

US EPA ARCHIVE DOCUMENT

2-28-92

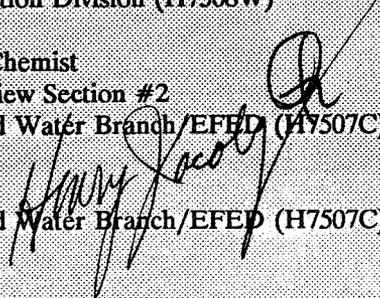
FEB 28 1992

DP Barcode : D170757
PC Code No. : 99901
EFGWB Out :

TO: Barbara Briscoe
Product Manager PM 51
Special Review and Reregistration Division (H7508W)

FROM: Emil Regelman, Supervisory Chemist
Environmental Chemistry Review Section #2
Environmental Fate & Ground Water Branch/EFED (H7507C)

THRU: Henry Jacoby, Chief
Environmental Fate & Ground Water Branch/EFED (H7507C)



Attached, please find the EFGWB review of...

Reg./File # : 099901-000707

Common Name : Oethilinone

Product Name : Kathon; Skane

Company Name : Rohm and Haas Company

Purpose : Review of waiver requests

Type Product : Mildewcide Action Code: 603 EFGWB #(s): 92-0181 Review Time: 3 days

EFGWB Guideline/MRID/Status Summary Table: The review in this package contains...

161-1		162-4	waiver	N	164-4		166-1
161-2		163-1	waiver	N	164-5		166-2
161-3	waiver	Y	163-2		165-1	waiver	Y
161-4		163-3			165-2		167-1
162-1	waiver	Y	164-1	waiver	Y	165-3	waiver
162-2		164-2	waiver	N	165-4	waiver	N
162-3	waiver	N	164-3		165-5		201-1
							202-1

Y = Acceptable (Study satisfied the Guideline)/Concur P = Partial (Study partially satisfied the Guideline, but additional information is still needed)
S = Supplemental (Study provided useful information, but Guideline was not satisfied) N = Unacceptable (Study was rejected)/Non-Concur

1. CHEMICAL:

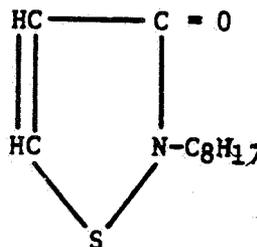
Common name: Othilinone

Chemical name: 2-n-Octyl-4-isothiazolin-3-one

CAS No.: 26530-20-1

Trade Name(s): Kathon; Skane

Chemical Structure:



Formulations: Not available

Physical/Chemical Properties of Active Ingredient:

Molecular Formula: C₁₁H₁₉NOS
Molecular Weight: 213
Physical State: Not available
Vapor Pressure: Not available
Melting Point: Not available
Solubility: Not available

2. TEST MATERIAL:

Not applicable

3. STUDY/ACTION TYPE:

Review of waiver requests for the following studies:

161-3	Photodegradation on soil
162-1	Aerobic Soil Metabolism
162-3	Anaerobic Aquatic Metabolism
162-4	Aerobic Aquatic Metabolism
163-1	Leaching-Adsorption/Desorption
164-1	Terrestrial Field Dissipation
164-2	Aquatic Field Dissipation
165-1	Confined Rotational Crop
165-3	Accumulation-Irrigated Crop
165-4	Bioaccumulation in Fish

4. STUDY IDENTIFICATION:

Correspondence dated September 18, 1991 from Wendy W. Bingaman of Rohm and Haas Company to Frank Rubis of SRRD/OPP/EPA and four attachments in response to the Phase IV Data Call-In Notice for the List B Chemical, Octhilinone.

5. REVIEWED BY:

Larry Liu, Ph.D.
Chemist
Chemistry Section #2
EFGWB/EFED/OPP

Signature: Larry Liu

Date: 2-28-92

6. APPROVED BY:

Emil Regelman
Section Chief
Chemistry Section #2
EFGWB/EFED/OPP

Signature: E. Regelman

Date: FEB 28 1992

7. CONCLUSIONS:

Under the Aquatic Non-Food Industrial use pattern, octhilinone is registered for use in industrial air washer systems and water cooling towers. The registrant claims that there will be no discharge or indirect discharge into the environment unless the discharge effluent is permitted by NPDES or sewage treatment plant. Accordingly, EFGWB believes that the impact of octhilinone-containing effluent on the aquatic environment is greater than the soil environment. Therefore, a tier approach was used to evaluate environmental fate data requirements and corresponding waiver requests for this chemical. Four categories were developed as follows (also see Table A):

(A). Tier I Studies:

According to the use patterns, the following two chemical degradation studies were deemed essential for the understanding of the fate of octhilinone in the aqueous environment:

- | | |
|-------|---------------------------|
| 161-1 | Hydrolysis |
| 161-2 | Photodegradation in Water |

These two studies were initiated in January 1990 and are still in progress.

