1012.1

(5)

EEE BRANCH REVIEW

DATE: IN 4/25/78 OUT 8/30/78; IN _____ OUT _____; IN _____ OUT _____

FISH & WILDLIFE ENVIRONMENTAL CHEMISTRY EFFICACY

FILE OR REG. NO. 3125-280

PETITION OR EXP. PERMIT NO. N/A

DATE DIV. RECEIVED 3-27-78

DATE OF SUBMISSION 3-13-78

DATE SUBMISSION ACCEPTED N/A

TYPE PRODUCT(S): (I) D, H, F, N, R, S Insecticide

PRODUCT MGR. NO. F. Gee (16)

PRODUCT NAME(S) MONITOR 4

COMPANY NAME Mobay Chemical Company

SUBMISSION PURPOSE Registration of new use pattern - POTATOES

CHEMICAL & FORMULATION MONITOR(R) 4:
O,S-Dimethyl phosphoramidothioate. . . 40%

ECOLOGICAL EFFECTS BRANCH REVIEW

100.0 Pesticidal Use

CROP	INSECT	DOSAGE - PINTS MONITOR 4	REMARKS
			Injection into sprinkler irrigation systems. Use only in solid set systems equipped with automatic shutoff devices and valves to prevent backflow into the water source. Do not apply when wind velocities exceed 10 mph.
Potatoes (Washington, Oregon, Idaho, Utah and Northern California)	Green Peach Aphid	1-1/2 to 2	Solid set systems. Apply specified dosage for the entire length of the irrigation period or for a 30 to 60 minute period at the end of a regular irrigation set or as a 30 to 60 minute injection as a separate application not associated with a regular irrigation. Allow time for all lines to flush the pesticide through all nozzles before turning off irrigation water. Allow foliage to dry thoroughly before entering field. To ensure the lines are flushed and free of remaining pesticide, a dye indicator may be injected into the lines to mark the end of the application period.

101.0 Chemical and Physical Properties

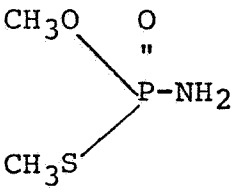
101.1 Chemical Name

O,S-Dimethyl phosphoramidothioate

101.2 Common Name

METHAMIDOPHOS

101.3 Structural Formula:



$C_2H_8NO_2PS$

101.4 Molecular Weight: 141.13

101.5 Physical State: Pungent odor.

101.6 Solubility:

Infinitely miscible with water and alcohol; less than 1% in kerosene; less than 10% in benzene or xylene.

101.7 Volatility: Low

101.8 Vapor Pressure: Approx. 10^{-4} mm Hg at 20° C.

101.9 Density: 1.31 (melt)

101.10 Melting Point: 39-41° C.

102.0 Behavior in the Environment

102.1 Soil

102.1.1 Persistence:

SOIL TYPE	½-LIFE (DAYS)
Silt	1.9
Loam	4.8
Sandy	6.1

102.1.2 Degradation:

Major route of degradation in soil appears to be biological. MONITOR is not retained by soil particles.

102.2 Water

102.2.1 Hydrolysis:

pH	½-LIFE (25° C)	½-Life(37° C)
1.5	--	16 hours
2	--	5.6 days
3-8	--	Stable for 2 weeks
7	--	Stable for 1 month
9	2-6 days	1.5 days

102.2.2 Leaching

MONITOR does leach but degrades rapidly while leaching.

102.3 Plant

102.3.1 Metabolism/Uptake:

Metabolic pathway is strictly hydrolytic. When applied to soil MONITOR readily moves throughout the whole plant via root system. When applied to leaves, it translocates only with the transpiration stream towards the margins of treated leaves (apoplastic translocation). No translocation

occurs out of the treated leaves via the phloem into the stem or other leaves.

102.4 Animal

102.4.1 Bass were exposed to 0.01 ppm for 8 days. Residues in fish were less than 0.02 ppm.

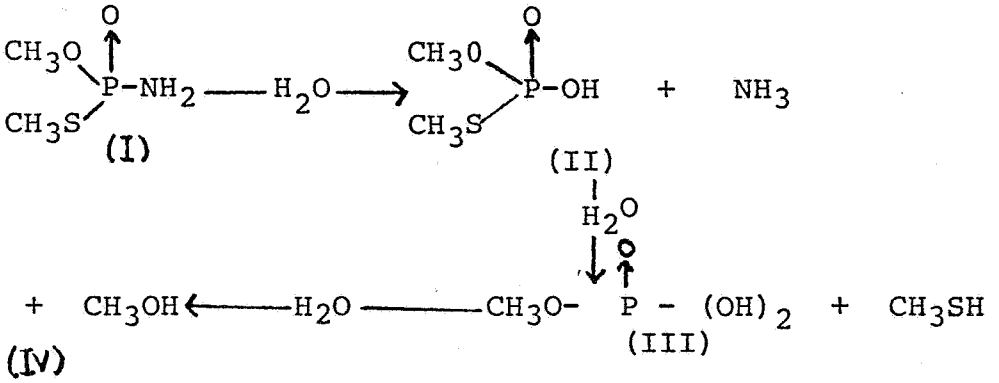
102.4.2 Bass were exposed to 1 ppm for 28 days and were put into a newly fortified tank every 7 days. Results:

