Province of
British Columbia

Ministry of
Environment

ENVIRONMENTAL APPEAL BOARD
Victoria
British Columbia
V8V 1X5

Appeal No. 82-05 PES

J U D G E M E N T

PERMIT NO. - 123-20-82/83 and its amendment of January 11th, 1982. This permit was issued to B & W Agricultural Services Ltd. for the use of malathion 50 E.C. for mosquito control by aerial adulticiding in the Thompson-Nicola Regional District, Kamloops, Chase, Barriere and Logan Lake (2,000 ha per year).

APPEAL

The appeal was against the application by aerial adulticiding of malathion 50 E.C. for the following reasons:

1) The Thompson-Nicola Regional District has a large natural and domesticated honeybee population. Malathion 50 E.C. is toxic to bees of all types and the application of the pesticide will almost certainly cause lethal and sub-lethal effects on the honeybees, which will result in an adverse economic effect in the area involved for the following two reasons:

   a) A substantial amount of the province's honey comes from this region.

   b) The bees are required to pollinate the crops grown in the area, including those grown in the tree fruit orchards.

2) Aerial adulticiding with malathion is ineffective when comparison is made to larviciding with other chemicals. Also, larviciding has no effect on the honeybees.

HEARING INFORMATION

The hearing was held on April 22nd, 1982 in the Delta Canadian Inn in Kamloops, B.C.

.../2

The members of the Board in attendance were:

Mr. Frank Hillier, P. Eng. - Chairman
Mr. John O. Moore, B.Sc. - Member
Dr. Nicholas Schmitt, M.D. - Member

Miss Shirley Mitchell - Official Recorder

REGISTERED APPELLANTS

1) Mr. D.R. Cavers
Don's Gardens, Kamloops, B.C.

2) Mr. Ian Farber
President, Kamloops Division, B.C. Honey Producers Association

WITNESSES

For Mr. Cavers:

Mr. John Gregson, M.Sc. in Veterinary & Entomology Sciences

For Mr. Ian Farber:

Mr. Karl Rainer, farmer (Beef & Dairy Products)
Mr. Ted Kay, Provincial Bee Inspector, Ministry of Agriculture

LIST OF EXHIBITS

A - Submission of Mr. Ian Farber, with 15 appendices.

B - Submission of B & W Agricultural Services Ltd.

C - Minutes of a public meeting on June 18th, 1981, of the Thompson-Nicola Regional District.

D - Five letters to Mr. Cavers from local citizens supporting his cause in protesting against the application of malathion by aerial spraying.

.../3

SUMMARY OF APPELLANTS' PRESENTATIONS (In part)

Mr. Cavers

He said that he was not only a bee keeper, but was also involved in mixed farming such as dairy products, livestock and crops. Some of his comments in connection with the appeal were as follows:

1) The effect of the spray on honeybees was evident as much as 3½ miles outside the spray area.

2) Malathion was not only toxic to bees, but also to other pollinating insects.

3) In recent times there appeared to be a marked reduction of swallows in the area, and also perhaps other bird species. He attributed this fact to the detrimental effect of malathion from past spraying programs, particularly on the young birds.

4) He said that an application of broad spectrum agents such as aerial spraying with malathion was not efficient and also was not as effective as larviciding with other chemicals.

5) He said he had watched the drift of a chemical spray in a past application when there was no perceptible wind, and had noted that the chemical had travelled some one-third of a mile outside the spray area.

6) He said that in the past people in the spray areas had not been properly informed about the danger of malathion to leaf vegetables. He pointed out the malathion label said that leaf vegetables should not be harvested and eaten within seven days of being sprayed.

7) He said that from the letters he had received from some people who lived in past sprayed areas, that the pesticide was more of a problem than the mosquitoes. The pesticide application was only effective for a couple of days and then the mosquitoes migrated back from other areas.

.../4

8) He said that most of the bee hives in the region were located along the river bank and that it was his opinion that there were quite a few hundred hives in the designated spray areas.

9) He wondered how effective the spraying program would be if proper buffer zones for bee hives and fish bearing streams were a requirement of the permit (buffer zones for fish-bearing streams are part of the permit).

