very interesting 10-27-83

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SHAUGHNESSEY NO. _____ REVIEW NO.

EEB BRANCH REVIEW

OCT 27 1983

DATE: IN 7-15-83 OUT _____

FILE OR REG. NO. 707-104

PETITION OR EXP. PERMIT NO. _____

DATE OF SUBMISSION 6-30-83

DATE RECEIVED BY HED 7-14-83

RD REQUESTED COMPLETION DATE 11-3-83

EEB ESTIMATED COMPLETION DATE 10-27-83

RD ACTION CODE/TYPE OF REVIEW 401/Data

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

DATA ACCESSION NO(S). _____

PRODUCT MANAGER NO. R. Taylor (25)

PRODUCT NAME(S) Stam M-4

COMPANY NAME Rohm and Haas Company

SUBMISSION PURPOSE Submission of further aquatic data for review by EEB

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

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

28 OCT 1983

OFFICE OF
PESTICIDES AND TOXIC SUBSTANCES

MEMORANDUM

TO: R. Taylor
Product Manager (25)
Registration Division, TS-767

THRU: for Harry Craven
Section Head
Ecological Effects Branch
Hazard Evaluation Division, TS-769

THRU: Clayton Bushong
Branch Chief
Ecological Effects Branch
Hazard Evaluation Division, TS-769

SUBJECT: Stam M-4: Evaluation of additional data requested by EEB (Johnson 2/17/83).

The registrant, Rohm & Haas Co., has submitted additional data for an embryo-larvae test (Acc. no. 250694) that was reviewed previously by the Ecological Effects Branch (Johnson 2/17/83). This information (table 1) listed the percentage hatch of embryos and survival of larval fathead minnow (Pimephales promelas) exposed to STAM applied to soil.

A one-way analysis of variance (ANOVA) was performed by the Ecological Effects Branch (EEB) to evaluate data on embryo hatchability. The percentage hatch in each duplicate was transformed to arc sine prior to conducting the ANOVA. Differences due to treatment were considered significant if the calculated F value was greater than the expected (table) F with a probability level or error of $P \leq 0.05$.

Using the SAS linear computer model, EEB noted a significant difference due to treatment (Table 2). The test statistic for hatchability was calculated as follows:

$$F^* = \frac{MSTR}{MSE} = \frac{148.8}{16.6} = 8.84$$

expected F = 3.97

Therefore, $F^* = 8.84 > 3.97$, we concluded that a significant difference existed between toxicant levels and controls. A multiple comparison procedure (Duncan's) was employed to determine at which toxicant level a difference between means existed. These results suggested that hatchability was significantly effected at concentration level 134 ug/cm^2 batch 9287 (12 lb/A).

Analysis of percentage survival and growth were not possible because all test organisms died within four days posthatch. Information in this study is of limited usefulness in performing a hazard assessment.

Reviewers Evaluation:

The embryo-larvae study (Acc. no. 250694) pertaining to soil treated STAM M-4 appears scientifically sound, but, will not support Registration. The levels of STAM M-4 comparable to and in excess of normal field usage are very highly toxic to embryos and larvae of developing fish. A valid embro-larvae test, that indicates a "no-effect" level is still necessary for the completion of several EEB hazard evaluations.

Category: Supplemental

Repairability: N /A.

Miachel Rexrode
Fishery Biologist
Ecological Effects Branch
Hazard Evaluation Division, TS-769

Table 1. Percentage Hatch of Embryos and Survival of Larval Fathead Minnows (Pimephales promelas) Exposed to STAM Applied to Soil.

Treatment	Replicate	Percentage Hatch	Percentage Survival
[1]134 ug/cm^2; lot #9287 (12 lb/A)	A	77	0
	13	75	0
[1]134 ug/cm^2; lot #9287, dry soil (12 lb/A)	A	98	0
	B	98	0
[2]67 ug/cm^2; lot #9287 (6 lb/A)	A	97	0
	B	100	0
[2]134 ug/cm^2; lot #3143 (12 lb/A)	A	98	0
	B	93	0
[1]soil-control	A	98	88
	B	95	90
[2] control	A	98	90
	B	95	92

[1] Test series terminated after 8 days of larval exposure

[2] Test series terminated after 3 days of larval exposure

Table 2. Analysis of Variance Table and Multiple Comparison (Duncan's) Procedure Evaluating Fathead Minnow (Pimephales promelas) Hatchability after Exposure to STAM Applied to soil

GENERAL LINEAR MODELS PROCEDURE

DEPENDENT VARIABLE: RESPONSE

SOURCE	DF	SUM OF SQUARES	MEAN SQUARE	F VALUE
MODEL	5	734.24634167	146.84926833	8.84
ERROR	6	99.63415000	16.60569167	PR > F
CORRECTED TOTAL	11	833.88049167		0.0097

R-SQUARE	C.V.	ROOT MSE	RESPONSE MEAN
0.880517	5.2607	4.07500818	77.46083333

SOURCE	DF	TYPE I SS	F VALUE	PR > F
TRT	5	734.24634167	8.84	0.0097

SOURCE	DF	TYPE III SS	F VALUE	PR > F
TRT	5	734.24634167	8.84	0.0097

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GENERAL LINEAR MODELS PROCEDURE

DUNCAN'S MULTIPLE RANGE TEST FOR VARIABLE: RESPONSE
NOTE: THIS TEST CONTROLS THE TYPE 1 COMPARISONWISE ERROR RATE,
NOT THE EXPERIMENTWISE ERROR RATE.
OALPHA=0.05 DF=6 MSE=16.6057
OMEANS WITH THE SAME LETTER ARE NOT SIGNIFICANTLY DIFFERENT.

DUNCAN GROUPING	MEAN	N	TRT
A	85.010	2	Y
A			
A	81.870	2	X
A			
A	79.475	2	C
A			
A	79.475	2	SC
A			
A	78.265	2	Z
B	60.670	2	W