Days in H_2O	Net Residues in fish ppm		ppm in H_2O
Control	.014	0 days	0,75 - 1.63
7	.049		1.0 - 1.07
14	.050		1.5 - 1.07
21	.048		1.38 - 1.03
28	.072		0.92 - 1.06
1 day withdrawal	.014		
14	.014		
21	.014		

The above two studies indicate no accumulation of MONITOR accurred.

102.5 Hydrolytic Pathway

The hydrolytic pathway for MONITOR in plants, rats, and soil is:



102.6 Summary

The above information was obtained from Environmental Chemistry files via a visit to the Crystal City office on 8/18/78 in the afternoon.

103.1 Mammalian Toxicity

Species	Test	Results	Test Material
Rat	Acute Oral LD_{50}	LD_{50}:M 17.8(12.6-25)mg/kg LD_{50}:F: 20.0(13.4-29.8)mg/kg	Assume MONITOR 4
Rabbit	Acute Dermal	LD_{50}:285.6(188-432)mg/kg	Assume MONITOR 4
Leghorn Hens	Neuro-Toxicity	Acute Oral LD_{50} 27.5(22.5-33.6)mg/kg	75% MONITOR
Rat	Acute Oral	LD_{50}:M: 21.0 mg/kg(16.3-27.1) LD_{50}:F: 18.9(17.2-20.8)mg/kg	75% MONITOR
Rabbit	Acute Dermal	LD_{50}: 118(97.5-143)mg/kg	Assume 95% Tech.
Rat	Acute Oral	Male LD_{50}: 15.6 mg/kg. Female LD_{50}: 13.0 mg/kg	95% Tech.
Rat	90-Day Feeding	NEL: 0.3-1.0 ppm (Erythrocyte-ChE)(No deaths at 10 ppm*)	75% Tech. 75% Tech.
Rat	2-year Feeding	NEL: 10 ppm (40/64 animals died during 2 years at 30 ppm* but these deaths were attributed to "natural" causes.)	97% Tech.
Rat	3-generation Reproduction	NEL: 10 ppm (Little mortality at 30 ppm* in Parents) (3/24)	75% Tech.

* Highest concentration tested.

103.0 ...

103.1...cont,

The above mammalian data were taken from Toxicology Branch's MONITOR File (File No. 378A). Many of the studies listed have not been validated.

103.2 Ecological Effects Branch Toxicology Data

See attached Validation Reviews and Data Summary Sheet.

104.0 Hazard Assessment

104.1 Discussion

The present submission of MONITOR(R) 4 Liquid Insecticide concerns the proposed use of MONITOR at 1.5 to 2 pts/A or 0.75 to 1.0 lb. a.i./A on potatoes. The pesticide is presently registered at these rates for use on potatoes, but this use recommends injection of the pesticide into sprinkler irrigation systems for control of Green Peach Aphid. The proposed area of use concerns only the Northwest U.S.: Washington, Oregon, Idaho, Utah, and Northern California.

The number of areas in potatoes in these states is broken down as follows:

State	Acreage in potatoes*
Washington	92,474
Oregon	148,977
Idaho	315,921
Utah	4,444
California(total state)	60,444
Total Acreage	622,260

*1974 Census of Agriculture

The number of applications of pesticide is not given, but it is assumed that as many applications as are registered already for potatoes can be made. (Present registration calls for application of 0.75 to 1.0 lb. a.i./A on a 7 to 10-day preventative program or as necessary.) Therefore, repeated applications of this pesticide via irrigation water cannot be ruled out.