(B). Tier II Studies:

This tier contains two additional laboratory studies

regarding the biological fate in the aerobic aquatic environment and the mobility of the parent compound or degradation products. Requirements for these studies may be imposed if octhiline or its degradation products are found to be chemically persistent in the Tier I baseline studies.

162-4	Aerobic Aquatic Metabolism
163-1	Leaching-Adsorption/Desorption

(C). Tier III Studies:

Requirements for additional laboratory and field studies are reserved, pending results of Tiers I and II studies. For example, if the parent compound or its degradation products are found persistent and/or mobile, requirements for some or all of the Tier III studies may be imposed. In addition, results from the submitted Kow study may trigger the requirement of 165-4.

162-3	Anaerobic Aquatic Metabolism
164-2	Aquatic Field Dissipation
165-3	Accumulation in Irrigated Crops
165-4	Accumulation in Fish
165-5	Accumulation in Aquatic Non-Target Organisms

(D) Others:

For the following studies, waivers are not needed since requirements do not apply:

161-3	Photodegradation on Soil
162-1	Aerobic Soil Metabolism
164-1	Terrestrial Field Dissipation
165-1	Confined Rotational Crop

8. RECOMMENDATIONS:

The registrant should be informed that Tier II studies (162-4 and 163-1) may be held in reserve pending results of Tier I baseline studies (161-1 and 161-2). If results of Tiers I and II studies indicate a potential impact in the environment, the requirement for Tier III studies (162-3, 164-2, 165-3, 165-4, 165-5) may be imposed.

9. BACKGROUND:

Based on the letter of 9/18/91 from Wendy W. Bingaman of Rohm and Haas Company to Frank Rubis of SRRD/OPP regarding the Reregistration Phase IV Data Call-In Notice, Rohm and

Haas Company is only supporting two use sites: Aquatic Non-Food Industrial (Code F) and Indoor Non-Food (Code M). Rohm and Haas Company is not supporting Terrestrial Food/Feed (Code A/B), Terrestrial Non-Food (Code C), or Residential Outdoor (Code K) uses based on previously registered products, or registrations held by other registrants. The use of octhilinone as cotton seed protectant (Reg. No. 707-127) under Terrestrial Food+Feed use site was canceled in April 1990. The following table outlines the registered uses supported by Rohm and Haas Company.

Reg. No.	Name/Type	Currently Registered Use*
707-100	Skane M-8 Industrial mildewcide	Coatings, wallpaper pastes caulks, formulation of industrial mildewcides (M)
707-104	Kathon LP Mildewcide	Hide and leather processing (M)
707-120	Kathon 4200 Mildewcide	Formulation of fabric mildewcide (M)
707-121	Kathon LM Mildewcide	Fabric mildewcide (M) Industrial microbicide for use in recirculating water cooling towers and air washer systems (F)
707-143	Kathon 893T Industrial mildewcide	Formulation of industrial mildewcides (M)
707-195	Kathon 893 MW Microbicide	Metalworking fluids and hydraulic fluids (M)
707-208	Kathon 893 TP 25% Industrial fungicide	Coatings, caulks and sealants, wallpaper adhesives, aqueous emulsions and adhesives, polymer compounds and fabrics (M)

* Supported use patterns - M (Indoor non-food)
F (Aquatic non-food industrial)

For the Indoor Non-Food use pattern, Study 161-1 is required. For the Aquatic Non-Food Industrial use pattern, Studies 161-1, 161-2, 162-3, 162-4, 163-1, and 164-2 are required whereas Studies 164-1, 164-5, 165-3, 165-4, and

165-5 are conditionally required. Because the Aquatic Non-Food Industrial uses of octhilinone are limited to industrial water cooling towers and air washer systems, EFGWB believes that the impact of the octhilinone-containing effluent on the aquatic environment is probably greater than the soil environment. Therefore, two conditionally-required soil dissipation studies (164-1 and 164-5) are not required. Two conditionally-required accumulation studies (165-3 and 165-5) are to be held in reserve. The other conditionally-required study (165-4) is required. The following table summarizes the data requirements for octhilinone used in Aquatic Non-Food Industrial and Indoor Non-Food:

