



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

EEB;  
file

MAR 18 1996

OFFICE OF  
PREVENTION, PESTICIDES AND  
TOXIC SUBSTANCES

MEMORANDUM

Page 1 of 3

**Subject:** Review and evaluation of aquatic invertebrate and fresh water fish toxicity studies for the insecticide Permethrin) -- (Chemical Code: 109701 -- DP Barcode D218413) and MRID Nos.: 437406-01; 437406-02 and 437457-01.

**FROM:** Anthony F. Maciorowski, Chief  
Ecological Effects Branch  
Environmental Fate and Effects Division  
7507C

NCWK  
for 03/18/96

**To:** Kathleen Depukat, PM 51  
(Paul Lewis)  
Special Review and Registration Division  
7508W

This is the Ecological Effects Branch (EEB) review and evaluation of three aquatic invertebrate and fresh water fish studies to be used in determining the toxicity and environmental risk assessment for the insecticide Permethrin.

A detailed and final evaluation of the various studies submitted under D218413 indicates that the above mentioned studies are scientifically sound and fulfill guideline requirements (CORE) and can be used for reregistration purposes. The following is a listing of the studies reviewed and the corresponding results and conclusions:

1. **CITATION:** Kent S.J., N.J. Williams, E. Gillings, and D.S. Morris, 1995. Permethrin: Chronic Toxicity to *Daphnia magna* Performing laboratory: Zeneca Brixham Environmental Laboratory, Brixham, Devon, U.K. Sponsor: ZENECA Inc., Wilmington, DE. Laboratory Report ID: BL5443/B. MRID No.: 437457-01. DP Barcode: D218413.

**CONCLUSIONS:** This study is scientifically sound and fulfills the guideline requirements for a freshwater invertebrate life-cycle test using *Daphnia magna*.



**Results Synopsis:** (TEST MATERIAL: <sup>14</sup>C-Permethrin -- Purity: ≥98.6% radio purity)

**NOEC:** 39 ng/L **LOEC:** 84 ng/L **MATC:** 57 ng/L

**LOEC's for specific effects:**

Neonates Produced: 84 ng/L

Daphnid Survival: 340 ng/L

Growth (weight): >340 ng/L

Growth (length): 84 ng/L

**2. CITATION:** Kent S.J., D.S. Morris, A.J. Banner and P.A. Johnson, 1995. PERMETHRIN: Acute Toxicity to *Daphnia magna* of a 2 lb./Gallon (25%) Formulation. Performing laboratory: Brixham Environmental Laboratory, Brixham, Devon, U.K. Sponsor: ZENECA Inc., Wilmington, DE. Laboratory Report ID: BL5382/B. MRID No.: 437406-02. DP Barcode: D218413.

**CONCLUSIONS:** This study is scientifically sound and fulfills the guideline requirements for testing with a formulated product. A 48-hour LC<sub>50</sub> value of 0.86 ppb ai (3.3 ppb as whole test material) would classify permethrin as very highly toxic to *Daphnia magna*. The NOEC was 0.33 ppb ai (1.3 ppb as whole test material) since no mortality or sublethal effects were observed at this concentration.

**Results Synopsis**

Results expressed as **active ingredient:**

|                                     |                                   |
|-------------------------------------|-----------------------------------|
| <b>LC<sub>50</sub>:</b> 0.86 ppb ai | <b>95% C.I.:</b> 0.72-1.02 ppb ai |
| <b>NOEL:</b> 0.33 ppb ai            | <b>Probit Slope:</b> 5.6          |

Results expressed as **whole test material:**

|                                 |                              |
|---------------------------------|------------------------------|
| <b>LC<sub>50</sub>:</b> 3.3 ppb | <b>95% C.I.:</b> 2.7-3.9 ppb |
| <b>NOEC:</b> 1.3 ppb            | <b>Probit Slope:</b> 5.6     |

**3. CITATION:** Kent S.J., D.S. Morris, J.E. Caunter, and P.A. Johnson, 1995. Permethrin: Acute Toxicity to Rainbow Trout (*Oncorhynchus mykiss*) of a 2 lb./Gallon (25%) Formulation. Performing laboratory: Brixham Environmental Laboratory, Brixham, Devon, U.K. Sponsor: ZENECA Inc., Wilmington, DE. Laboratory Report ID: BL5427/B. MRID No.: 437406-01. DP Barcode: D218413.

