



Appeal: 84/10 Pes

J U D G E M E N T

Permit No. 104-554-84/85, issued to the Minister of Forests for the use of Esteron 600 (a.i.=2,4-D Ester) for conifer release by helicopter, aerial broadcast spraying to 20 hectares of forest lands at Earle Creek - 5.5 km. S.E. of Egmont. Total quantity of active ingredient = 80 kg.

Appeal -

The grounds for the appeal were as follows:

- 1) An "ephemeral stream" is in existence on the site, yet the permit does not refer to the stream at all. The status of the stream and the measures to protect it must be clarified.
- 2) Conditions of the permit must protect specifically against the high potential for drift in the area. The appellants request several changes made to the permit to accomplish this protection.
- 3) The appellants are appealing against the use of an iso-octyl ester. Aerial applications in the Sechelt area should use the amine formulation.
- 4) The appellants wish clarification as to whether the permit will allow "a second herbicide application".
- 5) The appellants wish information on the practicability of alternate methods.

HEARING INFORMATION:

The hearing was held on August 14th, 1984, at the Driftwood Inn in Sechelt, B. C.

The members of the Board in attendance were:

|                              |   |          |
|------------------------------|---|----------|
| Mr. Frank Hillier, P. Eng.   | - | Chairman |
| Mr. Ian Hayward, P. Eng.     | - | Member   |
| Dr. William Godolphin, Ph.D. | - | Member   |

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| Miss Shirley Mitchell | - | Official Recorder |
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REGISTERED APPELLANTS:

The Registered Appellants were:

|                    |   |                   |
|--------------------|---|-------------------|
| Mr. W. E. Griffith | - | not in attendance |
| Mrs. Iris Griffith | - | Spokeswoman       |

Witness: Mr. John Dafoe

RESPONDENT:

The Respondent was the Minister of Forests, represented as follows:

|                       |   |  |
|-----------------------|---|--|
| Mr. Mel Scott, R.P.F. | - | Stand Tending Co-ordinator,<br>Vancouver Regional District |
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|                     |   |   |
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| Mr. William Wishlow | - | Forest Technician, Sechelt<br>Forest Office |
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LIST OF EXHIBITS:

- "A" The Effects of Pesticides on Fish & Wildlife, from the "Handbook for Fish Habitat Protection on Forest Lands in British Columbia (May 1981)" (one page).
- "B" Toxicity Values of Insecticides and Herbicides to Fish, from the "Handbook for Fish Habitat Protection on Forest Lands in British Columbia (May 1981)" (one page).

EXHIBITS (Continued)

- "C" B.C. Honeybee - Stock Improvement Project Seminars. Ministry of Agriculture and Food (two pages).
- "D" National Research Council - Canada (undated) 2,4-D - Some Current Issues.
- "E" Series of Photographs of the "ephemeral stream" showing water in the stream on August 6, 1984. Also, photographs of another stream on the south east side of the spray area, showing flowing water on the same date.
- "F" Letter to F.A. Hillier, Chairman, Environmental Appeal Board, from Mr. M. Scott, Stand Tending Co-ordinator, Ministry of Forests, dated August 14th, 1984.
- "G" Three photographs presented by the Forest Service, showing the Sechelt Inlet and the same two stream described by the appellants. No water was flowing in either stream when the photographs were taken on August 2nd, 1984.

SUMMARY OF THE APPELLANTS' PRESENTATION:

Mrs. Griffith's testimony was as follows:

- 1) She said that the appeal period was not sufficiently long enough in order for her to properly investigate the ramifications of the herbicide application, and adequately prepare her grounds for appeal. She recommended that a longer period of time be allowed.
- 2) She said that the general premise of her appeal was that both she and her husband did not approve of the making and use of a lethal chemical to do a job which could be done some other way. She said that 2,4-D should not be used just because it is cheaper, quicker and more pleasing to those who liked herbicides. She said that these short-term benefits do not outweigh the ethical, ecological and long-term economical disadvantages.

- 3) She then quoted, as follows, from a paper entitled "The Effects of Pesticides on Fish and Wildlife (Exhibit "A"):-

A recent study (Pearse Bowden 1972) indicates that the direct benefit to British Columbia from the various uses of fish and wildlife amounts to approximately \$110 million annually, with an estimated \$213 million being spent each year on fish and wildlife related recreation. Some people will contend that our fish and wildlife resource is 'priceless'. However, its price, in economists terms, is also well worth protecting. In order to maintain this valuable resource it is vital that not only animals in an individual sense be protected, but also that animal habitat be protected. Therefore, protection from the adverse effects of pesticides is essential.

