4-26-84

108401
SHAUGHNESSEY NO.

33
REVIEW NO.

EEB BRANCH REVIEW

DATE: IN 3/7/84 OUT APR 26 1984

FILE OR REG. NO. 239-2449, 239-2450

PETITION OR EXP. PERMIT NO.

DATE OF SUBMISSION 2/27/84

DATE RECEIVED BY HED 3/6/84

RD REQUESTED COMPLETION DATE 5/6/84

EEB ESTIMATED COMPLETION DATE 4/29/84

RD ACTION CODE/TYPE OF REVIEW 576/DATA FOR REVIEW

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

DATA ACCESSION NO(S).

PRODUCT MANAGER NO. R. Mountfort (23)

PRODUCT NAME(S) Bolero 8EC:239-2450

Bolero 10G:239-2449

COMPANY NAME Chevron Chemical Company

SUBMISSION PURPOSE Submission of Further Aquatic Field Monitoring Data

SHAUGHNESSEY NO.	CHEMICAL, & FORMULATION	% A.I.
108401	Thiobencarb	

(1)

Bolero

100 Submission Purpose

Chevron Chemical Corporation submitted a progress report supplement which included shrimp residue data. They also submitted 6 other studies addressing Bolero's environmental behavior.

101 Study Validation Results

101.1 Progress Report Supplement

EEB acknowledges receipt of a supplemental progress report which included shrimp residue data. The progress report shows that study is being performed by Chevron as agreed. Final conclusions will be made and the entire study evaluated when it is completed and a final report is submitted. It should be noted that as of this date, the results of sweep net sampling have not been submitted. This data is important to the study because it will provide a basis of judging whether invertebrate populations have been affected by Bolero.

101.2 Acute Toxicity and Bioconcentration

CITATION: Sanders, Herman O. and Joseph B. Hunn. 1982. Toxicity, Bioconcentration, and Depuration of the Herbicide Bolero 8EC in Freshwater Invertebrates and Fish. In Bulletin of the Japanese Society of Scientific Fisheries. Volume 48(8), 1139-1143).

RESULTS:

Species (common name)	Test Temp.	96-hr LC50 ppm (95% C.L.) [2]	BCF [1] 75 ppm	5 days 28 ppm
3) Daphnia magna (daphnids)	21°C	1.2 (0.4 - 3.1)	16	26
Gammarus pseudolimnaeus (amphipods)	17°C	1.0 (0.6 - 1.7)	76	168
Orconectes nais (crayfish)	21°C	2.0 (1.4 - 3.6)	--	--
Procambarus clarki (red crayfish)	21°C	6.5 (5.7 - 7.1)	18	11 4)
Chrionomus plumosus (midge)	---	----------	32	80
Hexagenia bilineata (mayfly)	---	----------	42	85
3) Salmo gairdneri (rainbow trout)	12°C	1.2 (0.7 - 1.6)		
3) Pimephales promelas (fathead minnow)				471
3) Ictalurus punctatus (channel catfish)	20°C	2.3 (1.2 - 4.4)		120
3) Lepomis macrochirus (bluegill)	20°C	1.7 (1.2 - 2.3)		91
Lepomis megalophus (longear sunfish)				297

1) Bioconcentration factor, first value is from water concentration of 75 ppm, the second 28 ppm.
2) 48-hr EC_{50}
3) Meet guideline requirements for acute toxicity test.
4) 60-day bioconcentration test.

CONCLUSION: The studies are scientifically sound based on the referenced protocol. The ones which are not marked as fulfilling guideline requirements are done with species not normally used for tests by this branch. They do provide useful information.

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101.3 Determination of Bioconcentration Factor and Partition Coefficient

CITATION: Kanazawa, Jun. 1981. Measurement of Bioconcentration Factors of Pesticide by Freshwater Fish and their correlation with Physicochemical Properties or Acute Toxicities. In Pestic. Sci. 1981, 12, 417-424.

RESULTS: The bioconcentration factor was determined to be 170 x. The partition coefficient (octanol/water) was 2650.

REVIEWERS CONCLUSION: The study may provide useful information, EAB has not validated the study. Based on the data reported, thiobencarb does not seem to bioaccummulate. The study does not fulfill any guideline requirements for fish and wildlife safety.