**CONCLUSIONS:** This study is scientifically sound and meets the guideline requirements for an acute freshwater fish toxicity test using a formulated product. A 96-hour LC<sub>50</sub> value of 8.4 ppb ai (32 ppb as total product) would classify permethrin as very highly toxic to rainbow trout. Mortality or sublethal effects were noted at all test concentrations,

therefore the NOEC could not be determined.

**Results Synopsis**

Results expressed as **active ingredient**:

|                         |                 |                                  |
|-------------------------|-----------------|----------------------------------|
| <b>LC<sub>50</sub>:</b> | 8.4 ppb ai      | <b>95% C.I.:</b> 6.8-11.2 ppb ai |
| <b>NOEC:</b>            | Not determined. | <b>Probit Slope:</b> N/A         |

Results expressed as **total product**:

|                         |                 |                            |
|-------------------------|-----------------|----------------------------|
| <b>LC<sub>50</sub>:</b> | 32 ppb          | <b>95% C.I.:</b> 26-43 ppb |
| <b>NOEC:</b>            | Not determined. | <b>Probit Slope:</b> N/A   |

Please find herein attached copies of EEB's data evaluation reviews (DERs) for the above mentioned studies.

If we can be of further assistance, please contact Alvaro A. Yamhure of the EEB staff at (703) 305-6179.

Attachments

## UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

MAR 18 1996

## MEMORANDUM

Page 1 of 3

**Subject:** Review and evaluation of aquatic invertebrate and fresh water fish toxicity studies for the insecticide Permethrin) -- (Chemical Code: 109701 -- DP Barcode D218413) and MRID Nos.: 437406-01; 437406-02 and 437457-01.

**FROM:** Anthony F. Maciorowski, Chief  
Ecological Effects Branch  
Environmental Fate and Effects Division  
7507C

**To:** Kathleen Depukat, PM 51  
(Paul Lewis)  
Special Review and Registration Division  
7508W

This is the Ecological Effects Branch (EEB) review and evaluation of three aquatic invertebrate and fresh water fish studies to be used in determining the toxicity and environmental risk assessment for the insecticide Permethrin.

A detailed and final evaluation of the various studies submitted under D218413 indicates that the above mentioned studies are scientifically sound and fulfill guideline requirements (CORE) and can be used for reregistration purposes. The following is a listing of the studies reviewed and the corresponding results and conclusions:

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**CONCLUSIONS:** This study is scientifically sound and fulfills the guideline requirements for a freshwater invertebrate life-cycle test using *Daphnia magna*.

| CONCURRENCES |         |          |             |  |  |  |
|--------------|---------|----------|-------------|--|--|--|
| SYMBOL       | 7507C   | 7507C    | 7507C       |  |  |  |
| SURNAME      | YAMHARR | Cook     | Cook for Am |  |  |  |
| DATE         | 3/13/96 | 03/18/96 | 03/18/96    |  |  |  |

DP Barcode : D218413  
PC Code No : 109701  
EEB Out : 03/18/96

To: Kathleen Depukat  
Chemical Review Manager 51  
Special Review and Reregistration Division (7508W)

From: Anthony F. Maciorowski, Chief  
Ecological Effects Branch/EFED (7507C)

Attached, please find the EEB review of...

Reg./File # : 109701  
Chemical Name : Permethrin, mixed cis,trans  
Type Product : Insecticide  
Product Name : Permethrin products  
Company Name : Zeneca, Inc.  
Purpose : Submission of additional acute and chronic toxicity data in support of reregistration.

