering in, with a 48 hour "stand down" period in the case of use at "ground contact" sports fields and public parks where children may play. ERMA New Zealand notes the requirement in the Methodology (clause 35(b)) to invite comment on the "cost-effective" application of controls to achieve a specified level of risk management and that some submitters have indicated that these proposed controls may not be practical. In the light of these comments, ERMA New Zealand considers that there may be valid concerns about the practicality of these controls and notes that the Authority may conclude that these recommendations are no longer appropriate. If so, the Authority

may decide to prohibit use on turf outright or phase it out over a period of time. If it decides that the latter route is the most appropriate, ERMA New Zealand recommends that a tighter risk management regime incorporating the controls set out in the table below should be adopted during the phase out period.

3.7 In summary, should the Authority choose to allow the continued use of endosulfan then we would recommend that the controls set out in the table below be adopted. We also recommend that these controls should be adopted during any phase out period should the Authority choose to prohibit the substance.

Recommended controls		**Rationale**
Nature	**When**	
The following Restricted Entry Intervals (REIs) should be imposed for all uses, where personal protective equipment (PPE) is not used when re-entering: ➢ 48 hours for all crops or activities not listed below: • 3 days for sweetpotato; • 4 days for brassicas (broccoli, cabbage, cauliflower, brussels sprouts), mustard, radish, turnip; • 6 days for blueberries; • 17 days for sweetcorn; • 4 days for glasshouse use; • 10 days for "pick your own" activities (for members of the public).	Immediately	The REI values are based on a review of values applied in various overseas jurisdictions where endosulfan is still used (USA, Australia and Canada). The values have not been based on quantitative modelling using New Zealand label rates but by the application of the most relevant REI (which were from the USA). Some values have been lengthened slightly from what was initially proposed in the application to reflect US recommendations. Glasshouse REI based on the US EPA and Cal EPA values Members of the public may be more vulnerable than workers.
A 100 metre no-spray buffer zone will be required for all uses around waterbodies and the edges of treated crops	Immediately	High level of risks to the aquatic environment and to soil fauna. In the absence of evidence suggesting that a smaller buffer zone would be effective, ERMA New Zealand proposes a 100 metre buffer zone on the basis of overseas analyses of the effectiveness of buffer zones.
A maximum application rate for permitted turf use of 0.7 kg a.i/ha and one (1) application per season)	Immediately	ERMA New Zealand raised the possibility of reducing application rates or frequency in the application for reassessment in order to reduce operator human health and environmental risks. NZSTI advised that the 2.1 kg a.i./ha referred to in the application for turf is higher than is in

		fact the case and that the maximum rate should be 0.7 kg a.i./ha. This means that the excessive operator exposure risk from application on turf can be reduced to the extent necessary, although this still requires the use of full PPE during application. No submissions were received suggesting alternative application rates or frequencies for other uses. Since ERMA New Zealand has received no information on which to base changes to use patterns to reduce risks consistent with the efficacy of use and achieving of benefits, the original use patterns have been use in this assessment for other uses.
The following personal protective equipment (PPE) requirements should be stipulated on the label for different types of application and at different stages of the lifecycle (mixing/loading; application) and PPE should also be stipulated for re-entry prior to expiry of the relevant REI: • <u>Mixing/loading</u> Coveralls or long sleeved shirt and long pants Chemical resistant gloves, apron and footwear Protective eye wear (may be combined with respirator) Appropriate respiratory protection for spray mist* • <u>Application#</u> Coveralls or long sleeved shirt and long pants Chemical resistant gloves, apron and footwear Protective eye wear (may be combined with respirator) Appropriate respiratory protection for spray mist * * A combination mist/organic vapour respirator is required for operations involving Substance A and Substance D, due to the higher toxicity of the solvent in these formulations. # In the case of application using	Immediately	Operator exposure estimates have demonstrated that the health risk from mixing, loading and application of endosulfan are relatively high and only become acceptable for the operator using "full" PPE. Therefore it is recommended that the stated PPE be stipulated on the label.

an enclosed cab, the PPE needed for the driver during application may be varied appropriately. • <u>Early re-entry:</u> PPE should also be worn by people entering crops before the expiry of the relevant REI. (This will not apply to 'pick your own activities" for which no early entry is permitted.) The required PPE is: • Coveralls or long sleeved shirt and long pants; • Chemical resistant gloves, apron and footwear; • Protective eye wear (may be combined with respirator); • Appropriate respiratory protection for spray mist.* * A combination mist/organic vapour respirator is required for operations involving Substance A and Substance D, due to the higher toxicity of the solvent in these formulations.		

