2/27/90 File 129016--

8.

DATA EVALUATION RECORD

1.) CHEMICAL: XRM-5019 (sulfonylurea herbicide)

2.) TEST MATERIAL: XRD-498, 99.6% active ingredient. The formulated product XRM-5019 contains 74.9% active ingredient.
EPA No. 464-EUP-RNG; PM-23.

3.) STUDY TYPE: Acute toxicity to the grass shrimp under flow-through conditions.

4.) CITATION: Manning, S. C. 1988. XRD-498 Herbicide: Acute Toxicity To Grass Shrimp (Palaemonetes vulgaris) Under Flow-Through Conditions. Hunter ESE Inc. Gainesville, Fl.
MRID: 412632-26

5.) REVIEWED BY:
Richard C. Petrie
Agronomist
EEB/EFED

Signature: Richard C Petrie
Date: 2/27/90

6.) APPROVED BY:
Ann Stavola
Head, Section 3
EEB/EFED

Signature: Ann Stavola
Date: 2/27/90

7.) CONCLUSIONS:
This study is scientifically sound and is acceptable for use in hazard assessments (CORE). Solubility above 353 ppm was not achieved for the test material. The LC50 level of >350 mg/L was determined for the grass shrimp. XRD-498 is categorized as "practically non-toxic" to the grass shrimp.

8.) RECOMMENDATIONS:
N/A

9.) BACKGROUND:
No background information was found in EEB files.

10.) DISCUSSION OF INDIVIDUAL TESTS:

11.) MATERIALS AND METHODS:

A. TEST ANIMALS

Grass shrimp were obtained from an estuary near St. Augustine, Fl. and taxonomically verified. The shrimp were maintained in the lab for 9 days prior to test initiation in natural seawater. They were fed brine shrimp naupoii (Artemia salina) and maintenance flakes from Novelek, Inc. for 6 days. Mortality was less than 1% during the 48 hours preceeding the study.

B. DOSAGE

Zero, 48, and 96 hour concentrations were measured with HPLC.

	DOSAGES
Nominal:	400,240,144, 86, 52 mg/L
Measured 0hr:	352,210,124, 72, 37 mg/L
Measured 48hr:	343,211,130 77, 53,mg/L
Measured 96hr:	353,208,128, 80, 48 mg/L
Measured Mean:	349,210,127, 76, 46 mg/L
Mean % of Nominal:	87, 88, 88, 88, 88 %

C. STUDY DESIGN

The test system consisted of 6 glass aquaria designed to maintain 9 liters of test solution. No solvents were used in this 96 hour flow-through test. The dilution factor was 0.6 and the flow rate was adjusted to provide 8.3 turn-overs daily. Daily water temperature ranged from 20 to 22 degrees C. Salinity of water ranged from 20 to 22 ppthousand. DO was >95% of saturation throughout the study. The pH ranged from 6.7 to 7.7. Photoperiod was 14 hours light/ 10 hours dark. The shrimp were not fed during the test. The DO, pH, temperature, and salinity levels were recorded daily.

D. STATISTICAL ANALYSIS

No analyses were conducted.

12.) REPORTED RESULTS:

The measured concentrations at day 0 ranged from 37 to 352 mg/L. The pH ranged from 6.9 to 7.7 during the study. The test substance was stable with final concentrations 88% of first day measured concentrations. Maximum solubility was attained at 353 ppm. The LC50 was determined to be approximately 350 mg/L. Control mortality was zero for the 96 hour period. XRD-498 is classified as "practically non-toxic" to grass shrimp.

	Number Dead (%)			
Test Conc. (mg/L)	24 hr.	48 hr.	72 hr.	96 hr.
400 (349)*	0	0	0	5**
240 (210)	0	0	0	0
144 (127)	5	5	5	5
86 (76)	0	0	0	0
52 (46)	0	0	0	0
control	0	0	0	0

* Mean measured concentration (0, 48, 96 hours)
** 5% mortality = 1 dead

No sublethal effects were observed during the 96 hour exposure period at any test level.

13.) STUDY AUTHOR'S CONCLUSIONS/QUALITY ASSURANCE MEASURES:

Due to the low mortality, statistical analysis was not possible. By observation, solubility was attained at 353 mg/L. Test results could not be correlated with measured concentrations, salinity, DO levels, pH levels, temperature, or photoperiod. A 65% effect was not achieved at any dose. The XRD-498 technical 96 hour LC50 for the grass shrimp appears to be greater than 350 mg/L. This level is categorized as "practically non-toxic" to the grass shrimp.

Four deviations from protocol occurred as follows:

1.) The test was conducted at 14 hours light/ 10 hours dark photoperiod. The photoperiod was adjusted for an adjacent mysid chronic study.

2.) The test temperature deviated to 20 degrees C for 4 hours and to 24 degrees C for 1 hour (Approximately 5% of total time).

3.) The test shrimp were held for 9 days which does not deviate from test protocol but does deviate from EPA/SEP of 10 days. The exception is reportedly due to cannibalism during holding.

4.) The shrimp were fed brine shrimp nauplei on one day during the holding period instead of a commercial flake food required in the protocol.

14.) REVIEWER'S DISCUSSION AND INTERPRETATION OF STUDY RESULTS:

A. Test Procedure:

Except for the 4 deviations listed above, this study was generally in compliance with EPA GLP standards. The deviations listed above are not believed to significantly alter test results.

B. Statistical Analysis:

No statistical analysis was possible due to low mortality at the highest dose tested. By inspection the LC50 for the grass shrimp is greater than 100 ppm, "practically non-toxic".

C. Discussion/Results:

This study is judged scientifically sound and acceptable for use in a hazard assessment.

D. Adequacy Of The Study:

(1) Classification: Core
(2) Rationale: N/A
(3) Repairability: N/A