10) He had no objection to larviciding by the use of the pesticide "Abate". He said acceptable mosquito levels could be maintained by this method alone.

11) He stated that bees normally foraged up to a mile from the hive but on occasions could travel 3 to 3½ miles, depending on the conditions in the area.

Mr. Gregson

He said that he had previously been employed by Agriculture Canada at the Research Station in Kamloops, and had spent some 10 years of his life working on the mosquito control problems in the Thompson River area. He was also the previous author of the "Mosquito Control Guide". He had the following comments to make:

1) If mosquito control was done properly from the ground, then aerial adulticiding was not necessary. Adulticiding (presumably aerial) should only be done as a last resort.

2) He said mosquitoes only bring forth their young in standing water. He wondered why some of the areas in the permit which seemed to contain only moving water had been included in the spray program.

3) He said that if the Thompson River only floods its banks once during the spring freshet, it is not too serious as far as mosquito breeding is concerned. If the river, however, rises and falls several times during the spring and early summer a far worse condition is created.

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4) He noted that if the people in the area wanted good mosquito control, they should first look to their own back yards. Mosquitoes were probably breeding in tin cans, pools, etc. within their own property limits.

5) It was his opinion that the mosquitoes are not nearly as bad today as they were in the early days of 1932 to 1940, when he had been involved with the mosquito control program.

6) Mosquitoes can migrate into a treated area within a few days after the spraying from as far away as three miles, depending on the conditions in the area involved.

7) He suspected that malathion was detrimental to birds, but was not sure.

Mr. Farber

He stated that he was appearing before the Board not only for himself as an individual bee keeper, but as the representative of the Kamloops Division of the B.C. Honey Producers Association. He said the Division represented about 3,000 bee hives of which a great number were within the spray area. The hives were predominantly located along the river beds of the North and South Thompson Rivers. He said that he understood B & W Agricultural Services Ltd. had two permits, the one under appeal, and another for a ground control program. He said he had no problem with the ground control permit and in fact endorsed the program.

He provided two maps of the spray area showing the approximate location of the Division's bee hives. He said each hive would contain some 60,000 to 100,000 bees in the summer, which would therefore indicate a domestic bee population of some 240,000,000 bees for the area. It was also his opinion that the wild bee population may be almost as large. He said the value of the 1981 honey production for B.C. was $4,240,000 and that the value of crops pollinated by honeybees in the same year was $424,000,000. He further believed that up to 10% of the bees in the spray area would be killed by the malathion applications. The main points of his presentation were as follows:

1) Aerial adulticiding of mosquitoes was not an effective or recommended method of mosquito control. He supported

his evidence by quoting material from the following:

B.C. Mosquito Control Guide (Province), Planning an Anti Mosquito Campaign (Federal), and Dr. R.A. Ellis, City of Winnipeg Entomologist.

2) B & W Agricultural Services Ltd. from past performances had demonstrated that they cannot carry out an approved adult mosquito control program to the satisfaction of the Administrator of the Pesticide Control Act. Permit No. 123-15-81/83 was cancelled last year for two infractions.

3) B & W Agricultural Services Ltd. apparently does not have sufficient manpower or equipment to conduct an effective larviciding program and therefore makes use of the less costly aerial programs. In his opinion, Mr. Farber stated that the necessity for the aerial program may be because larviciding programs have not been done as effectively as possible in the past.

4) Aerial spraying of malathion is highly toxic to honeybees if applied to crops or plants in bloom (The Handbook for Pesticide Applicators and Pesticide Dispensers - Province).

5) Aerial application of malathion has been proved to be harmful to honeybee colonies. Six supporting documents from scientific journals and government bulletins or letters were presented to support this statement.

6) The proposed permit does not restrict spraying to specific times of the day.

7) The permit under consideration does not establish a buffer zone around apiaries. The Kamloops Division of the B.C. Honey Producers Association would be prepared to supply a map to B & W Agricultural Services Ltd. showing where the hives are located, and in fact, they have already done so. He stated that covering the hives was impractical and ineffective.

8) The allowable amount of malathion in this permit is above the amount supposedly required for an effective mosquito

.../7

control program. He supported this statement with an article from a scientific journal, which stated that 3 fl. oz. per acre of malathion was used in Texas to kill mosquitoes and contain an outbreak of encephalitis.