104.2 Likelihood of Exposure to Nontarget Organisms

104.2.1 Residues

The proposed use provides for the following maximum expected residues:

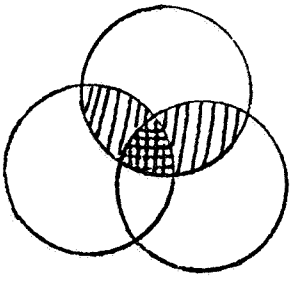
VEGETATION TYPE/ INSECT/SOIL SURFACE	RESIDUES EXPECTED FROM 1.0 LB. A.I/A
Sparse Foliage (short grasses)	240 ppm
Long grasses	110 ppm
Leafy situations	125 ppm
Dense Foliage/small insects	58 ppm
Pods/seeds/large insects	10-12 ppm
Fruits	7 ppm
Soil (0.1 inch)	22 ppm

These residues are based upon the articles of Kenaga (1973) and Hoerger and Kenaga (1972). However, it is pointed out that: (a) these are maximum expected residues and (b) these residues were derived from the residue patterns of spray formulations (as opposed to granular and dust formulations). Therefore, relative to potatoes and insects in/around the target area, the residues above of 10-12 ppm, 58 ppm, and 125 ppm may not be appropriate. This is especially true since the pesticide will be injected into approximately 27,152 gallons of water*, whereas, Kenaga's and Hoerger's residues were developed from conventional ground/aerial spray application volumes.

*Based upon information which indicates that irrigation of land generally involves application of 1" of water to each

Relative to repeated applications, it is not known how often applications by injection into irrigation water will be made (one source indicates 3-4X). The reviewer assumes that as many applications as are made via conventional (ground/aerial) equipment can be made, but irrigation/insect infestation will depend upon local weather/insect population conditions.

One other point relative to residues is worthy of mention: that is the propensity for misapplication of the pesticide to the treated area. Due to application equipment and applicator misjudgement overlapping of applications will occur, for basically, where more water is applied, more pesticide is applied. Consequently, "hot spots" in treated fields will occur, and 2x to 3x the recommended amount will occur in these areas. A diagram of these overlaps is below:



//// : 2x application

: 3x application

In conclusion, since it is difficult at best to determine the maximum expected residues, the re-

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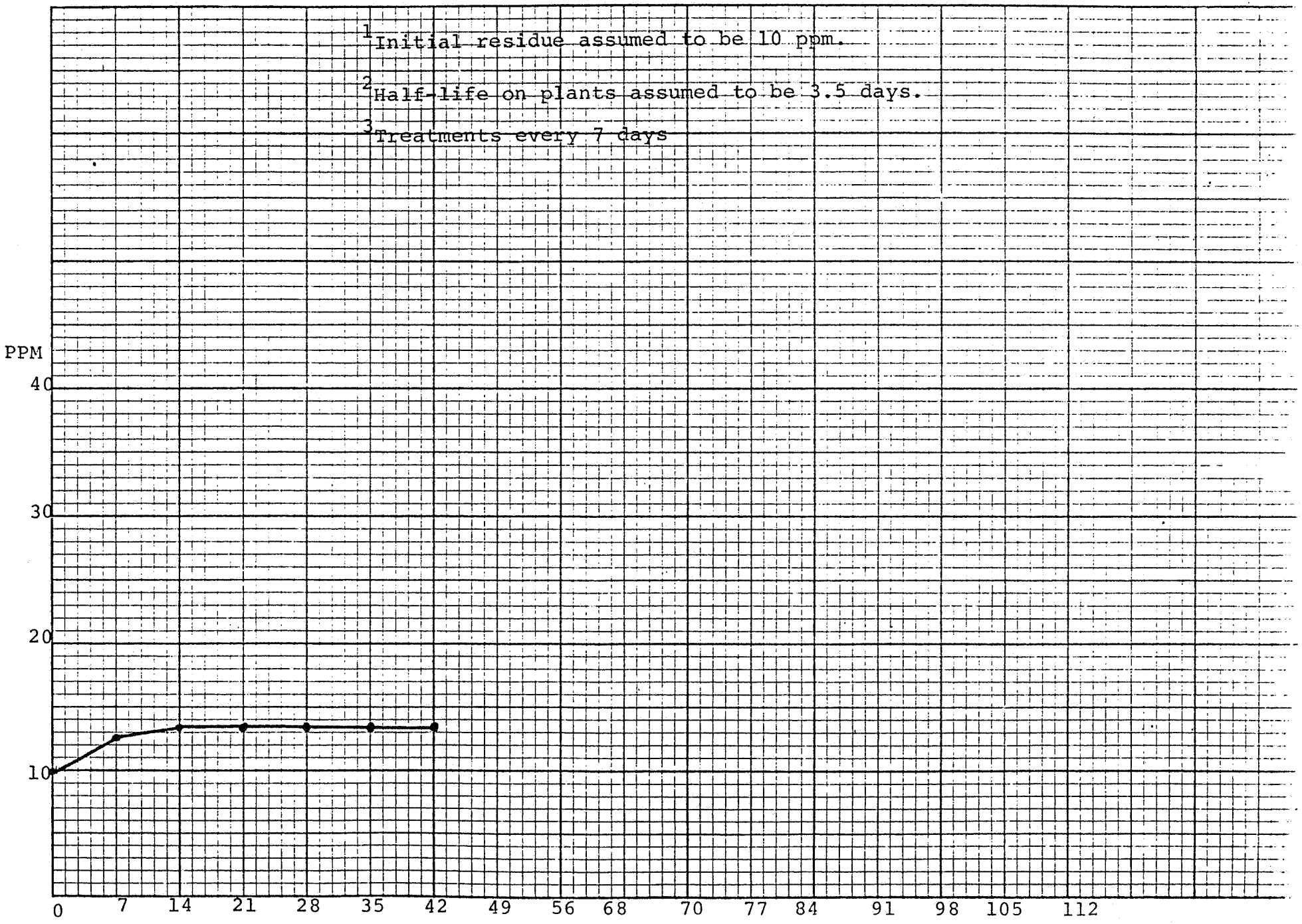
acre (1 A-inch). However, in a telephone conversation with Dr. Donny Powell, Entomology researcher who is affiliated with Washington State University in Extension Research, I learned that 8000 gals. is recommended. Normal systems carry 40,000 gals but when injecting herbicides/insecticides, most growers drop their gallonage to get better results. This is especially recommended for MONITOR since higher gallonages of water cause hydrolysis to occur.