The amounts and the variety of pesticides used have increased tremendously in the last decade. This increase has had a positive affect on crop production and public health; however, certain pesticides, their residues, metabolics and/or contaminants, have created many unforeseen adverse effects on the environment. Acute mortality has been well documented.

Many biologists feel that the majority of fish and wildlife mortalities either go unnoticed or are not documented.

In addition to the concern for the obvious fish and wildlife mortalities, there has been a growing awareness of the long term effects of low levels of pesticides on ecosystems. These small amounts of pesticides are more subtle in their effects on the environment and can cause long-term chronic damage, which is more difficult to define than short-term (acute) toxicity.

Another stress that may be considered indirect is alteration in the physical habitat and/or breakdown of existing food chains.

An example of this damage is the removal of streamside vegetation which can mean a loss in shade cover resulting in increased water temperatures and probably detrimental effects on fish population.



- 4) From Exhibit "B", Toxicity Values of Insecticides and Herbicides to Fish, she quoted the following information to illustrate that 2,4-D was toxic to fish and birds:

|                              | <u>Exposure time (hrs)</u> |    | <u>LC/50 (mg/l)</u> |
|------------------------------|----------------------------|----|---------------------|
| a) Toxicity of 2,4-D to fish | Salmon                     | 96 | 6.4 - 135           |
|                              | Trout                      | 48 | 1.4 - 250           |

- b) There is little information on the sublethal effects of herbicides on birds. However, there are indications, again from laboratory studies, that detrimental effects are likely.

High dose rates of 2,4-D were found to totally depress reproduction in mallards.

- 5) She noted that the toxicity to honeybees was above 18 mg/liter (L.D./50) and she also said that she was a beekeeper. She noted that a new industry for the Sunshine Coast was about to get started which was the raising of honeybees for sale to other parts of Canada. She introduced a witness, Mr. Dafoe, to speak on the subject.

Mr. Dafoe's testimony was as follows:

- a) He said that he was also a beekeeper.
- b) He said that he was interested in this project (Exhibit "C") although he was just getting started, just on the edge of it, just getting involved.
- c) He said that the coast of British Columbia was ideally suited to the raising of honeybees, more so than the production of honey.
- d) He said that he knew that pesticides were detrimental to the well-being of bee populations and did not wish to see the project damaged because of herbicide applications in the area.
- 6) Mrs. Griffith then put into evidence a National Research Council paper which the Administrator of the Pesticide Control Act had sent to her (Exhibit "D"), and which indicated the properties of 2,4-D which are still unknown, particularly if the 2,4-D is contaminated with dioxins. These properties are as follows:

- a) The connection between adverse reproduction effects and dioxin contaminants in 2,4-D.
  - b) The cause of neurological complaints in workers exposed to 2,4-D.
  - c) The exposure to bystanders from aerial application of 2,4-D.
  - d) The strength of the association between 2,4-D and disease.
- 7) Mrs. Griffith then introduced a series of photographs into evidence, which were taken on August 6th, 1984, after a heavy rainfall. These photographs showed water flowing ankle-deep in the "ephemeral stream" at the centre of the herbicide application site. She also noted that another streambed was in existence at the eastern end of the application site which also had running water flowing in it on the same date. She said that these streams were obviously of most concern to her. Further, she noted from the Herbicide Handbook of the Weed Sciences Society of America, that the average persistence of the toxicity of 2,4-D was from one to four weeks in warm moist soil. For the ester formulation, she was unsure of the period, but knew that it was at least a week.
- 8) Mrs. Griffith noted that from the inspector's comments from Environment Canada, that depending on the weather conditions, the potential for drift in the Sechelt area was quite high. She also noted that the inspector suggested that a drift control agent should be included in the mixture to reduce drift if conventional spray boom nozzles were to be used, and that the applicant should investigate the possibility of using a micro-foil boom. She said she would also like to see the drift recorded on the actual day the herbicide application was made.
- 9) Mrs. Griffith objected to the use of the ester formulation of 2,4-D because of its greater potential for drift and its higher toxicity to fish.

- 10) Mrs. Griffith also asked for clarification on the possibility of a re-application of the herbicide in connection with this specific permit.
- 11) Mrs. Griffith said that the last time 2,4-D was used in the area for aerial spraying, the mixing and loading of the helicopter was on a hillside above North Lake, which is on the west side of Skookumchuck Narrows above a residential area. She noted that the applicator at the time was conscientious and no spills occurred. However, the residents below the mixing and loading site were uneasy in that if a spill had occurred, it could have washed down the hill and into their water supply systems. She said that before mixing and loading of the herbicide took place this time, the people in the area would like a proper location to be selected where no possible contamination of their properties could take place if a spill did occur. She asked that the mixing and loading location be posted on the community notice board at Egmont at least one week before the herbicide application took place.
- 12) In closing her testimony, Mrs. Griffith again objected to the use of herbicides in the forests of British Columbia, and said that she believed the necessary work should be done by manual clearing, even if it did cost more money.