9) The permit does not provide for a mandatory warning to residents in the spray area to avoid eating crops sprayed with the chemical. According to instructions on the label of malathion containers, a waiting period after the application of the chemical should be observed.

Mr. Rainer

He stated that he was a farmer and had property located up on a side hill, presumably out of the mosquito area. He said that his property had been sprayed last year by B & W Agricultural Services Ltd. under the provisions of Permit No. 123-15-81/83 which had later been cancelled. He said he had not applied to have his property sprayed nor had he given permission to have it sprayed. The spraying took place around 7:00 a.m. The spraying was in the area of his house and barn and near his bee hives. His cattle were sprayed, including the food they were eating, and also his milking operations.

Mr. Ted Kay

He stated that he had taken a Bee Master's course at UBC and also that he had some 50 hives of his own. It was his job as a Provincial Bee Inspector to call on various bee keepers when they had problems with their bees or honey production, to see what was wrong. He said he had considerable experience with the results of pesticide application on bee colonies.

He stated that in a bee colony, within a hive, there are a number of positions in the organization. The young bees spend the first portion of their lives in the hive feeding the larva, providing air conditioning or cleaning the hive before they graduate to outside services. The first outside service they perform is in the providing of water for the hive and later may go on to foraging for nectar in the production of honey. It is these foraging bees that take the major abuse from pesticide applications. If they get

.../8

a direct hit from pesticides, in most cases they will be killed. If they come into contact with the pesticides on blossoms, etc., they become disorientated and probably will not make it back to the hive. If they do make it back to the hive and the pesticide is detected on them, they will be killed by the guard bees.

Because the total loss to a bee population from pesticides is difficult to determine, it is impossible to assess the damage which is being done to the hive. It is hard to estimate the total kill and it is therefore difficult to document the loss.

Other comments which Mr. Kay made were as follows:

1) Bees forage when the temperature reaches 12°C, so therefore, they may be out when its dark, either in the morning or in the evening.

2) Bee keepers cannot effectively protect the hives with tents or burlap covers during a spray program.

3) Toxic sprays take longer to deteriorate and become harmless in our colder northern climates then in warmer southern climates.

4) The bee keepers association in Kamloops did not seem to be aware of their losses from pesticide applications or to worry about them, judging from a conversation Mr. Kay had with members of the group some three years ago.

SUMMARY OF THE PRESENTATION OF THE PERMIT HOLDER (In part)

The following people appeared as representatives or witnesses for the permit holder:

Mr. Rob Dupree, B.Sc. - Spokesman and Technical Advisor for B & W Agricultural Services Ltd.

WITNESSES

Mr. Bill Hadath - General Manager of B & W Agricultural Services Ltd.

Dr. Bob Costello, Ph.D. - Biological Scientist, Ministry of Agriculture, Province of B.C.

Mr. Dupree

He said he had a B.Sc. degree in biology and a graduate degree in Pest Management.

In describing malathion he produced the following statement from a publication of Dr. Robert H. Giles:

> "Malathion appears to be an effective insecticide that, although harmful to some life forms, is of short residue and permits rapid recovery of decimated or altered population". (Wildlife Society 1970, #24 "The Ecology of a Small Forested Watershed Treated with the Insecticide Malathion S-35").

He next went on to answer the main points of Mr. Farber's testimony, which were as follows:

> Point 1 Re: Aerial adulticiding is not an effective method of mosquito control.
>
> The B.C. Mosquito Control Guide 78-14 page 5 states: "although a properly conducted larvicide program will reduce mosquito abundance in an area to a tolerable level, sometimes large numbers of adults migrate or are blown into a control zone. Also, under some circumstances a larvicide program is not practical, such as in isolated work camps, fishing lodges and cottages. Under these conditions, adulticiding may be necessary as a temporary relief measure."
>
> Kamloops has a unique problem that is not common to other areas when comparing mosquito control programs, in that two major rivers combine to form one river inside the city limits. The combined river flows to the west forming a large lake just outside city limits. At the east end of the lake (nearest to the city) a very large flood plain (approximately 450 acres) exists and has been set aside as a wild fowl sanctuary. The two rivers which flow from the north and east of Kamloops can and very often do become unruly in that they flood, recede and flood again throughout the summer season.
>
> As the flooding takes place, there are literally hundreds, and in some years thousands, of acres that become potential breeding

.../10

areas for mosquitoes. Many of the areas cannot be larvicided because of close proximity to fish bearing waters, and the chance of re-flooding. The flood plains near the lake are out of bounds to larviciding of any kind.