Figure 1: Monitor Insecticide: Expected Residues on Seeds



viewer will assume that a range of 10-58 ppm will be found from one application for seeds (10 ppm), pods (12 ppm), and small insects (58 ppm). Further, the reviewer will assume an average of 32 ppm* MONITOR will be found from one application on most insects. This average is developed from articles by McEwen, Lowell C. (1972) and Davis B.N.K. (1969). Relative to repeat applications, the reviewer assumes that such applications will occur, but on a variable time schedule due to the local conditions involved. The potential "build-up" of residues on seeds/pods, vegetation may occur, for registrant data indicate approximate ½-lives on vegetation of 3-7 days and applications may occur on a 7-10 day interval.

104.2.1 Mammals

The available data indicate MONITOR presents minimal acute, subacute, and/or chronic hazards to mammalian species. The lowest acute oral LD_{50} available for female rats is 13.0 mg/kg, and when one correlates this with potential dietary exposure, one obtains 260 ppm (ppm x 5% F.cons./body wgt.

(average f. cons. for adult rats) = 13.0 mg/kg (day); ppm = 13 ÷ .05=260 ppm) One fifth of 260 ppm**equals 52 ppm, a value close to the maximum expected residue value of 58 ppm on small insects but greater than the 32 ppm value for most insects. Therefore, on the average (32 ppm) residues "in the field" should not approach the 52 ppm (toxicological value) for female rats. Further, the long-term rat feeding studies indicate lethality should occur at levels greater than 30 ppm MONITOR, and this lends some credence to the 52 ppm value generated from the acute study.

*$\bar{x}$ of 56, 7.2, 34, 28, and 35 ppm= 32ppm(see articles)
**Classification/hazard criterion expected to produce 0.1 and 10% mortality in wildlife populations depending upon population sensitivity.

One cannot ignore, of course, the potential for "hot-spots" in treated areas and the repeated applications that may occur. Under these instances, and due to the different sensitivity of various mammalian species, smaller species of insectivores and rodents might be adversely affected. Such effects should be more of an acute/subacute nature, since it is anticipated that the 'mitigating effects' of the environment will lessen the build-up of MONITOR on feed items (seeds, earthworms, insects).

This view is supported by the Environmental Fate data which shows relatively short ½-lives (2-7 days) for various components of the environment, plus a lack of accumulation of MONITOR in fish. (Also, see Figure 1 which shows a maximum build-up on seeds of approximately 13 ppm using a spray interval of 7 days, a rate of 1.0lb.a.i. /A, and an approximate ½-life in plants of 3.5 days.)

Based upon the above considerations, the reviewer recommends that further research "in the field" is warranted to address the potential hazards of the proposed use to small mammals. It is recognized that MONITOR could be considered in the "gray area" concerning further research with mammals, but the reviewer concludes that the potential for 'hot-spots' plus the different sensitivity of various species warrant the research.

104.2.3 Avian Species

Based upon the available data and using the residue assumptions discussed above, the reviewer concludes that potentially serious acute, subacute, and possibly, chronic hazards exist for avian species. Although all of the avian studies are unacceptable to support registration, the studies indicate serious acute hazards to avian species. The two bobwhite quail dietary studies provide LC_{50} values of 47 ppm and 57.5 ppm, 1/5 of

which equal 9.4 and 11.5 ppm, respectively. Average residue values in/on insects may approximate 32 ppm, a value significantly greater than that of 9.4 ppm and 11.5 ppm. Further, when one correlates the potential acute hazards to other smaller avian species (on the assumption that each species has the same sensitivity to MONITOR as bobwhite quail) one finds that residues in the environment (32 ppm in/on insects) can approach or exceed the calculated LC_{50} values for these species (see Tables 1, 2, and 3 attached).