101.4 Define Behavior of Bolero in a Model Aquatic Ecosystem

CITATION: Barrows, Michael E. 1974. Kenetics of 14C-XE-362 in a Model Aquatic Ecosystem. A research report submitted to Chevron.

RESULTS: Water concentrations of about 0.518 ppm did not seem to cause observeable harmful effects to catfish and crayfish during 49 days exposure. The bioconcentration factors during the study were 167x in catfish and 35x in crayfish.

REVIEWERS CONCLUSION: This study was not reviewed by EAB but the results suggest Bolero is persistent when it binds to soil and desorbs into water slowly maintaining a residue level of about 500 ppb. It is not toxic to crayfish or catfish at this level and does not appear to bioaccumulate.

The portions of the test EEB can validate are considered supplemental.

101.5 Water Residue Monitoring for Benthiocarb

CITATION: Ishikawa, Kanji; Oishi, Toshitaru and Kojima, Kenichi. 1975. Benthiocarb: Studies on Residue Level & Behavior in Selected Irrigation Creeks in Agricultural Areas in Saga Pref., Southwestern Japan. Prepared by Life Science Research Inst. Kumia Chemical Industry Co., Ltd. Japan.

RESULTS: The highest residue level occurred at station 3 (see map in attached report) and was 0.040 ppm. Levels at all stations declined to low levels (less than 1 ppb) by September 9.

REVIEWERS CONCLUSION: This study provides some useful information although it has not been reviewed by EAB. It shows that Benthiocarb (or Thiobencarb) can reach levels of 40 ppb in water after direct application of 30 kg granules per hectare (2.1 kg a.i./hectare). The residues decreased by 1/2 in less than a month showing that Benthiocarb does not persist extremely long in the environment.

101.6 Aquatic Field Residue Monitoring and Fish Bioaccumulation Studies

CITATION: Finlayson, B.J. and T.L. Lew, 1983. Rice Herbicide Concentrations in Sacramento River and Associated Agricultural Drains, 1982. Published by the California Department of Fish and Game, Resources Agency. Environmental Services Branch, Administration Report 83-5.

RESULTS: Concentrations of thiobencarb were detected in the waters from most of the agricultural drains by May 21, peaked during the first to second week of June, and subsided to less than detectable concentrations by July 7, 1982. Maximum thiobencarb concentrations (ppb) measured were 170 at CBD5, 100 at NDl and RDl08, 30 to 40 at RSl and SBPl, and 10 at BSl. See Figure 1, map. Estimated bioconcentration factors (BCF) for skeletal muscle of fish ranged from 9X to 311X for thiobencarb.

REVIEWERS CONCLUSION: This study is scientifically sound and provides useful information on the behavior of thiobencarb in the environment. It shows that thiobencarb does move from rice fields where it was applied to adjacent streams and rivers. But the study does not show bioaccumulation in fish to be a problem. It does not fulfill any guideline requirements at this time.

101.7 Acute Toxicity with Mosquito Fish

CITATION: Studies on the Potential Environmenal Impact of the Herbicide Thiobencarb (Bolero). C.H. Schaufer, T. Miura, R.J. Stewart, E.F. Dupras, Jr. Mosquito Control Research Laboratory, University of California, Fresno, CA.

Species: Mosquito fish (Gambusia affinis)

REPORTED RESULTS:
96-hr LC_{50}=3 ppm (static)
=1.3 ppm (continuous flow)
Residue accumulation=200x in 24 hr.
Field study- no significant effects on mosquito fish, some reaction of plankton and nekton.

REVIEWERS CONCLUSION: The lab toxicity study and the field study are not scientifically sound and cannot be used in risk assessment. The bioaccumulation study was not validated.

103 Conclusions

The studies will be placed in the EEB file along with the Field Study progress report updates. They will be used to perform a final hazard assessment on the use of Bolero on rice when the field study is completed.

Daniel Rieder 4/25/84
Daniel Rieder
Wildlife Bilogist
Section 2, EEB

Ann Stavola 4/25/84
Ann Stavola
Aquatic Biologist
Section 3, EEB

Norman Cook 4.26.84
Norm Cook, Section Head
Section 2
Ecological Effects Branch, HED

Clayton D Bushong 4/26/84
Clayton Bushong, Chief
Ecological Effects Branch
Hazard Evaluation Division

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