We (B & W Agricultural Services Ltd.) can easily see the problems involved even in a very comprehensive larviciding program if it is the only viable means of controlling mosquitoes. In an abnormally wet year (as was 1979 and 1981) there will be large acreages which cannot be treated because of the permit restrictions. Larviciding, however, will be quite satisfactory in a normal (dry) year as the acreage in question can be treated and only the larviciding program will be necessary to control the mosquitoes, as was the case in 1977, 1978, 1980.

B & W Agricultural Services mosquito control program concentrates on the following areas, with emphasis being given in descending order:

1) Elimination of breeding sites

2) Treatment with larvicides where #1 is not feasible

3) Treatment with adulticide only after #1 and #2 have been performed and only when required to kill migrating adults

Aerial adulticiding is not employed if it is not required. No aerial adulticiding was conducted in 1980 because adult mosquito populations remained at low levels.

Point 2 Re: Revoking of permit due to aerial spraying infractions.

B & W Agricultural Services Ltd. aerial application permit 123-15-81/83 was revoked on September 8, 1981; however, to state that this was due to incompetence is unjust. The circumstance which resulted in the revoking of the permit originated due to poor communication between the Ministry of the Environment (Penticton Branch) and the co-ordinator for B & W Agricultural Services Ltd. Although this admittedly is no excuse, a similar situation is unlikely to occur because B & W Agricultural Services Ltd. have increased their managerial staff and have no intention of allowing similar communication

.../11

gaps to prevail.

It should be noted that B & W Agricultural Services Ltd. have conducted a mosquito control program since 1969 and this is the first time they have been cited for a violation.

Point 3 Re: Lack of sufficient equipment and manpower employed by B & W Agricultural Services Ltd. in its mosquito control program.

Minutes of the public hearing, Thompson-Nicola Regional District July 9, 1981, gave no indication that our Mr. Wittner stated that B & W Agricultural Services Ltd. had insufficient manpower or equipment to undertake an extensive larviciding program.

Point 4 and 5 Re: Toxicity of malathion to honeybees.

Malathion is highly toxic to bees and would seriously affect honeybee populations in the sprayed areas. Unfortunately, malathion is the only insecticide registered for aerial application in a mosquito control program in B.C. Thus, if and when aerial adulticiding is deemed necessary by the proper authorities, every effort should be made to minimize the potential damage to bees and bee colonies.

This can be best achieved by:

1) Contacting Honeybee Producers Assn. 48-72 hours prior to an aerial spray.

2) Insure that location of honeybee colonies are availed.

Point 6 Re: Time of spraying.

Weather conditions restrict the time of spraying to the early morning hours. After this time, conditions are usually too windy, i.e. (13 kph) to permit aerial applications. Since bees only forage after the temperature rises above 12^{o}C, direct contact between bees and the insecticide would be minimal.

Point 7 Re: Establishing buffer zones around apiaries.

B & W Agricultural Services is willing to make a reasonable effort to respect buffer zones around apiaries, however, we

.../12

expect the B.C. Honey Producers Assn. to cooperate with our efforts and take whatever precautions they feel are necessary to minimize bee loss, when they have been notified that an aerial spray will be taking place.

Effective communication between both parties is the only way to achieve effective mosquito control and minimal bee loss.

Point 8 Re: Rate of application of malathion.

Although the maximum allowable rate of aerial application is 8 oz/acre (a.i.) good control can be achieved with an application rate of 3-4 oz/acre. A workable compromise resulting in effective control of mosquito population and minimal stress to honeybee colonies will result using the reduced application rate and avoiding honeybee colonies.

Point 9 Re: Mandatory warnings to avoid eating crops.