Relative to chronic hazards, the reviewer concludes that repeated applications may provide for such hazards and may do so more by adult mortality than by subtle reproductive effects. MONITOR is acutely toxic but degrades rapidly; therefore, repeated applications may continue to "knock down" the adults and/or fledgelings.

From the above the reviewer concludes that further research is warranted to address the potential adverse effects to non-target avian species. This research should consist of small pen, large pens, or field observations and should address typical use applications. Relative to chronic hazards, it is the understanding of the reviewer that avian reproduction studies are in progress and are required to support any submission for registration (see J. Akerman memo to the file concerning September 14, 1977 meeting of Chemagro and J. Akerman).

104.2.4 Aquatic Species

The available data for MONITOR's effects on aquatic organisms are conflicting in nature. The Daphnia magna study (which is Invalid) indicated a 48-hour LC_{50} of 27 ppb; the bluegill sunfish study provides a 96-hour LC_{50} of 46 ppm; and the rainbow trout study indicates a 96-hour LC_{50} of 51 ppm. The bluegill sunfish results are supported by the results of J. McCann (EPA Lab, Belts-

ville, Md.) who found a 96-hour LC_{50} at 45 ppm. However, in McCann's trout study the 96-hour LC_{50} was determined to be 1.28 ppm, a value significantly different from the 51 ppm of the registrant. (Note that McCann's studies were essentially screening tests since not enough material was available for further testing.) It is not clear, therefore, which values are more correct. The reviewer can only assume that the latter value (1.28 ppm) is more correct in order to "maximize hazard". This value is also supported more by the results of the Daphnia study.

Relative to the hazards to aquatic organisms from the proposed use, it is apparent that contamination of nontarget aquatic areas is probable since: (a) backflow of the pesticide into water sources may occur if label directions are not followed, (b) movement of the pesticide into tailwaters leaving fields (and, consequently, into nontarget areas) can occur, and (a) MONITOR does leach and, therefore, may move downward to contaminate groundwaters.

From the above the reviewer concludes that further research is required to better determine the potential hazards to nontarget aquatic organisms. Initially, the acute bioassays need to be clarified via further testing and/or additional information. Secondly, residue analyses of and/or nontarget organism testing in receiving waterways appear appropriate.

104.3 Endangered Species Considerations

An Endangered/Threatened Species Review was not made at this time due to the numerous data gaps and the poor description (by the registrant) of the use pattern. This portion of the review is deferred until the acute studies are clarified, the field research requested for nontarget organisms has been performed, and a better description

of the use (number of applications/year, quantities of water applied, etc.) has been provided. Further, environmental fate data concerning the likelihood of residues in receiving waterways and on the target site are in order.

104.4 Adequacy of Toxicity Data

See attached Validation Reports, Validation Summary Sheet, and Conclusions Section. Note that the following studies were referenced/submitted for review except for Report No. 32414 which was not located by the Product Manager Team.

Test	EPA Accession No.	Reference
TOXICITY TO BIRDS		
Quail Toxicity of MONITOR (Test S-113)	093265	MONITOR PP 0F0956, Section C, filed by APA on April 8, 1970. Ref. 22, pp 482-490, dated Oct. 18, 1968
Toxicity of MONITOR 6 EC to Juvenile Bobwhite Quail and New Zealand Rabbits under Simulated Field Conditions		Submission of June 16, 1972, to support registration of MONITOR 6 Spray (EPA Reg No. 239-2326). Report No. 32414 (Chemagro) March 3, 1972
Acute Oral Toxicity Study with MONITOR Technical in Bobwhite Quail (Test S-341)	092118	Submission of March 13, 1972 to support registration of MONITOR 6 Spray (EPA Red No. J261 (IBT) Sept. 27, 1971
Acute Oral Toxicity Study with MONITOR Technical in Mallard Ducks (Test S-342)	092118	Submission of March 13, 1972 to support registration of MONITOR 6 Spray (EPA Reg No. 239-2326). Ref. 4, Report No. J262 (IBT) Oct. 29, 1971
Dietary Toxicity of MONITOR Technical to Bobwhite Quail and Mallard Ducks	-	Submission of March 8, 1978 to support registration of MONITOR 4 Liquid Insecticide (EPA Reg. No.3125-280), Report No. 51596 (Chemagro) Feb. 2, 1977.

(table cont.)