161-1	Hydrolysis
161-2	Photodegradation in Water
162-3	Anaerobic Aquatic Metabolism
162-4	Aerobic Aquatic Metabolism
163-1	Leaching-Adsorption/Desorption
164-2	Aquatic Field Dissipation
165-3	Accumulation in Irrigated Crops (reserved)
165-4	Bioaccumulation in Fish
165-5	Accumulation in Aquatic Non-Target Organisms (reserved)

Of the required studies, Rohm and Haas Company has committed to submit two studies (161-1 and 161-2). These two studies were initiated in January 1990 and are still in progress. Rohm and Haas Company has requested waivers for six studies (162-3, 162-4, 163-1, 164-2, 165-3, and 165-4). These waiver requests will be discussed in the following section.

10. DISCUSSION OF INDIVIDUAL TESTS OR STUDIES:

According to amended Phase IV package for octhilinone (3/11/91), its use sites are:

Terrestrial Food+Feed Crop
Terrestrial Non-Food Crop
Aquatic Non-Food Industrial
Outdoor Residential
Indoor Non-Food

Environmental fate data requirements for the above-mentioned use sites are in Attachment I.

Of the five use sites for octhilinone, Rohm and Haas Company is only supporting two use sites (Aquatic Non-Food Industrial and Indoor Non-Food). The registrant indicated that the use of octhilinone as cotton seed protectant (Reg. No. 707-127) under Terrestrial Food+Feed use site was canceled in April 1990.

Under the Aquatic Non-Food Industrial use pattern, othilinone is registered for use in industrial air washer systems and water cooling towers. The registrant claims that there will be no discharge or indirect discharge into the environment unless the discharge effluent is permitted by NPDES or sewage treatment plant. Accordingly, EFGWB believes that the impact of othilinone-containing effluent on the aquatic environment is greater than the soil environment. In order to more effectively evaluate environmental fate data requirements and corresponding waiver requests for this chemical, a tier approach was used. Studies were grouped into four categories and discussed separately:

(A) Tier I Studies:

According to the use patterns, the following two chemical degradation studies were deemed essential for the understanding of the fate of othilinone in the aqueous environment:

- 161-1 Hydrolysis
- 161-2 Photodegradation in Water

The registrant has committed to support these studies. These studies were initiated in January 1990. According to the letter of 9/10/91 from the registrant, these studies are still in progress.

(B) Tier II Studies:

Requirements for additional laboratory studies may be imposed if othilinone or its degradation products are found to be chemically persistent in the Tier I baseline studies. Studies in Tier II are as follows:

- 162-4 Aerobic Aquatic Metabolism
- 163-1 Leaching-Adsorption/Desorption

Registrant justifications for waiver requests: Rohm and Haas proposes amending the label (707-121) in order to permit its use only in those industrial cooling towers and air washers where there will be no, or no indirect discharge into the environment ("no discharge, or indirect discharge" were used in the letter of 9/10/91 from Wendy W. Bingaman of Rohm and Haas Company to Frank Rubis of SRRD/OPP). Therefore, the registrant claims that these studies are not needed.

Responses by EFGWB: EFGWB cannot concur with these waiver requests. Requirements for 162-4 and 163-1 studies are reserved, pending results of Tier I studies (161-1 and 161-2).

(C) Tier III Studies:

Additional laboratory and field studies may be required to assess the environmental impact if results from Tiers I and II indicate that the parent compound or its degradation products are persistent and mobile. These studies are listed below:

- 162-3 Anaerobic Aquatic Metabolism
- 164-2 Aquatic Field Dissipation

Registrant justifications for waiver requests: Same justifications as 162-4 and 163-1.

Responses by EFGWB: EFGWB cannot concur with these waiver requests. The requirements for these studies may be imposed if the parent compound or its degradation products are persistent (physically or chemically) and mobile.

- 165-3 Accumulation-Irrigated Crop

Registrant justifications for a waiver request: This chemical is not currently registered for any agricultural uses where run-off containing the parent compound or degradation products might contact sources of water for irrigation purposes. Therefore, this study should not be required.