The following classification changes should be made: • for all formulations, replace 6.1C overall acute toxicity classification with 6.1A based on inhalation toxicity; • replace the current 6.3B classification on Substance D with a 6.3A classification; • remove the 6.8B classification applied to Thionex Insecticide Solvesso formulation; • replace the current 9.2C classification on endosulfan and all its formulations with a 9.2A classification.	Immediately	They are technically warranted and provide clearer information to users.
Assign an approval number to the Thionex Insecticide Solvesso formulation	Immediately	As set out in the application.
Change the packing group assigned to endosulfan and all formulations containing endosulfan from PG I to PG II.	Immediately	As set out in the application.

Appendix A – Summary of additional aquatic exposure modelling

Background

The application for reassessment of endosulfan was publicly notified on 27 June 2008. One of the areas of high risk identified by ERMA New Zealand during the preparation of this application was the potential for effects on aquatic biota. ERMA New Zealand flagged uncertainty about this conclusion because of the methods used to estimate the concentration of endosulfan in surface water. The methods and areas of uncertainty were:

- A Tier I analysis using the GENEEC2 model. This model estimates the concentration of endosulfan in a static water body 1 ha in size, 2 m deep, receiving the runoff and spray drift from a 10 ha area immediately adjacent to it. The GENEEC2 model is an intrinsically conservative model with uncertainty inherent in its output.
- Higher tier modelling performed by USEPA using the PRZM/EXAMS models (USEPA, 2007). This modelling used US use scenarios, US weather and soil characteristics.
- Higher tier modelling performed by Ramanarayanan et al (1999) and submitted by Makhteshim Chemical Works (MCW) using the PRZM/EXAMS models and application scenarios applicable to the US. These analyses differed from those of USEPA primarily in their use of lower estimates of spray drift.

The GENEEC2 modelling estimate of concentrations in the receiving water were similar to those of USEPA, but higher than those of Ramanarayanan et al (1999), although all analyses estimated risks requiring management. However, it was not apparent to what extent the PRZM output might have been affected by the use of US application scenarios. ERMA New Zealand therefore asked MCW to perform another PRZM/EXAMS analysis using inputs applicable to New Zealand. This work was contracted by MCW to AMEC Earth & Environmental and a report was received by ERMA New Zealand on 2 July 2008 (Schupner & Mackay, 2008).

The AMEC report did use New Zealand application scenarios, but did not use New Zealand soil and weather parameters. Consequently, ERMA New Zealand contracted HortResearch to evaluate the AMEC report and run another model, SPASMO, using New Zealand soil and weather data. SPASMO is a leaching model that was extended for this work by incorporation of the runoff routine within the CREAMS model. These models were run using New Zealand soil and weather information. A report on this work was received by ERMA New Zealand on 26 August 2008 (Müller et al, 2008).

The following comprises a summary of the reports from AMEC and HortResearch and comments on how these additional analyses affect the conclusions for aquatic risk reached by ERMA New Zealand in its application.

Schupner & Mackay (2008)

As with the USEPA (2007) and Ramanarayanan et al (1999) analyses, this is another application of the PRZM/EXAMS model estimating the concentration in a 1 ha, 2 m deep pond adjacent to a 10 ha field. The major difference in Schupner & Mackay's analysis is that use patterns reflect New Zealand application rates, frequency and scenario (ground boom)

and the analysis was performed assuming there was no no-spray (buffer) zone around the field. Drift was assumed to be 0.5% for each of the scenarios modelled.

Some of the inputs into this analysis used parameters applicable to the US, for example rainfall, and soil parameters and degradation rates. It is uncertain how relevant these are to New Zealand.