Test	EPA Accession No.	Reference
TOXICITY TO FISH		
Four-Day Fish Toxicity Study on MONITOR 75% Technical (Test S-112)	093265	MONITOR PP 0F0956, Section C, filed by EPA on April 8, 1970. Ref. 21, pp 469-481, dated Sept. 27, 1968
TOXICITY TO AQUATIC INVERTEBRATES		
Acute Toxicity of MONITOR Technical to Daphnia magna	--	Submission of March 8, 1978 to support registration of MONITOR 4 liquid Insecticide (EPA Reg. No. 3125-280), Report No. 54045 (Chemagro) Oct. 7, 1977.

104.5 Additional Data Required

See Conclusions Section.

105.0 Classification/RPAR Criteria

Classification/RPAR determinations were not made at this time due to the numerous data gaps. With resolution/submission of appropriate data these determinations will be made.

106.0 Conclusions

106.1 Data Adequacy

The reader is referred to Section 104.4 above for the list of studies reviewed. Note that Report No. 32414 was not reviewed since the Product Team could not locate it. The other studies referenced/submitted are not acceptable to support registration. A discussion of these data follows:

106.1.1 Avian Acute Oral LD_{50} - Bobwhite Quail (Report No. J261):

This study is considered supplemental information (and cannot be used to support a registration) pending submission of the following data:

1. A better description of the experimental design as outlined in the Proposed Guidelines of July 10, 1978.

2. Identification of the purity of the test material used.

3. Identification of whether dose levels were adjusted for percent purity of the chemical.

4. The age of the birds used.

5. The number of hours birds were fasted prior to dosing.

With satisfactory resolution of the above comments this study could be considered in support of registration.

106.1.2 Avian Acute Oral LD_{50} - Mallard Duck (Report No. J262):

This study is considered supplemental information and cannot be used to support the proposed registration. This decision is based upon the following:

1. Incomplete description of the experimental design as outlined in the Proposed Guidelines of July 10, 1978. Specifically, the age of the birds and the number of hours birds were fasted prior to dosing are lacking.

2. The poor dose-response data provided. Such a dose-response pattern precludes the development of the statistically-derived best estimate of the acute oral LD_{50}.

3. The fairly large difference in body weights between Controls and Treatment Groups on Day 0. If this difference were found to be statistically significant, then the implication is that the two Groups are not random samples from the same population. In order to determine this, the individual body weights of Control birds and, if available, those of the Treatment Groups for Day 0 must be submitted.

Note that even with the submission of the information lacking in Points 1 and 3 above, this study cannot be used to support registration due to Point 2 above.

106.1.3 Avian Dietary LC_{50} - Bobwhite Quail (Report No. J6483):

This study is considered unacceptable to support registration based upon the following:

1. Incomplete identification of experimental procedures including a lack of body weight, feed consumption, and reaction (of birds) data.

2. The use of 12-week-old birds in avian dietary studies is not an acceptable procedure.

3. It is unclear as to how the researcher premixed his test diets. It appears that in addition to the pesticide - acetone portion that 2% of the diet consisted of corn oil. Present protocol dictates that the test material is dissolved first in corn oil and then added to the diets in a ratio of 2 parts toxicant-corn oil solution (2% total) to 98 parts (98%) of feed.

4. It is unclear whether acetone was evaporated off prior to feeding the test diets to the birds. Protocol dictates that acetone be eva-

porated off prior to feeding/dosing avian organisms to avoid acetone effects in birds.

Note that Point 2 above (and the other Points, if not resolved) precludes the use of these data to support registration. At best these data could be considered supplemental information.

106.1.4 Avian Dietary LC_{50} - Bobwhite Quail (Report No. 51596):
This study is considered unacceptable to support registration due to the excessive Control mortality (20%) which is supported further by the lack of a dose response (i.e. the same mortality) at the lower three test levels.

106.1.5 Avian Dietary LC_{50} - Mallard Duck (Report No. 51596):

This study is considered supplemental information and cannot be used to support registration. This decision is based upon the following:

1. The large difference in average body weights between Controls and the Treatment Groups on Day 0. If this difference were found to be statistically significant, then the implication is that the Groups are not random samples from the same population. In order to determine this, the individual body weights of Control birds and, if available, those of the Treatment Groups for Day 0 must be submitted.

2. The use of four concentration levels which produce a maximum of 60% mortality is questionable. Six dietary concentrations which produce mortality ranging from 10 to 90 percent are recommended.

3. Incomplete identification of experimental design (as outlined in the Proposed Guidelines of July 10, 1978) and statistical methodology used (if any).

Note that the resolution of the above Points is required prior to consideration of the use of this study in support of registration.

106.1.6 Fish Acute LC_{50} - Rainbow Trout/Bluegill Sunfish (Report No. A6482):

These two studies are considered supplemental information, and cannot be used to support registration. This decision is based upon the following:

1. Incomplete description of experimental design. The concentrations presented are expressed in terms of actual MONITOR. It appears then that adjustment to 100% active ingredient has occurred, but this needs clarification. Also, the researcher has not indicated the loading factor for vessels.