COMMENTS MADE DURING THE CROSS EXAMINATION OF THE APPELLANT:

- 1) Mr. Dafoe said that he wasn't involved in the B.C. Honeybee Stock Improvement Project as yet, but hoped to be very shortly.
- 2) Mr. Dafoe also said that he does not at present keep any bees on the side of the Narrows where the spray application will take place, but thought that Mrs. Griffith's bees probably frequented the area on occasions.
- 3) Mrs. Griffith said that initially she had difficulty in getting information on the pesticide application in question from the Pesticide Control Branch. She said that she got the "run-around" and eventually had to go to the Ombudsman. She also noted that the Pesticide Review Committee was not too co-operative.



SUMMARY OF THE RESPONDENT'S PRESENTATION

Mel Scott's testimony was as follows in regard to the answering of the Appellant's concerns:

1. Protection of waterbodies and wetland areas. Section 4 of the permit requires that spray may not be directed within 10 meters of waterbodies and wetlands.
2. This area is typical of mountainous terrain on the coast of British Columbia. Aerial spraying of this site presents usual concerns.
3. Esteron 600 is an iso-octyl ester formulation of 2,4-D which is registered, P.C.P. No. 15981, for use by aerial application. The iso-octyl ester formulations of 2,4-D are less volatile than numerous other ester formulations. A temporary registration of 2,4-D amine for aerial application exists and the Ministry of Forests is co-operating in trials to compare the efficacy of the ester and amine formulations of 2,4-D.
4. It is intended that only one spray be carried out under this permit using the total quantity allowed.
5. The Ministry of Forests attempts to manage each area on a site-specific basis in the most effective manner. Labour costs experienced on forestry projects near this site indicate that ground treatments of this stand would be more expensive than an aerial spray.
6. There is nothing unusual about this site as far as drift is concerned. The Forest Service has sprayed many other sites in this area by aerial spraying and has experienced no unusual drift problems.
7. The nearest microfoil boom which may be available is in Alberta. Microfoil booms require much higher volumes of the herbicide mixture and are therefore more expensive to use than conventional booms. The total active ingredient is, however, the same.
8. Aerial amine application of 2,4-D requires more 2,4-D to accomplish the same results, as could be obtained using the ester.



- 9) The weed trees in the herbicide application area are now fairly large and may not be killed with one application of 2,4-D. However, before a second application could be made, the Forest Service would have to apply for and obtain a new permit.
- 10) From the Handbook for Pesticide Applicators, Page 126, Mr. Scott said that routine applications of 2,4-D are not hazardous to bees.

Mr. Bill Wishlow's testimony was as follows:

- 1) He presented a series of slides, identified the herbicide area on maps and discussed the local specifics of the site.
- 2) He presented three photographs showing Sechelt Inlet and the two stream beds on the site as they were on August 2, 1984. No water was flowing in either stream.
- 3) He said the site had a grade of 50 to 60 percent.
- 4) He noted that the ocean was approximately 2 kilometers from the site and so was the Gordondale Logging camp. Loggers living in this camp were the only residents in the area.
- 5) He identified the two streams or creeks in the Appellants' presentation as to location. He noted that on August 2nd, 1984, both creeks were totally dry. He did say, however, that there was a little water in the most easterly creek culvert, but that this water came from a ditch alongside of the road, and not from the creek. The creek bed was a "dry wash".
- 6) He said that the area involved had been logged in 1967-68 and replanted again with Douglas Fir in 1974. The current situation was that the area was very thickly overgrown with cherry and alder. He said that there were presently approximately 8900 deciduous stems on the site overtopping and competing with the Douglas Fir for sunlight, growing space and nutrients. In addition to this problem, the cherry trees seemed to thrash around in the wind, breaking branches off of the Douglas Fir, which retarded the growth of the trees and deformed the trees, which, in turn, would result in lower lumber recovery when the trees were harvested in the future.

harvested in the future.

- 7) He said that in his investigation of the site, he had found that the whole area was covered in rotting slash which made it impractical and dangerous to manually cut down the deciduous trees or use a ground spray herbicide application.