Responses by EFGWB: Although no run-off is predicted, according to the label for Reg. No. 707-121, certain discharge into lakes, ponds, and streams is allowed. This is in contradiction to the statement "no discharge, or indirect discharge into the environment" in the letter of 9/10/91. The registrant has not addressed the disposal pathway of the othilinone-containing effluent in the environment or the potential discharge of effluent into the water sources which may be used for irrigation.

The requirement for this study is reserved, pending results of Tiers I and II studies.

- 165-4 Bioaccumulation in Fish

Registrant justifications for a waiver request: The registrant submitted an octanol/water partition

coefficient (Kow) study to EPA in 1991 (MRID 41687801). The Kow value was reported to be 282. Because the Kow value is lower than 1,000, the registrant believes that this study should not be required.

Responses by EFGWB: EFGWB cannot concur with this waiver request. The review of the Kow study (MRID 41687801) is still in progress; therefore, the Kow value reported by the registrant has not been confirmed. The requirement for 165-4 study is reserved, pending results of Tier I and II. The requirement may also be imposed based on the confirmed Kow value.

(D) Others:

Requirements for the following studies are for the use sites other than Aquatic Non-Food Industrial and Indoor Non-Food. Therefore, waivers are not needed since requirements do not apply.

161-3	Photodegradation on Soil
162-1	Aerobic Soil Metabolism
164-1	Terrestrial Field Dissipation
165-1	Confined Rotational Crop

11. COMPLETION OF ONE-LINER:

A One-Liner Database file was opened in October 1989. However, no additional data have been submitted to EPA.

12. CBI APPENDIX:

Not applicable.

TABLE A
DATA REQUIREMENTS FOR Octhlinone (Rohm and Haas Company)

Data Requirement	Composition ¹	Use Pattern ²	Does EPA Have Data To Satisfy This Requirement? (Yes, No, or Partially)	Bibliographic Citation	Must Additional Data Be Submitted under FIFRA 3(c)(2)(B)?
<u>§158.290 Environmental Fate</u>					
<u>DEGRADATION STUDIES-LAB:</u>					
161-1 Hydrolysis	PAIRA	6,13	No		Yes (Tier I) ³
161-2 Photodegradation In Water	PAIRA	6	No		Yes (Tier I) ³
161-3 Photodegradation On Soil	PAIRA	N/A			
161-4 Photodegradation In Air	PAIRA	N/A			
<u>METABOLISM STUDIES-LAB:</u>					
162-1 Aerobic Soil	PAIRA	N/A			
162-2 Anaerobic Soil	PAIRA	N/A			
162-3 Anaerobic Aquatic	PAIRA	6	No		Reserved (Tier III) ⁵
162-4 Aerobic Aquatic	PAIRA	6	No		Reserved (Tier II) ⁴
<u>MOBILITY STUDIES:</u>					
163-1 Leaching-Adsorption/Desorption	PAIRA	6	No		Reserved (Tier II) ⁴
163-2 Volatility (Lab)	TEP	N/A			
163-3 Volatility (Field)	TEP	N/A			
<u>DISSIPATION STUDIES-FIELD:</u>					
164-1 Soil	TEP	N/A			
164-2 Aquatic (Sediment)	TEP	6			
164-3 Forestry	TEP	N/A	No		Reserved (Tier III) ⁵
164-5 Soil, Long-term	TEP	N/A			

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Data Requirement	Composition ¹	Use Pattern ²	Does EPA Have Data To Satisfy This Requirement? (Yes, No, or Partially)	Bibliographic Citation	Must Additional Data Be Submitted under FIFRA 3(c)(2)(B)?
158.230 Environmental Fate (con't)					
ACCUMULATION STUDIES:					
165-1 Rotational Crops (Confined)	PAIRA	N/A			
165-2 Rotational Crops (Field)	TEP	N/A			
165-3 Irrigated Crops	TEP	6	No		Reserved (Tier III) ⁶
165-4 In Fish	PAIRA	6	No		Reserved (Tier III) ⁷
165-5 In Aquatic Non-Target Organisms	TEP	6	No		Reserved (Tier III) ⁸
166-1 Ground Water Small Prospective	TEP	N/A			
166-2 Ground Water Small Retrospective	TEP	N/A			
166-3 Ground Water Large Retrospective	TEP	N/A			
167-1 Field Run-off	TEP	N/A			
167-2 Surface Water Monitoring	TEP	N/A			
158.440 SPRAY DRIFT:					
201-1 Droplet Size Spectrum	TEP	N/A			
202-1 Drift Field Evaluation	TEP	N/A			

1. Composition: TGA= Technical grade of the active ingredient; PAIRA= Pure active ingredient, radiolabeled; TEP= Typical end-use product.