Any possible contact between produce and aerial spraying would result in residues well below the maximum allowable level. Proof of this statement is an example based on recommendations in the 1982 Ministry of Agriculture Home and Garden Production Guide.

Example: Recommended control for caterpillars and loopers on cole crops.

Malathion 50% E.C. at 3 ml/L of water. This is equivalent to ¼ oz/gal of a.i. and would be applied to a relatively small area of an average size garden - 300 sq. ft.

Compare this to 3-4 oz/acre a.i. or 43,560 sq. ft. These figures indicate that 9 times more malathion is applied to the home garden and requires a waiting period of 7 days.

Washing of fruit or vegetables prior to eating would remove any residue that could be associated with aerial spraying.

Dr. Costello

He had the following comments to make:

1) Comparison of Kamloops to Winnipeg

He said that he had been brought up in Winnipeg and had a good knowledge of the situation there. He had written his master's thesis on the "Ecology and Control of Mosquitoes in the Winnipeg Area". He said the breeding sites in the two areas were very different, particularly with regards to the rivers in the Kamloops area. It was his opinion that conditions were so different that they were not comparable. Winnipeg can have an effective program with laviciding only. Kamloops cannot.

2) Human Health Hazard

He said there was a potential human health hazard at Kamloops if the mosquitoes were not controlled. He was referring to encephalitis. The vector or species of mosquitoes exists in the area and the climatic conditions are appropriate for the incubation of the virus in the mosquito.

The last human case of encephalitis in the area was in 1972. There have also been some cases in horses in the mid seventies and other human cases in the south Okanagan. He suggested that the reason that there are not more cases reported is that perhaps the mosquito control program has been effective.

3) Mosquito Predators

He said mosquitoes have no predators which have a significant impact on their population. He said swallows are supposedly good mosquito predators, but indicated there is also scientific fact which disputes this information. He said swallows are also predators of bees. He also stated that he didn't believe malathion in the concentration involved in the permit would particularly hurt young birds.

4) Kamloops Program

He said it would be difficult, if not impossible, to have an effective mosquito control program in the Kamloops

.../14

area without adulticiding. The reasons for this fact are that the restrictions in the permit and the regulations dictate that no larviciding chemicals can be used in pools that are connected to or may be connected to fish bearing water.

Mr. Hadath

He had the following comments to make:

1) He had been directly involved in the mosquito control program in the Kamloops area for the last 12 years.

2) In that period of time there had been only one case (1977) where a bee hive had been directly sprayed, and he had immediately approached the bee keeper and offered compensation.

3) In that period of time, he was aware of no other complaints of damage to the hives of bee keepers nor had anyone come forward to make a claim.

4) He said that in 1980 the Thompson River never reached its flood crest and therefore no aerial adulticiding had been necessary. The control program was carried out completely by larviciding.

5) He said that in 1981 there was extensive flooding of the banks of the Thompson River and larviciding was not feasible or allowed by law. He, therefore, had to resort to extensive aerial adulticiding if there was to be reasonable mosquito control that year.

6) He said there are two kinds of mosquitoes which he defined as "snow pool" and "flood plain". If the river behaves, both types can be treated with larvicides. If the river does not behave, then adulticiding is the only way the "flood plain" mosquitoes can be controlled. If adulticiding did not take place, conditions in Kamloops would become intolerable and the population could expect up to as much

.../15

as 10 bites per minute if they were outside in their gardens, etc.

PRESENTATION OF THE PESTICIDE CONTROL BRANCH (In part)

The Pesticide Control Branch was represented by Mr. S.M. Craig, P. Ag., Manager of Pesticide Control for the Okanagan, Kootenay, Thompson-Nicola Regions. He was asked to appear before the Board by the Chairman to relate the Branch's experience with the contractor. His statement was as follows:

> B & W Agricultural Services Limited, 5000 Dairy Road, Kamloops, have held a valid Pest Control Service Licence since 1975. The categories of pest control services provided include:
>
> Agricultural Crop
> Forest and Forest Product
> Industrial Vegetation Control
> Landscape and Garden
> Mosquito and Biting Fly
> Structural Pest Control
> Product Fumigation
>
> The above categories of service are carried out throughout the Province of B.C. Our records indicate that B & W Agricultural Services have been involved in the ground and/or aerial application of pesticides for mosquito control for the following agencies:
>
> City of Prince George
> Northwood Pulp and Paper, Prince George
> Prince George Pulp and Paper
> City of Salmon Arm
> City of Kelowna
> Village of Sicamous
> Thompson-Nicola Regional District
> Town of Merritt
> Village of Cache Creek
> Village of Clinton
> Adams River Flats
> Little Shuswap Lease Holders