COMMENTS MADE DURING THE CROSS-EXAMINATION OF THE RESPONDENT:

- 1) When Mr. Scott was questioned on the differential in costs between aerial spraying, "hack and squirt" and manual removal of the deciduous trees, his comments were as follows:
  - a) He said the cost of the aerial spray program was about \$150 per hectare, or about \$3,000 for the whole 20 hectares. Further, he said that there was not a high probability that retreatment would be required, but if it was, it would cost about the same and would be done after evaluation of the first treatment in about two years.
  - b) He said that "hack and squirt" was not practical because the deciduous trees were not large enough and that the slash problem created dangers to the applicators. He also said that "hack and squirt" costs about four times the amount of aerial spraying, or about \$662 per hectare.
  - c) He said that he could never get a bid for manual removal of the deciduous trees that was less than the cost of helicopter spraying. There was also another problem of evaluation or assessing the results of the manual removal, and a contract of this nature would have to include retreatment of the trees to a free growing state for the conifers, if it was to have any credibility.
- 2) Mr. Scott said that for hand treatment to be effective and somewhere equal to aerial spraying in cost, the following conditions were necessary:
  - a) Few stems
  - b) Only one treatment
  - c) No slash on the ground

- 3) Mr. Scott also said that once the deciduous trees had been treated, there was no need to cut them down. They would gradually decay and fall naturally in about 5 years.
- 4) Mr. Scott said that there was no market in the Sechelt area for the deciduous trees, whether small or large. The present trees were too small and the cherrywood was the wrong type. Secondly, if the deciduous trees were allowed to grow, the marketing of these trees would be uneconomic because of the limited access to the area.
- 5) In connection with drift, Mr. Scott said that spray areas the Forest Service had done in the past were comparable with the one in question. He said that environmental agents had checked the previously sprayed areas and found that the drift had caused no problems. He said that the Forest Service would probably take some drift tests on this application, but made no promises.
- 6) Mr. Scott said that the 10-meter pesticide free zone areas for stream and water bodies were measured horizontally.
- 7) Mr. Wishlow said that he would not have sprayed on August 2nd, 1984, even if it had been allowed, and even though the streams were dry, because the soil in the area was too moist and the conifers were not ready. The leaders on the fir trees were still drooping and buds had not formed a sharp tip. Under these conditions, the conifers would have been damaged as well as the deciduous trees.
- 8) Mr. Scott said that on this site, it was impractical to consider hack and squirt, or manual removal of the deciduous trees.
- 9) Mr. Scott said that the Forest Service only had temporary registration which allowed the use of the amine formulation of 2,4-D for experimental aerial spraying. He said that the ester formulation was much more effective. He said that the reports he had had in connection with the amine formulation indicated that 4 to 6 times the amount of 2,4-D was required to gain the same results as that obtained by the ester formulation.



- 10) Mr. Scott said that the Forest Service intended to spray the site in question in late August or early September. He also said that if the right conditions were not present at that time, the Forest Service would not spray this year at all.
- 11) Mr. Scott said that the spray concentration the Forest Service intended to use on this site was about 4 times the concentration of "Weed and Feed", which was one percent.
- 12) The nearest residents to the spray area were about 2 kilometers away, with perhaps the exception of one man who lived at the base of Emerson Creek.
- 13) Mr. Scott said that nobody's water supply came off the property. The nearest residents were at the logging camp, with the possible exception of the man mentioned above, and the logging camp obtained its water supply directly behind the camp.
- 14) Mr. Scott said that if the two streams described by Mrs. Griffith were active at the time the Forest Service intended to spray, there would be no spraying this year.

DECISION:

The Environmental Appeal Board has considered all of the evidence submitted to it at the appeal hearing on Pesticide Use Permit No. 104-554-84/85, issued to the Minister of Forests for conifer release by the Administrator of the Pesticide Control Act, and has decided that the implementation of the program will not cause an unreasonable adverse effect to mankind and/or the environment.

The appeal is, therefore, dismissed.

COMMENTS OF THE BOARD:

- 1) The Board believes that the Forest Service should post a notification on the community notice board at Egmont one week before the spray program commences, as to the location of the mixing and loading site.

- 2) The Board notes that the two streams which the Appellants brought to the attention of the Board are not much more than storm ditches. There was no evidence presented that either stream contained fish life. Therefore, no fresh water fish will be damaged by the application of the 2,4-D on the site, even if 2,4-D was to get into the streams in minor concentrations.
- 3) Any 2,4-D which was carried down the streams to the ocean would be in such low concentrations as to have no effect on fish life in the sea whatsoever.
- 4) Animals and birds tend to avoid areas which have been treated with 2,4-D. The concentrations of 2,4-D in the area would, therefore, have little or no effect on wildlife, including birds.
- 5) From the evidence, it is difficult to see how this herbicide application could have any detrimental effect on bees or on the Stock Improvement Project.
- 6) Since no human beings live on the site or relatively near to the site, and since no potable water supplies come from the site, it will not be possible for the herbicide application to cause any adverse effects to human water supplies.



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

Victoria, B. C.  
August 17, 1984