2. Use Patterns: N/A= Not applicable; 1= Terrestrial Food; 2= Terrestrial Feed; 3= Terrestrial Non-Food; 4= Aquatic Food; 5= Aquatic Non-Food (Outdoor); 6= Aquatic Non-Food (Industrial); 7= Aquatic Non-Food (Residential); 8= Greenhouse Food; 9= Greenhouse Non-Food; 10= Residential Outdoor; 12= Indoor Food; 13= Residential Indoor; 14= Indoor Medical; 15= Indoor Residential.

3. This is considered as a Tier I study which was deemed essential for the understanding of the fate of octhlinone in the environment. The study was initiated in January 1990 and is still in progress.

4. This is considered as a Tier II study that the requirement is reserved, pending results of Tier I studies. If the parent compound or its degradation products are found chemically persistent, the requirement of this study may be imposed.

5. This is considered as a Tier III study that the requirement is reserved, pending results of Tiers I and II studies. If the parent compound or its degradation products are found persistent and mobile in the environment, the requirement of this study may be imposed.

6. This is considered as a Tier III study that the requirement is reserved, pending results of Tiers I and II studies. At the present time, there are no sufficient fate data and use information to indicate if discharge can contaminate water used for irrigation.

7. This is considered as a Tier III study that the requirement is reserved, pending results of Tiers I and II studies. The requirement may also be imposed if results of the Kow study (MRID 41687801; under review) indicate a potential impact in the environment.

8. This is considered as a Tier III study. The requirement is reserved pending results of 165-4.



EPGWB No: 90-0801
Case No: 2475
Chemical No: 099901
DP Barcode No: 154526

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

ATTACHMENT I

OFFICE OF
PESTICIDES AND TOXIC
SUBSTANCES

MEMORANDUM

SUBJECT: AMENDMENT TO: Review of Phase IV Package for Octhlinone

FROM: Dana Spatz, Chemist
Chemistry Review Section #2
Environmental Fate and Ground Water Branch
Environmental Fate and Effects Division (H7507C)

TO: Amy Rispin, Chief
Science Analysis and Coordination Staff
Environmental Fate and Effects Division (H7507C)

THRU: Henry Jacoby, Chief
Environmental Fate and Ground Water Branch
Environmental Fate and Effects Division (H7507C)

Emil Regelman, Supervisory Chemist
Chemistry Review Section #2
Environmental Fate and Ground Water Branch
Environmental Fate and Effects Division (H7507C)

MAR 1 1991

The Phase IV review package for List B chemical Octhlinone (case no. 2475) was received by EFGWB on August 21, 1990. The package consisted of the Phase II and Phase III responses from Rohm and Haas including a summary of Chemical Identity data (160-5) and an Aquatic Dissipation "model" study (164-2) that was received by the Agency in May 1990. This model study cannot be evaluated because validated environmental fate data have not been submitted. The data used in the model were generated during the 1970's and were not validated by the Agency and were most likely obtained from studies that are not consistent with current Subdivision N Guidelines.

The LUIS report, dated January 21, 1991 lists the following use patterns:

- Terrestrial Food + Feed Crop
- Terrestrial Non-Food Crop
- Aquatic Non-Food Industrial
- Outdoor Residential
- Indoor Non-Food

However, based on the Phase IV package, the use patterns for Octhilinone, according to the registrant, are: Aquatic Non-Food (Industrial) and Indoor Non-Food.

According to the registrant, octhilinone is currently used as an industrial mildewcide (paints, coatings, wall paper pastes, caulks, sealants, aqueous emulsions, adhesives, polymer compounds, fabric, and leather processing). Octhilinone is also used as a microbicide in recirculating cooling towers and air washers and as an industrial fungicide for use in metalworking and hydraulic fluids. The discrepancies between the LUIS report and the registrant's Phase II response are that the LUIS report shows the following use patterns that are not indicated by the registrant: Terrestrial Food+Feed Crop use (cotton; seed treatment), Terrestrial Non-Food Crop use (wood protection treatment), and Outdoor Residential use (wood protection treatment).