2. The use of polyethlene liners in test vessels. Since absorption of pesticide by test liners may have occurred, the nominal test concentrations presented may be incorrect.

Unless the research facility performed residue analysis of the liners used in the above two studies, these studies cannot be used in support of registration even with submission of information for Point 1 above.

106.1.7 Aquatic Invertebrate Acute LC_{50} - Daphnia magna (Report No. 54045):

This study is considered unacceptable to support registration for the following reasons:

1. Solvent controls were not used. One cannot determine, then, if the toxic symptoms and mortality observed were due to MONITOR plus solvent or to solvent alone.

2. Different instar daphnids were used.

3. A higher test temperature (24° C) than recommended (17-21° C) was used.

106.2 Data Requests

106.2.1 Based upon the discussion in Section 106.1 above, the following studies are definitely required to support registration:

1. The avian dietary LC_{50} for MONITOR technical using an upland game bird (bobwhite quail).

2. The 48-hour acute LC_{50} for an aquatic invertebrate (preferably, Daphnia magna) using MONITOR technical.

106.2.2 Submission and resolution of the other comments in Section 106.1 above will determine what other basic studies are required to support registration. Further, it is noted that a maximum of 75% active ingredient technical material was used in the studies. It is the understanding of the reviewer that there are two other technical monitors: a 95% and a 97% active ingredient. A technical at this higher percent should be used in the studies. Please comment/explain.

106.2.3 Field research is required to address the potential hazards of the proposed use to nontarget mammalian, avian, and aquatic species. Such research must examine the adverse effects from typical use situations. Further, residue analyses of treated areas, drainage ditches, and other receiving waterways are required to address the extent and duration of pesticide residues likely to be found.

106.2.4 It is the understanding of the reviewer that avian reproduction studies are in progress and are near completion. Submission of these data are required to support the proposed use pattern.

106.2.5 Further research may be required but is dependent upon the results/clarification of the above studies. It is recommended that the registrant discuss the above with the Ecological Effects Branch staff in order to determine the intent and scope of the research needed.

107.0 Recommendations to Product Manager

The Ecological Effects Branch recommends against concurrence with the proposed use of MONITOR based upon the conclusions drawn above (See Section 106.0).

Norman J. Cook
Norman J. Cook
Section 1, EEB
August 31, 1978

James W. Akerman 10/30/78
James Akerman, Section Head
Section 1, EEB
Date:

Clayton Bushong 10/30/78
Clayton Bushong, Acting Branch Chief
Ecological Effects Branch
Date:

TEST	DATA REVIEW NUMBER	ACCESSION NUMBER	OWNER	CLASSIFICATION OF STUDY	SATISFACTION OF REGULATORY REQUIREMENT
Avian Acute Oral LD_{50} (Bobwhite Quail)	163.71-1	092118	Chevron Chemical Co.	Supplemental	No
Avian Acute Oral LD_{50} (Mallard Ducks)	103.71-1	092118	Chevron Chemical Co.	Supplemental	No
Avian Dietary LC_{50} (Bobwhite Quail)	163.71-2	093265	Chevron Chemical Co.	Invalid	No
Avian Dietary LC_{50} (Bobwhite Quail)	163.71-2	None	Chemagro Agric. Division	Invalid	No
Avian Dietary LC_{50} (Mallard Ducks)	163.71-2	None	Chemagro Agric. Division	Supplemental	No

TEST	DATA REVIEW NUMBER	ACCESSION NUMBER	OWNER	CLASSIFICATION OF STUDY	SATISFACTION OF REGULATORY REQUIREMENT
Fish Acute LC_{50} (Rainbow Trout)	163.72-1	093265	Chevron Chemical Co.	Supplemental	No
Fish Acute LC_{50} (Bluegill Sunfish)	103.72-1	093265	Chevron Chemical Co.	Supplemental	No
Aquatic Invertebrate Acute LC_{50} (Daphnia magna)	163.72-2	None	Chemagro Agric. Division	Invalid	No

PHONE CONVERSATION

DATE: 8/24/78

NAME: Mr. Lloyd Oldenberg
Wildlife Research Supervisor
Fish and Game Department
P.O. Box 25
Boise, Idaho 83707

PHONE: 208-384-2920

SUMMARY

Called to learn how much potatoes are utilized by wildlife in Idaho. Mr. Oldenberg indicated that potatoes are utilized heavily in the summer months by gallinaceous birds (quail, pheasants, Hungarian partridge) and by small mammals such as cottontails, pigmy cottontails, and jackrabbits. Utilization consists of cover, feeding, and loafing, and insects are especially eaten by the birds. Mr. Oldenberg also indicated that kestrels are abundant in the area, and, therefore, these could conceivably feed on dead/dying song birds affected by MONITOR. He did not know how much utilization of potatoe fields is made by songbirds except that they are there.