ERMA New Zealand has calculated summary statistics (minimum, maximum and average), from this report for citrus, for pasture and for the other crops combined (see Table 1 below). The results of this analysis show concentrations in the receiving water similar to those estimated by Ramanarayanan et al (1999). ERMA New Zealand notes that although the percentage drift used in Schupner & Mackay (2008) is higher than that used by Rananarayanan et al (1999), it is still lower than used by USEPA (2007) in their PRZM/EXAMS analysis or ERMA New Zealand in its Tier I GENEEC2 analysis. While it is not explicitly stated in Schupner & Mackay (2008), ERMA New Zealand assumes that the figure of 0.5% applies to drift as a percentage of the total amount applied to the 10 ha field, whereas the figure of 5% used by USEPA (2007) applies to drift as a percentage of the application rate. ERMA New Zealand notes that APVMA (2008) express drift as a fraction of the field rate. ERMA New Zealand also notes that it is not evident from Schupner & Mackay (2008) what values were input/derived for volatilisation and subsequent contamination of water bodies.

Müller et al (2008)

In this report, an integrated SPASMO/CREAMS model was used to estimate leaching and runoff from 6 crops (citrus, pasture (turf), boysenberry, onion, strawberry, potato), in 6 regions (Northland, Bay of Plenty, Waikato, Hawkes Bay, Manawatu, Canterbury) and 5 or 6 sites per region (representing a range of drainage and soil organic carbon content). The model assumes application to, and runoff from, a 1 ha area. Spray drift was assumed to be negligible. Climate data from 34 years of recording were used to estimate concentration probability distributions for leaching and runoff.

It was found that:

- Losses through leaching were minimal.
- The effect of region and soil type was comparatively minor.
- The effect of crop type had the greatest impact on runoff. The authors stress the importance of spray date in relation to the development of the crop, as crops develop and vegetation cover increases, runoff decreases.

ERMA New Zealand has calculated summary statistics (minimum, maximum and average), for citrus, for pasture and for the other crops combined (see Table 1 below).

The results of this analysis are not directly comparable to those of the other analyses, because the output is concentration in runoff (leaching losses were negligible) while the other analyses estimate concentrations in a receiving water taking account of fate processes in the water body. In addition, runoff from a 1 ha treated area is assumed, where the other analyses use runoff from a 10 ha area. To extrapolate from the losses in runoff to concentration in a receiving water can be done using a dilution factor; conventionally a factor of 10 is used. However, the Müller et al (2008) analyses show that although the concentration in runoff is relatively constant (varies by less than a factor of 10), the runoff volume varies between sites by a factor of approximately 700 and hence the total amount in runoff varies considerably.

Dilution in a receiving water is therefore likely to be very variable. In addition, dilution is only one factor reducing the concentration of endosulfan in a receiving water; other fate processes such as degradation and sorption will also have an impact.

The results of the Müller et al (2008) analysis indicate concentrations in runoff that are similar to those estimated in receiving waters by ERMA New Zealand using GENEEC2 and by the USEPA using PRZM/EXAMS. However, although dilution, sorption and degradation will lead to a lower concentration in receiving water compared to that in runoff, this cannot be taken as evidence that use of New Zealand specific parameters leads to lower concentrations in receiving waters, because the Müller et al (2008) analyses do not take account of other routes of input such as spray drift and volatilisation/redeposition.

Consequences for conclusions of high risk in the aquatic environment

ERMA New Zealand's conclusion on risks to the aquatic environment, as reported in the notified application, was that there is a high risk to aquatic organisms. The information received by ERMA New Zealand since notification provides additional modelling pertinent to freshwater exposure. No additional information has been received requiring a reconsideration of the aquatic toxicity of endosulfan.

