July 7/18/88

MRID Number 263581

DATA EVALUATION RECORD

1. **CHEMICAL:** 1,2-dibromo-2,2-dichoroethyl dimethyl phosphate; Naled Technical

2. **TEST MATERIAL:** Naled Technical; 90 percent purity; Lot Number SX-1554

3. **STUDY TYPE:** Mollusc 96-hour Flow-Through Shell Deposition Study
Test Species: (Crassostrea virginica) Eastern Oyster

4. **CITATION:** Surprenant, D.C. 1986. Acute Toxicity of Naled Technical to Eastern Oysters (Crassostrea virginica). Bionomics Report #BW-86-04-1970. Prepared by Springborn Bionomics, Inc., Wareham, Massachusetts. Submitted by Chevron Environmental Health Center, Inc. Richmond, California. MRID Number 263581.

5. **REVIEWED BY:**

Brian A. Wade
Aquatic Toxicologist
ESE

Signature: Brian A. Wade
Date: 5-11-88

6. **APPROVED BY:**

Isabel C. Johnson, M.S.
Principal Scientist
KBN Engineering and
Applied Sciences, Inc.

Signature: Isabel C. Johnson
Date: May 12, 1988

for Henry T. Craven
Supervisor, EEB/HED
USEPA

Signature: John Noles
Date: 7/18/88

7. **CONCLUSIONS:** This Study is scientifically sound. With a 96-hour EC50 value of 0.19 (0.11-0.29) mg/L, Naled Technical is considered highly toxic to the Eastern Oyster, (Crassostrea virginica). This study should be considered core.

8. **RECOMMENDATIONS:** N/A

9. BACKGROUND:

10. DISCUSSION OF INDIVIDUAL TESTS: N/A

11. MATERIALS AND METHODS:

A. Test Animals: Eastern Oysters (Crassostrea virginica) were obtained from a commercial supplier on Cape Cod, Massachusetts. Oysters had a mean valve height of 37 ± 5 mm and mean weight of 5.18 ± 2.22 grams.

B. Test System: The test was conducted for 96 hours under flow-through conditions. Five test concentrations, with a dilution factor of 0.56, a solvent control and a seawater control were tested. All treatments, and controls were tested in duplicate. Replicate test aquaria were 60x30x30-cm and equipped with a 10-cm high stand pipe for a resident test solution volume of 18 liters. Flow rate to each test aquarium was 75 mL/minute, which provide approximately six volume replacements in 24 hours. The stock was introduced to the system via a syringe pump calibrated to deliver 0.02 mL/minute of stock solution into 0.34 liter of unfiltered seawater, which was then proportionally diluted in the continuous flow diluter.

C. Dosage: A 96-hour flow-through study was conducted. Flow-through was a continuous flow proportional diluter with a 56-percent dilution factor.

D. Design: Twenty oysters were used in each test aquaria, and test concentrations were duplicated (40 oysters per test concentration). An unfiltered control and solvent control were tested in duplicate concurrently. Nominal, uncorrected for percent active ingredient, (and measured) concentrations tested were: 0.059(0.025); 0.10(0.04); 0.19(0.061); 0.34(0.15) and 0.6(0.22) mg/L of Naled Technical.

E. Statistics: A computer program developed at the testing laboratory was utilized to compute four linear regression curves based on least squares. Percentage reduction in growth data were transformed to probits and concentrations to logs. Both untransformed and transformed data were regressed. The regression line which provided the best fit of the untransformed or transformed data was selected based on the highest associated coefficient of determination. The regression equation was then applied to calculate the EC50 and its 95% confidence limits.

12. REPORTED RESULTS: The reported EC50 value of 0.19 (0.11-0.29) mg/L of Naled Technical to the Eastern Oyster shows it to be highly toxic. The results of the test are reported below:

Nominal Concentration (mg/L)	Mean Measured Concentration (mg/L)	Mean Shell Deposition (mm) (std.dev.)	Percent Change
0.60	0.22	0.6 (0.5)	66
0.34	0.15	1.3 (0.8)	30
0.19	0.061	1.6 (1.0)	14
0.10	0.040	1.6 (0.8)	14
0.059	0.025	1.7 (0.8)	10
Solvent Control	N/A	1.8 (0.9)	N/A
Control	N/A	2.0 (0.7)	N/A

13. STUDY AUTHOR'S CONCLUSIONS/QUALITY ASSURANCE MEASURES: After 96 hours of exposure to Naled Technical, the EC50 value for the Eastern Oyster was 0.19 (0.11-0.29) mg/L. The data were audited by the laboratory's Quality Assurance Unit to assure compliance with protocols, standard operating procedures and pertinent EPA Good Laboratory Practice (GLP) Regulations. A GLP compliance statement was included and signed by the Quality Assurance Unit.

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

A. Test Procedure: The test procedures were in accordance with protocols recommended by the Guidelines, with the following exceptions. The first deviation was the holding time prior to test initiation. Oysters used in the study were held for 24 hours at the testing laboratory instead of 48 hours. The second deviation was the dilution factor. The dilution factor used in the test was 56-percent, instead of the recommended 60-percent or greater.

Test temperature was measured only daily compared to the recommended hourly measurements for both the acclimation and testing periods.