Norman J. Cook
Ecological Effects Branch
8/25/78

PHONE CONVERSATION

DATE: 8/24/78

NAME: Dr. G. H. Bishop
Dept. of Entomology
Univ. of Idaho
Moscow, Idaho

PHONE: 208-885-6595
208- 722-5186

SUMMARY

Called Dr. Bishop to learn more about the use of MONITOR on potatoes and, particularly, about the proposed use in irrigation. Dr. Bishop is familiar with MONITOR, having done research with this compound on potatoes, and provided the following information:

1. Application of MONITOR by irrigation water does not provide for as uniform field coverage as aerial/ground applications. Basically, where more water is applied, more pesticide is applied.

2. MONITOR has systemic and contact action against insects and, therefore, some pesticide will kill the aphid immediately by contact whereas that washed off the potato leaves will be taken up by the roots to provide systemic action. He felt that this type of a use provided for less uptake by the plants than by aerial use since MONITOR is also taken up by the leaves of plants sprayed by ground/aerial equipment. Application in water provides for more plant-runoff which provides for MONITOR to be tied-up with the soil.

3. Dr. Bishop indicated that runoff from treated fields is minimal when sprinkler irrigation (the proposed use) is used, for the soils in Idaho are generally light and allow water to leach downward.

4. The Dr. indicated that the reason for seeking this use was because after the potatoe plants grow and fill in the rows, one cannot spray with a tractor. Therefore, aerial spraying is required, and this has become very expensive.

Norman J. Cook
Ecological Effects Branch
8/25/78

PHONE CONVERSATION

DATE: 8/28/78

NAME: Dr. Donny Powell
Extension Research (somehow affiliated with the Washington State University)
Yakima, Wash.

PHONE: 509-575-5877

SUMMARY

Talked to Dr. Powell to learn more about irrigation of potatoes and control of the Green Peach Aphid. I received the following information:

1. Normally most irrigation systems (center pivot anyways) carry 40,000 gals. when irrigation of land takes place. (I took this to mean 40,000 gals/A.)

2. When applying herbicides/insecticides in irrigation water, farmers generally drop the gallonage to get better results. For MONITOR gallonage is dropped to 8000 gallons and good coverage is obtained. Higher gallonages of water with MONITOR are not recommended because hydrolysis of the parent chemical occurs.

3. By conventional equipment (ground/air) MONITOR is applied approximately 5x throughout the season. When using the irrigation water technique, growers may apply 3-4x if no preplant soil treatment with Temik has occured or less if the preplant treatment has taken place.

4. The cost of aerial application is approximately $8.00 per acre. Therefore, large farms must pay more money for insecticide

treatments. Consequently, the attempt at injecting MONITOR into irrigation waters is being taken.

5. Dr. Powell indicated that in Washington State at least all irrigation systems are required to carry automatic shutoff devices to prevent backflow of pesticide into water sources.

6. Relative to runoff waters from treated fields, he indicated that minimal runoff from fields occurs since soils are usually sandy loam. He did remember some areas, however, where runoff does occur.

Norman Cook
8/29/78

101201

EEB BRANCH REVIEW

DATE: IN _____ OUT _____ IN 1/12/78 OUT 4/27/78 IN _____ OUT _____

FISH & WILDLIFE ENVIRONMENTAL CHEMISTRY EFFICACY

FILE OR REG. NO. 3125-280

PETITION OR EXP. PERMIT NO. _____

DATE DIV. RECEIVED _____

DATE OF SUBMISSION _____

DATE SUBMISSION ACCEPTED 5/24/77 DCID-2B-YES

TYPE PRODUCT(S): I, D, H, F, N, R, S Insecticide

PRODUCT MGR. NO. #16

PRODUCT NAME(S) Monitor 4 Spray

COMPANY NAME Chemagro

SUBMISSION PURPOSE Add sprinkler irrigation use on potatoes(currently registered)

CHEMICAL & FORMULATION O,S-Dimethyl phosphoramidothioate

Introduction

Applicant proposes to add directions for use of sprinkler irrigation systems (solid set, not pivot) for application of product to potatoes. The chemical is currently registered for use on potatoes by aerial or ground application.

Conclusions

This is a minor change in directions which fall under the purview of Mr. Johnson's memo.

There is no change in the environmental fate of the pesticide and we do not expect any change in the location of the hazard. Based upon the referenced environmental chemistry data, the environmental fate of the active ingredient is adequately understood for purposes of the minor change in the directions for use.

Ronald E. Kent 6/27/78
R.W. Cook 6-27-78

R. W. Cook
Environmental Chemistry Section
Efficacy and Ecological Effects Branch