ERMA New Zealand's conclusions are:

- Schupner & Mackay (2008) used New Zealand use scenarios, but US soil and weather data. The concentration in the receiving water from this analysis was similar to that estimated by Ramanararyanan et al (1999) which used the same model but input US use scenarios and US soil and weather data. ERMA New Zealand notes that spray drift of 0.5% was assumed in both these analyses and it is not clear what contribution volatilisation from soil and plant surfaces and redeposition in water makes to the aquatic concentration. On the basis of both Schupner & Mackay (2008) and Ramanarayanan et al (1999), ***ERMA New Zealand identifies a high risk to aquatic organisms and recommends that risk management is required***.
- Müller et al (2008) used New Zealand use scenarios and New Zealand soil and weather data. Their analysis only looked at input to a receiving water from runoff; fate in that receiving water was not modelled and drift and volatilisation/redeposition were assumed to be zero. The data show that the total endosulfan runoff varies greatly between sites, but making broad assumptions as to fate in receiving waters, spray drift and volatilisation/redeposition input, there is no evidence that use of New Zealand soil and weather data leads to a lesser concentration in receiving waters than is calculated by the other analyses. ***The conclusion of high aquatic risk is therefore unaffected by this new information***.

No additional information has been received by ERMA New Zealand relating regarding the extent to which buffer zones might reduce aquatic exposure. The conclusion reached in the application that buffer zones can reduce exposure, remains a truism. In the application, ERMA New Zealand proposed adoption of a buffer zone of 100 m based on overseas analysis of the effectiveness of buffer zones. ERMA New Zealand has no additional information by which to evaluate this proposal.

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Addendum to the Ecological Risk Assessment for Endosulfan. Memorandum to Special Review and Reregistration Branch. October 31.
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Table 1 Summary of modelling and conclusions

Model	Application scenario	Soil/ weather	Application				Buffer		Drift (%)	Runoff conc'n (µg/l)	EEC (µg/l)				Reference
			Equipment	Rate (kg a.i./ha)	#	Date	Runoff	Drift	Drift		Peak	21 day	60 day	90 day	
GENEEC2	NZ	Generic	Boom	0.7 (label)	4	-	None	None	1.2	-	13	8.9	4.8	3.4	ERMA application
				2.1 (turf)	1				0.8	-	10	6.7	3.6	2.6	
			Airblast	1.3 (citrus)	2		None	None	9.7	-	1.2	11	6	4.3	)
PRZM/ EXAMS	US	US	Aerial	1.1 (tomato, strawberry)	3	15, 22, 29 Sep	None	None	5	-	12	5.5	3.9		USEPA (2007
				1.1 (strawberry)		15, 22, 29 Jan					23	9.3	6.8		
PRZM/ EXAMS	US	US	Boom	1.1 (cantaloupe)	3	1 Apr, 8 May, 15 June	None	91 m	0.19	-	0.23	0.064	-	0.03	Ramanarayanan et al (1999)
				1.2 (cantaloupe)	1	1-Apr					0.15	0.013		0.003	
			Airblast	1.7 (apple)	1	1-May	None	31 m	0.03	-	0.33	0.08		0.033	
PRZM/ EXAMS	NZ	US	Boom	0.7 (potatoes, onions, strawberries, boysenberries)	1	5-Jan	None	None	0.5	-	Min 0.17 Max 0.51 Avg 0.36	Min 0.04 Max 0.22 Avg 0.14	Min 0.04 Max 0.21 Avg 0.13	Min 0.04 Max 0.21 Avg 0.13	Schupner & Mackay (2008)

Model	Application scenario	Soil/ weather	Application				Buffer		Drift (%)	Runoff conc'n (µg/l)	EEC (µg/l)				Reference
			Equipment	Rate (kg a.i./ha)	#	Date	Runoff	Drift	Drift		Peak	21 day	60 day	90 day	
					2	5, 15 Jan	None	None			Min 0.28 Max 1.0 Avg 0.72	Min 0.08 Max 0.42 Avg 0.26	Min 0.07 Max 0.41 Avg 0.26	Min 0.07 Max 0.41 Avg 0.26	
					4	5, 15, 25 Jan, 4 Feb	None	None			Min 0.44 Max 1.8 Avg 1.2	Min 0.13 Max 0.78 Avg 0.48	Min 0.12 Max 0.76 Avg 0.47	Min 0.12 Max 0.76 Avg 0.46	
			Airblast	1.3 (citrus)	1	5-Jan	None	None	0.5	-	0.26	0.022	0.018	0.017	
					2	5, 15 Jan	None	None	0.5	-	0.27	0.043	0.036	0.034	
			Boom	2.1 (turf)	1	5-Jan	None	None	0.5	-	0.42	0.04	0.034	0.032	
SPASMO	NZ	NZ	Not specified (but drift assumed to be negligible)	0.7 (Boysenberry, onion, strawberry, potato)	1	5-Jan	None	None	0	Min 4.1 Max 21.7 Avg 10.3	-	-	-	-	Mueller et al 2008
				2.1 (pasture)						Min 13.4 Max 23.1 Avg 17	-	-	-	-	
				1.3 (citrus)						Min 26.9 Max 43.9 Avg 34.8	-	-	-	-	

