098301

098301

Date Out EFB: 13 OCT 1983

To: Jay Ellenberger
Product Manager 12
Registration Division (TS-767)

From: Richard V. Moraski, Ph.D., (Acting) Head
Review Section No. 1
Exposure Assessment Branch
Hazard Evaluation Division (TS-769)

Attached please find the environmental fate review of:

Reg./File No.: 264-330 and 264-331

Chemical: Aldicarb

Type Product: Insecticide/nematicide

Product Name: TEMIK (10G and 5G)

Company Name: Union Carbide

Submission Purpose: Review new hydrolysis study

ZBB Code: other

Date In: 8/19/83

Date Completed: 13 OCT 1983

ACTION CODE: 336

EFB # 3494 and 3495

TAIS (level II)	Days
67	1

Deferrals To:

_____ Ecological Effects Branch

_____ Residue Chemistry Branch

_____ Toxicology Branch

1. INTRODUCTION

1.1 In response to questions regarding a previous hydrolysis study on aldicarb (see the 2/22/83 EAB evaluation, section 3.2), Union Carbide has enclosed their most recent draft of their hydrolysis paper.

1.2 The accession number of this submission is 250888.

2. DISCUSSION

2.1 This study is not a new study but contains hydrolysis data identical to the data in the version reviewed in the 2/22/83 EAB evaluation and to the version submitted with the 1981 groundwater monitoring data in March 1982.

3. RECOMMENDATIONS

3.1 Comments on this hydrolysis study, as given in the 2/22/83 EAB evaluation, still stand. It is noted that this study has been published in "Enviro. Tox. and Chem." vol. 2, no. 2, 1983. However, in addition to the earlier comments on this study, as noted above, the following comments are made:

3.1.1 In the CONCLUSIONS section of the hydrolysis study, the following statement is made - "Aldicarb itself has not been found in groundwater." According to EAB files, Union Carbide makes this statement based on analyses of 41 well water samples (many from the same well but on different days) from east Suffolk County which showed residues to be about 50:50 sulfoxide to sulfone (except for 1 sample that contained 10% parent aldicarb). Aldicarb itself has not been found in groundwater in other areas because it has not been looked for in other areas. Furthermore, to imply that it will not be found in groundwater anywhere in the United States because it was not found in east Suffolk County, NY groundwater, is not justifiable.

3.1.2 The study additionally states that groundwater concentrations of aldicarb residues would be decreased by "...aerobic and anaerobic microbes present in groundwater." This statement is not supported by data but, in fact, is contradicted by several articles in the published literature which show that sulfoxides are reduceable to sulfides. If this happens to aldicarb sulfoxide, then an increase in the persistence of aldicarb residues will result. Refer to the May 16, 1983 and August 30, 1983 EAB evaluations of Temik for further discussion on this matter.

3.2 The expanded hydrolysis study referred to by Dr. R. Jones in his May 10, 1983 memo to Mr. S. Lovell (and included with this submission) is noted. We would like a copy of that study as soon as it is completed.

Samuel M. Creeger

Samuel M. Creeger
October 13, 1983
Section #1/EAB
Hazard Evaluation Division

UNION CARBIDE AGRICULTURAL PRODUCTS COMPANY, Inc.
P. O. BOX 12014, T. W. ALEXANDER DRIVE
RESEARCH TRIANGLE PARK, N. C. 27709
(919) 549-2000

EPA Correspondence No. 219-83
July 28, 1983

U.S. ENVIRONMENTAL PROTECTION AGENCY
Insecticide/Rodenticide Branch
Registration Division (TS-767C)
Crystal Mall Building 2 - Room 202
1921 Jefferson Davis Highway
Arlington, Virginia 22202

Attn: Jay S. Ellenberger
Product Manager (12)

Re: Aldicarb Hydrolysis Data

Dear Mr. Ellenberger:

Earlier this spring in discussions with Mr. Sam Creeger, he raised several questions with our research scientist, Dr. Russell Jones, concerning a draft report on aldicarb hydrolysis. Dr. Jones has addressed several comments of clarification to me on this matter, and I am enclosing his comments un-edited along with our latest draft of the aldicarb hydrolysis report.

Sincerely,

J. S. Lovell, Registration Manager
Insecticides and Intermediates
Registration & Regulatory Affairs

JSL/gb
Enclosure

INTERNAL CORRESPONDENCE

RECEIVED
MAY 10 1983
J.S. LOVELL

UNION CARBIDE AGRICULTURAL PRODUCTS COMPANY, Inc.
P O BOX 12014, T W ALEXANDER DRIVE RESEARCH TRIANGLE PARK, N C 27709

To (Name) J. S. Lovell
Division
Location
Floor Number

Date May 10, 1983
From (Name & Dept.)
R. L. Jones, R/D
Answering letter date

Copy to G. G. Madgwick

Subject Response to S. M. Creeger Questions

Dear Steve:

In our conversation with the Environmental Protection Agency during the last couple of months, S. M. Creeger has asked some questions about our hydrolysis data for aldicarb sulfoxide and aldicarb sulfone. This letter attempts to answer the questions he has raised.

I have enclosed the most recent draft of our hydrolysis paper. The revisions made since the preliminary draft S. M. Creeger received address many of the questions made by him and other reviewers. The copy enclosed is the final draft and will be published later this year.

Please remember when responding to criticisms of the experimental design, that the hydrolysis rate was not known at the start of the experiments. Therefore, a quasilogrithmic sampling schedule was chosen. This means that more samples were taken near the beginning of the experiment than near the end. As a result, the estimates of the half-life are quite sensitive to the last sample. In the expanded hydrolysis study I referred to in my April 25 presentation at the Environmental Protection Agency, we will be able to correct this deficiency (but only because of the half-life estimates that we obtained from the earlier hydrolysis work).

Another problem which is highlighted by the sampling schedule is the ±10 percent variation in a single analysis. Especially in the samples near the start where concentration differences are small, this analytical variation contributes to the appearance of considerable scatter in the data. Eliminating many of the earlier points in our current study will make the results more aesthetically pleasing without reducing the statistical validity of the results.

Another question S. M. Creeger raised was our response to the Cornell claim that our data indicated that hydrolysis was not a first order reaction as our hydrolysis paper states. Cornell's position is based on the drop off in rate with the data generated using high pH solutions. As stated in the paper, I feel that this apparent slowdown in rate is due to the presence of aldicarb sulfoxide nitrile and aldicarb sulfone nitrile which was not removed in the analytical procedure used in the earlier hydrolysis study. Preliminary data obtained with high pH solutions from our current study (Figure 1) shows that the kinetics are indeed first order over the entire range of residues found in groundwater.

I hope these comments will be useful to you. Please contact me if you need any additional information.

Yours truly,

Russell L. Jones

Russell L. Jones

Enclosure

afg