.../16

Inspections which have been made during the above pest control operations have resulted in one (1) violation of provincial regulations. This violation was a result of two contraventions of Pesticide Control Act Public Land Pesticide Use Permit #123-15-81/83 (use of Abate 2G, 4E, and Malathion 50 E.C. for mosquito control in the Thompson-Nicola Regional District, Kamloops, Chase, Barriere, and Logan Lake areas), and resulted in the permit being revoked on September 8, 1981.

Since May, 1979, seven (7) inspections have been made of the spray operations of B & W Agricultural Services Ltd. The only contraventions of provincial law which have been recorded during these inspections were minor ones related to pesticide storage and updating of Pest Control Service Operations Records. Both contraventions were promptly corrected prior to subsequent inspections.

In 1979, one (1) investigation was undertaken into a spray incident which occurred during an aerial application of herbicides for noxious weed control in the West Bench area near Penticton. As a result of this aerial spray program, numerous properties received visual damage to vegetable gardens, ornamental plants, and fruit trees. During the investigation of this incident, B & W Agricultural Services were ordered to discontinue their aerial application of herbicides in this Province; subsequent to this investigation, the above suspension of aerial herbicide spraying privileges was removed, and no further action was taken against the company.

QUESTIONS AND ANSWERS

The following are questions asked by the appellant, Mr. Farber:

Question: Who decides to spray? Is it the Thompson-Nicola Regional District or the contractor, B & W Agricultural Services?

Question: Is aerial application considered for mainly a public relations point of view or has it been effective in the past?

Question: Is a list of telephone calls kept to attempt to determine what the public requests with regard to either spray or not spray aerially?

.../17

The above questions were answered by B & W Agricultural Services Ltd. as follows:

1. Bite count conducted by a P.C.B. inspector is required before an aerial spray is undertaken. Thus it is P.C.B. which decides if an aerial spray is warranted.

2. Aerial application of malathion is not conducted for public relations reasons. In light of the recent controversy over the aerial application of pesticides, any business would be ill advised to use aerial spraying to enhance their public relations.

3. B & W Agricultural Services receives many calls throughout the duration of the mosquito control program. Some do not agree with chemical control of mosquito populations but the majority are concerned with high mosquito populations. They want action and the means of control is not a major concern.

In 1979 a radio program was conducted on the subject of mosquito control. An overwhelming majority wanted control.

CROSS-EXAMINATION

The following information came out of the cross-examination of the permit holder:

1) Because of the density of bee hives in the spray area it appears to be almost impossible for the spray to miss the hives completely or the forage areas of the bees.

2) B & W Agricultural Services Ltd. do not carry out the elimination of mosquito breeding sites. When they feel there is a need to eliminate specific sites they make recommendations only to their customers.

3) Aerial spraying is not done at night or during darkness because of the danger to both aircraft and aircrews from the possibility of hitting obstacles , such as trees, hills, rock outcropping, etc., in the area around the Thompson-Nicola region. Spray aircraft fly at some 20 feet about tree level.

.../18

4) Aerial adulticiding is the most expensive form of mosquito control. B & W Agricultural Services Ltd. prefer not to do it and only do so when they have no alternative. The state of river flooding decides whether it is necessary or not. Their contract is to control mosquitoes and they do it in the most economical way possible.

DECISION

The Environmental Appeal Board has considered all of the evidence submitted to it in the appeal hearing on Pesticide Control Permit No. 123-20-82/83, and its amendment of January 11th, 1982, issued by the Administrator of the Pesticide Control Act to B & W Agricultural Services Ltd. and has decided to dismiss the appeal.

The Board had difficulty in reaching this decision, as clearly there was an adverse effect to man and the environment in coming to a decision either way. It was a choice of evils, and unfortunately the evils were not evenly distributed over the population in the area, particularly with the decision to sustain the permit. The bee keepers must bear the brunt of the adverse effects.