A flow rate of 75 ml/minute/test aquarium was utilizes providing a flow of 225 ml/oyster/hour. This rate is only about 4 percent of the rate setforth in test protocols recommended in the SEP (approximately 5 L/oyster/hour and only one quarter of the minimum rate setforth in EPA's Environmental Effects Guidelines for oyster shell deposition studies referenced by the author. To offset the reduced flow the test facility supplemented the water with the alga, Isochrysis galbana Parke at a density of 1 $x10^5$ cells/ml, and utilized pumps to recirculate test solutions at a flow rate of 5 L/oyster/hour. No mention was made of the number of checks on

algal numbers or additions made to test aquaria. It should be noted however, that a flow-through test as defined by ASTM (1980) to consist of "test solutions that flow through the test chamber on a once-through basis throughout the test" and not on a recirculated flow.

B. Statistical Analysis: The reviewer estimated an EC50 value of 0.19 mg/L by graphic interpolation which is identical to that calculated by the study's author.

C. Discussion/Results: With an EC50 value of 0.19 (0.11-0.29) mg/L, Naled Technical is classified as highly toxic to the Eastern Oyster (Crassostrea viginica).

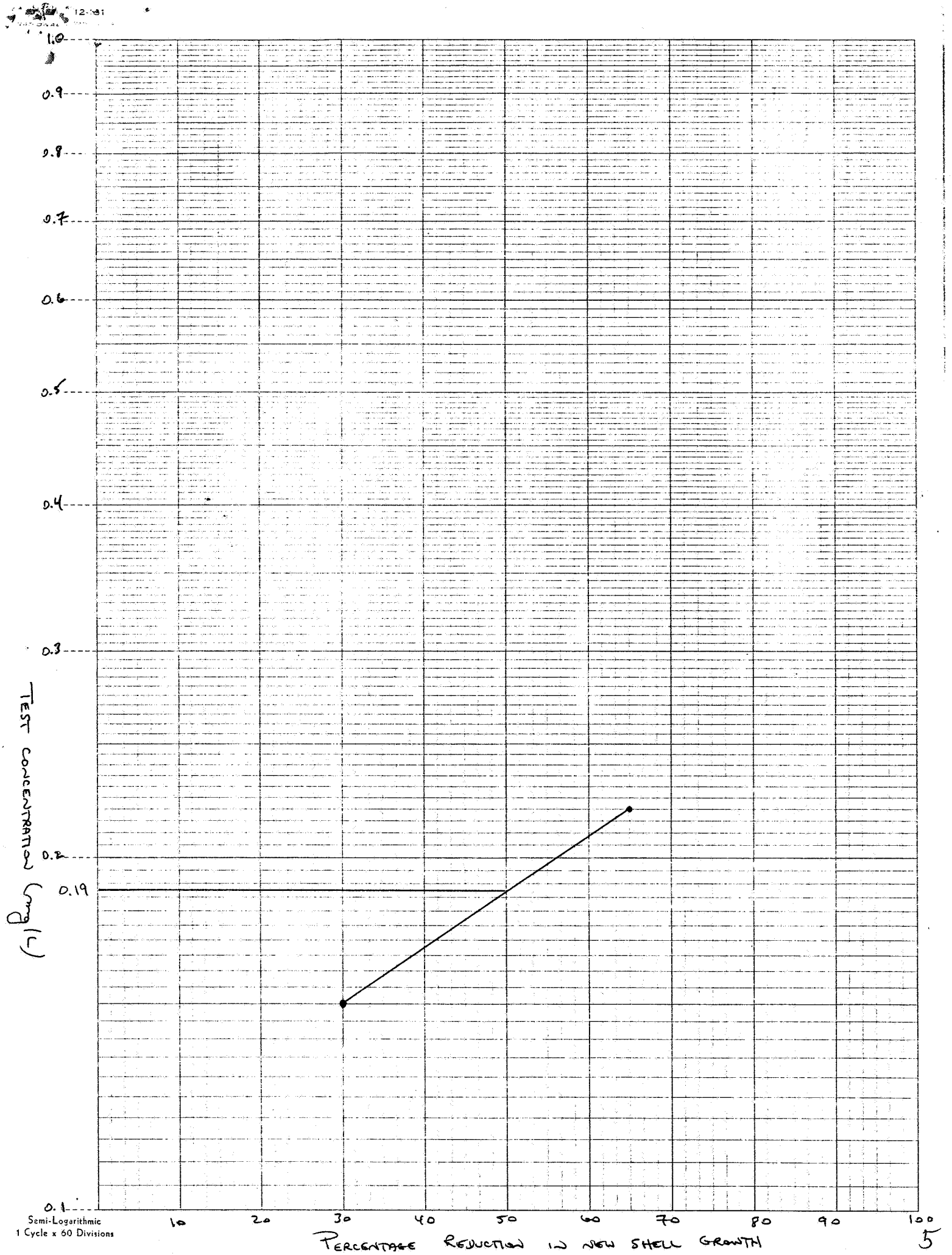
D. Adequacy of the Study:

(1) Classification: Core

(2) Rationale: Even with the deviations from protocol, the study is scientifically sound. The deviations do not detract from the study's soundness.

(3) Repairability: N/A

15. COMPLETION OF ONE-LINER FOR STUDY: Yes, 5-11-88.



Semi-Logarithmic
1 Cycle x 60 Divisions