Action Code : 627 Date Due : 11/14/95  
Scientist : A. Yamhure Date In : 08/30/95

EEB Guideline/MRID Summary Table: The review in this package contains an evaluation of the following:

| GDLN NO | MRID NO   | CAT | GDLN NO | MRID NO   | CAT | GDLN NO  | MRID NO | CAT |
|---------|-----------|-----|---------|-----------|-----|----------|---------|-----|
| 71-1(A) |           |     | 72-2(A) |           |     | 72-7(A)  |         |     |
| 71-1(B) |           |     | 72-2(B) | 437406-02 | Y   | 72-7(B)  |         |     |
| 71-2(A) |           |     | 72-3(A) |           |     | 122-1(A) |         |     |
| 71-2(B) |           |     | 72-3(B) |           |     | 122-1(B) |         |     |
| 71-3    |           |     | 72-3(C) |           |     | 122-2    |         |     |
| 71-4(A) |           |     | 72-3(D) |           |     | 123-1(A) |         |     |
| 71-4(B) |           |     | 72-3(E) |           |     | 123-1(B) |         |     |
| 71-5(A) |           |     | 72-3(F) |           |     | 123-2    |         |     |
| 71-5(B) |           |     | 72-4(A) |           |     | 124-1    |         |     |
| 72-1(A) |           |     | 72-4(B) | 437457-01 | Y   | 124-2    |         |     |
| 72-1(B) |           |     | 72-5    |           |     | 141-1    |         |     |
| 72-1(C) |           |     | 72-6    |           |     | 141-2    |         |     |
| 72-1(D) | 437406-01 | Y   |         |           |     | 141-5    |         |     |

Y=Acceptable (Study satisfied Guideline)/Concur

P=Partial (Study partially fulfilled Guideline but additional information is needed)

S=Supplemental (Study provided useful information but Guideline was not satisfied)

N=Unacceptable (Study was rejected)/Nonconcur

DP BARCODE: D218413

REREG CASE # 2510

CASE: 819432  
SUBMISSION: S492059

DATA PACKAGE RECORD  
BEAN SHEET

DATE: 10/04/96  
Page 1 of 1

\* \* \* CASE/SUBMISSION INFORMATION \* \* \*

CASE TYPE: REREGISTRATION ACTION: 627 CORE DATA  
CHEMICALS: 109701 Permethrin, mixed cis,trans (ANSI) 100.00 %  
ID#: 109701  
COMPANY:  
PRODUCT MANAGER: 51 KATHLEEN DEPUKAT 703-308-8587 ROOM: CS1 4F6  
PM TEAM REVIEWER: PAUL LEWIS 703-305-7398 ROOM: CM2 718Q  
RECEIVED DATE: 08/04/95 DUE OUT DATE: 11/02/95

\* \* \* DATA PACKAGE INFORMATION \* \* \*

DP BARCODE: 218413 EXPEDITE: N DATE SENT: 08/16/95 DATE RET.: 03/20/96  
CHEMICAL: 109701 Permethrin, mixed cis,trans (ANSI)  
DP TYPE: 101 Phase IV Review  
CSF: N LABEL: N

| ASSIGNED TO     | DATE IN  | DATE OUT | ADMIN DUE DATE: 11/14/95 |
|-----------------|----------|----------|--------------------------|
| DIV : EFED      | 08/29/95 | 03/20/96 | NEGOT DATE: / /          |
| BRAN: EEB       | 08/30/95 | 03/18/96 | PROJ DATE: / /           |
| SECT: RS2       | 08/30/95 | 03/18/96 |                          |
| REVR : AYAMHURE | 08/30/95 | 03/18/96 |                          |
| CONTR:          | / /      | / /      |                          |

\* \* \* DATA REVIEW INSTRUCTIONS \* \* \*

Please review MRID 43745701 for guideline 72-4b and MRIDs 43740601 and 43740602 corresponding to guidelines 72-1d and 72-2b. If you have any questions, please call Paul Lewis at 308-8018. Thanks.

\* \* \* DATA PACKAGE EVALUATION \* \* \*

No evaluation is written for this data package

\* \* \* ADDITIONAL DATA PACKAGES FOR THIS SUBMISSION \* \* \*

| DP BC | BRANCH/SECTION | DATE OUT | DUE BACK | INS | CSF | LABEL |
|-------|----------------|----------|----------|-----|-----|-------|
|-------|----------------|----------|----------|-----|-----|-------|