Appendix B – Preliminary recommendations included in the application

The recommendations set out below are preliminary only. An important part of the reassessment process is public submissions on the application. These public submissions are likely to have an effect on the final outcome of the reassessment.

On the basis of its evaluation of whether the risks associated with the use of endosulfan in New Zealand outweigh the benefits, ERMA New Zealand proposes the following preliminary recommendations to ensure that practices are safe for people and the environment:

1. That the use of endosulfan be prohibited for:
    - aerial and domestic use of the substance on the basis that these are not uses to which it is currently put (and the relevant risks have not been assessed as part of this application); and
    - airblast application for citrus on the basis that risks to operators and bystanders are currently assessed as very high.

2. That use on turf be restricted to one annual treatment, followed immediately by watering in, with no use of the treated area in the case of "ground contact" sports use and public parks where children may play, for a period of at least 48 hours following treatment (noting, however, that the operator exposures are high even with full PPE, so the feasibility of a lower application rate needs to be explored).
3. That the following Restricted Entry Intervals (REIs) be imposed for other uses, where PPE is not used when re-entering:
    - 48 hours for all crops not listed below;
    - 3 days for sweetpotato, mustard, radish, turnip;
    - 4 days for brassicas (broccoli, cabbage, cauliflower, brussels sprouts);
    - 6 days for blueberries;
    - 10 days for sweetcorn.

    In respect of the issue of REIs, ERMA New Zealand notes that:

    - although re-entry restrictions can be specified on New Zealand labels under HSNO regulations, the clearer, more prescriptive approach recommended above is in line with requirements introduced by overseas agencies;
    - consideration will need to be given to an appropriate REI for greenhouse use;
    - consideration will need to be given to longer REIs in the case of 'pick your own' berry orchards to take account of the exposure of pickers; and
    - REIs may not be necessary in respect of post-application turf maintenance activities (for example, mowing/rolling) unless the work involves direct exposure.
4. That a no-spray buffer zone around waterbodies and the edges of treated crops be introduced due to high level of risks to the aquatic environment and to soil fauna

(ERMA New Zealand currently considers a 100 m buffer zone may be appropriate on the basis of overseas' analyses of the effectiveness of buffer zones).

5. That reduced (maximum) application rates (kg a.i./ha per application/season) and/or limits on the number of applications (for example, per season) be introduced for some uses in order to lower the risks to the environment and people (noting the measures of this type proposed by some overseas agencies).

6. That suitable PPE be stipulated for different types of application and at different stages of the lifecycle (mixing/loading; application).

Finally, if the Authority's overall evaluation favours retention of some or all of the endosulfan approvals, ERMA New Zealand **recommends** the following classification changes:

- for all formulations, replace 6.1C overall acute toxicity classification with 6.1A based on inhalation toxicity;
- replace the current 6.3B classification on Substance D with a 6.3A classification;
- remove the 6.8B classification applied to Thionex Insecticide Solvesso formulation;
- replace the current 9.2C classification on endosulfan and all its formulations with a 9.2A classification;
- assign an approval number to the Thionex Insecticide Solvesso formulation;
- change the packing group assigned to endosulfan and all formulations containing endosulfan from PG I to PG II.