The attached table outlines the status of each data requirement. There are currently no Environmental Fate data requirements for the Indoor Non-Food use.

TABLE A
DATA REQUIREMENTS FOR Octithlone

Data Requirement	Composition ¹	Use Pattern ²	Does EPA Have Data To Satisfy This Requirement? (Yes, No, or Partially)	Bibliographic Citation	Must Additional Data Be Submitted under FIFRA 3(c)(2)(B)?
<u>§158.290 Environmental Fate</u>					
<u>DEGRADATION STUDIES-LAB:</u>					
161-1 Hydrolysis	PAIRA	1,3,6,11	No		Yes ³
161-2 Photodegradation In Water	PAIRA	1,3,6	No		Yes ³
161-3 Photodegradation On Soil	PAIRA	1,3	No		Yes
161-4 Photodegradation In Air	PAIRA	1,3,11	No		No
<u>METABOLISM STUDIES-LAB:</u>					
162-1 Aerobic Soil	PAIRA	1,3,11	No		Yes ⁴
162-2 Anaerobic Soil	PAIRA	1,3	No		No ³
162-3 Anaerobic Aquatic	PAIRA	1,3,6	No		Yes ³
162-4 Aerobic Aquatic	PAIRA	6	No		Yes ³
<u>MOBILITY STUDIES:</u>					
163-1 Leaching-Adsorption/Desorption	PAIRA	1,3,6,11	No		Yes ³
163-2 Volatility (Lab)	TEP	1	No		No ⁵
163-3 Volatility (Field)	TEP	1	No		No
<u>DISSIPATION STUDIES-FIELD:</u>					
164-1 Soil	TEP	1,3,11	No		Yes
164-2 Aquatic (Sediment)	TEP	6	No		Yes ⁶
164-3 Forestry	TEP				
164-5 Soil, Long-term	TEP	1,3,6,11	No		Reserved ⁷

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Date Requirement	Composition ¹	Use Pattern ²	Does EPA Have Data To Satisfy This Requirement? (Yes, No, or Partially)	Bibliographic Citation	Must Additional Data Be Submitted under FIFRA 3(c)(2)(B)?
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158.290 Environmental Fate (con't)

ACCUMULATION STUDIES:

165-1 Rotational Crops (Confined)	PAIRA	1,3	No		Yes
165-2 Rotational Crops (Field)	TEP	1,3	No		Reserved ⁸
165-3 Irrigated Crops	TEP	6	No		Yes ⁹
165-4 In Fish	PAIRA	1,3,6	No		Yes
165-5 In Aquatic Non-Target Organisms	TEP	1,3,6	No		Reserved ¹⁰
166-1 Ground Water Small Prospective	TEP	1,3	No		No ¹¹
166-2 Ground Water Small Retrospective	TEP	1,3	No		No ¹¹
166-3 Ground Water Large Retrospective	TEP	1,3	No		No ¹¹

158.440 SPRAY DRIFT:

201-1 Droplet Size Spectrum	TEP	1,3	No		No ¹²
202-1 Drift Field Evaluation	TEP	1,3	No		No

1. Composition: TGA1= Technical grade of the active ingredient; PAIRA= Pure active ingredient, radiolabeled; TEP= Typical end-use product.
2. Use patterns: 1=Terrestrial, Food; 2=Terrestrial, Feed; 3=Terrestrial, Non-Food; 4=Aquatic, Food; 5=Aquatic, Non-Food (Outdoor); 6=Aquatic Non-Food (Industrial); 7=Aquatic Non-Food (Residential); 8=Greenhouse Food; 9=Greenhouse Non-Food; 10=Forestry; 11=Residential Outdoor; 12=Indoor Food; 13=Indoor Non-Food; 14=Indoor Medical; 15=Indoor Residential.
3. Registrant has committed to supply a new study.
4. Anaerobic Aquatic Metabolism study will support this data requirement.
5. Not required for seed treatment.
6. A modeling study (41482511) has been submitted. However, the model cannot be evaluated because validated environmental fate data have not been submitted. The aquatic field study is required.
7. Reserved pending the results of the laboratory metabolism and short-term field dissipation data.
8. Reserved pending results of 165-1.
9. Registrant may request a waiver if it can be demonstrated that the active ingredient and any significant degradates will not contaminate water that may be used for irrigation purposes.
10. Reserved pending results of 165-4.
11. Not required at this time.
12. Not required for current uses/application techniques.

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