In judging the case it appeared that there was a lesser adverse effect to the majority of the people in the area in sustaining the permit, and therefore the Board came to the conclusion that the application of the pesticide was not unreasonable.

The main reasons for the Board's decisions were as follows:

Medical

A potential hazard of Western Equine Encephalitis (WEE) definitely exists in the Kamloops area. Local wild and domestic bird populations are an important reservoir for the specific virus that causes this disease. The mosquito, culex tarsalis, which is abundant in the area, acquires the infection from birds and serves as an important vector of the disease to mammals including horses and humans. Equine outbreaks of WEE have been reported in the past from various areas in the central interior of British Columbia including the Kamloops-Nicola districts. In 1971/72 two human outbreaks of the disease were confirmed the first time in the adjoining Okanagan district, involving

.../19

10 persons and resulting in one death. Such epidemics usually occur in the late summer and are commonly limited to years with prolonged high temperatures and an abundance of mosquitoes. There is no specific treatment for this potentially fatal disease. It is not uncommon for victims of the disease to suffer brain damage which may be permanent. The only effective large-scale measures of preventing or aborting epidemics are fogging or spraying of stagnant pools and water bodies where mosquitoes breed,with larvicides, as well as ground and aerial spraying with adulticides. The Board does not consider larviciding alone a sufficiently effective measure of adequate mosquito abatement nor does the Board concede that ground spraying or fogging alone in the Kamloops area will effectively reduce mosquito densities.

Further, the Board cannot accept the claim that aerial spraying should be only implemented after WEE has actually occurred in humans. Such preventive action must be instituted well in advance of such a calamity.

The maintaining and testing of sentinel flocks of birds as well as the testing of mosquitoes for the infection would appear to be the most accurate or specific methods of predicting impending epidemics of WEE. However, until such methodology is implemented in British Columbia, mosquito bite counts may serve as indicators of increasing mosquito densities and the need for mosquito control by aerial spraying.

Damage to Bees

It was noted from the evidence that the mortality rate for bees in the area from the spraying program could rise as high as 10 percent. It was also noted from the evidence that until recently bee keepers were not aware of these losses, or if they were aware of the losses, were not sufficiently concerned about them to protest or make an appeal against a permit. If a loss of this magnitude does take place, the Board wonders why the effects have not been more pronounced. Do the bees have the ability to quickly regenerate their numbers again after being sprayed, or is a loss of 10 percent of the population not that significant, or are the losses as high as 10 percent?

The Board appreciates the concerns of bee keepers regarding the potential hazard posed by the aerial spraying with malathion to bees, but notes that the appellants were unable to provide proof of any bee kills that might have been attributed to past spray projects with this chemical. Nevertheless, the Board accepts the evidence that a potential hazard would appear to exist to bees from the aerial use of malathion.

The Board suggests that some provision can be taken to minimize the loss to the bee population during spraying programs, and also suggests that the benefits of the spraying program outweigh the adverse effects of not spraying.

Nuisance Problem

Mr. Hadath stated that if the adulticiding program did not take place and the river went through several floodings during the spring and early summer, the people in Kamloops and presumably in the other spray areas, may experience conditions which would become intolerable with mosquito bites rising to as much as 10 bites per minute. The Board believes that if conditions of this nature did develop, or even conditions where the bite count amounted to a half or even a tenth of this number, the situation would become almost unbearable.

The Board now directs that the following conditions also become part of the permit requirements:

1) The public will be notified of each treatment area to be sprayed 24 to 48 hours in advance of the spray program taking place by at least one spot radio announcement, preferably at the same time each day. All members of the public (bee keepers, crop growers and other residents) will be notified of the possible hazards and the precautions which should be taken in washing fruit and vegetables before eating. A written record of the times and dates of the spot announcements are to be kept.

2) Spraying of malathion should be restricted to times when bee activity is low.

3) Locations of apiaries be estblished so that any aerial spraying in such areas can be planned to minimize direct contact with bee hives.

F.A. Hillier, P. Eng.
Chairman
Environmental Appeal Board

May 12, 1982