Appendix C – NGĀ KAIHAUTŪ TIKANGA TAIAO REPORT

NGĀ KAIHAUTŪ TIKANGA TAIAO REPORT

Application for Reassessment of a Hazardous Substance
under section 63 of the
Hazardous Substances and New Organisms Act 1996

Application Code: HRC07003

Name of substance: endosulfan and formulations containing endosulfan

13 September 2008

NGA KAIHAUTU TIKANGA TAIAO REPORT

Introduction

Kia ora koutou. My name is Glenice Paine. I am a currently the Tumuaki of Ngā Kaihautū Tikanga Taiao (Nga Kaihautu). I whakapapa to Te Atiawa and Ngai Tahu iwi. My background is in the resource management and conservation fields. I am here today to present a report on behalf of Ngā Kaihautū regarding the Chief Executive Initiated Reassessment of endosulfan and formulations containing endosulfan (HRC07003).

The role of Ngā Kaihautū is to provide advice and assistance, from a Māori perspective, to the Environmental Risk Management Authority (ERMA New Zealand). As part of that role, Ngā Kaihautū has considered this reassessment application under Section 63 of the Hazardous Substances and New Organisms Act (HSNO) 1996.

Nga Kaihautu supports and endorses ERMA New Zealand action in deciding to reassess endosulfan and formulations containing endosulfan. As a result of many interactions with iwi/Maori nationally, Nga Kaihautu is aware that there is a pervading view that iwi/Maori do not support, in most circumstances, the widespread use of poisons per se. Although this application has been publicly notified, it is understood that no specific iwi/Maori consultation has occurred in relation to this reassessment. Subsequently, as outlined in the Evaluation & Review (E&R) report, there is insufficient information on any benefits that may acrue to iwi/Maori through the continued use of endosulfan and its formulations. In the absence of good robust information on any benefits that are specific to iwi/Maori, Nga Kaihautu believes that the adverse effects to iwi/Maori outweigh any perceived benefits.

Accordingly, Nga Kaihautu would recommend that the use of endosulfan and formulations containing endosulfan should be prohibited. The adverse effects on people, the environment and native flora and fauna are set out in the E&R report, and from a Nga Kaihautu perspective, these adverse effects outweigh the stated benefits. If endosulfan (and formulations containing endosulfan) is not prohibited, then Nga Kaihautu would recommend an appropriate 'phase out' period. It is believed 3 – 5 years is reasonable.

RECOMMENDATIONS

Ngā Kaihautu

Recommends the use of endosulfan and formulations containing endosulfan should be prohibited in the first instance, or

The use of endosulfan and formulations containing endosulfan should be phased out over a period of 3 - 5 years.

Appendix D - Council Survey from NZ Sports Turf Institute Submission

SURVEY RESULTS ACCEPTABILITY OF PROPOSED CONTROLS FOR ENDOSULFAN				
Council	**100m buffer zone between waterways and treated area**	**48 hour closure period after spraying**	**Water in after application**	**Number of field treated with endosulfan**
Auckland	50m is more practical	Yes	Could be an issue on some grounds	0
Christchurch	100m	Yes	Yes	0
Dunedin	25m	Yes	Yes	2
Hamilton	50m is more practical	Yes	Yes	10-15 (approx)
Hauraki	50m is more practical	No (24 hours)	Could be an issue but will do that if required	2
Manukau	50m is more practical	Yes	Yes	Where a monitoring programme requires spraying 8 (approx)
Matamata Piako		Yes		2-4
Napier	50m is more practical	No (24 hours)	Yes	4-10
New Plymouth	20m is more practical	No (24 hours)	Could be an issue but will do that if required	24L (12 fields approx)
North Shore	100m	No (24 hours)	Yes	0
Palmerston North	20m	Yes	Yes	
Rotorua	50m is more practical	Yes	Yes	1
Taupo	100m	Yes	Yes	0
Timaru	100m	Yes	Yes	0
Waitaki	100m	Yes	Could be an issue but will do that if required	0
Wellington	20m	Yes	Yes	0.5 ha
Western Bay of Plenty	20m is more practical	Yes	Could be an issue but will do that if required	4-6
Whangarei	25m	Yes	Yes	2