Data Evaluation Report
Ecological Effects Branch

1. **Chemical:** Propetamphos

2. **Test Material:** Propetamphos technical, purity 90%, Lot No. Z-19389

3. **Study Type:** 48 Hour Flow-through Acute Toxicity Test using Daphnia magna.

4. **Study Identification:**
   Study Director: Burgess, David
   Study Laboratory: Analytical Bio-Chemistry Laboratories, Columbia, Missouri
   Study Dates: July 10-12, 1990
   Study Identification: ABC Study No. 38677
   Sponsor: Zoecon Corporation, Dallas, Texas
   EPA Identification: MRID 416074-01

5. **Reviewed By:** Brian Montague, Fisheries Biologist
   Ecological Effects Branch
   Environmental Fate and Effects Division(H7507C)

   Brian Montague 1/9/91

6. **Approved By:** Les Touart, Acting Head/Section I
   Ecological Effects Branch
   Environmental Fate and Effects Division

   L. T. 1/14/91

7. **Conclusions:** With an estimated LC_{50} value of 3.3 (Cl's 1.8 and 4.2) ppb propetamphos technical is shown to be highly toxic to freshwater invertebrate life. The estimated NOEL is 0.98 ppb.

8. **Recommendations:** N/A

9. **Submission Purpose:** Submitted in response to reregistration guideline requirements.

10. **Protocol and Study Design:** Protocol was ABC Protocol 8101-SEP. This protocol is based on ASTM's Methods For Acute Toxicity Tests with Fish, Macroinvertebrates, and Amphibians.

Test Organisms: Daphnia magna were obtained from laboratory cultures maintained since 1977. Daphnids were held in temperature controlled room maintained at 20 ± 2°. A 16 hour daylight photoperiod with 30 minute transition was maintained at 50-70 foot candle intensity. All daphnids were ≤24 hours old and first instars at test initiation. Food was withheld during testing.

Test Solution Preparation: Diluter stock solution was prepared by addition of 0.0563 gms. of test material to acetone brought to a 10 ml volume. This 5000 mg/L stock solution was then prepared to a 38 ppm concentration by addition of 0.76 ml to a volumetric flask brought to 100 ml of volume with acetone.

Test Methods and Materials: The test solution was supplied to the 1000 ml glass beakers (test vessels) via a Mount and Brungs designed half liter proportional diluter system equipped with Hamilton MicroLab 420 syringe dispensers. The test design employed 4 replicates in each of the control, solvent control, and 5 test concentration (0.23, 0.46, 0.95, 1.9, and 3.8 ppb)groups. These concentrations were chosen after preliminary testing at 0.90, 1.8, 3.8, 7.5 and 15 ppb had produced excessive mortality. Prior to introduction of daphnids test solution was allowed to flow through the system and mix with the dilution water (hard blended water prepared with ABC well water and reverse osmosis water - 160-180 mg/L as $CaCO_3$). Volume replacement rate was 5 additions per day (24 hours). Test vessels were immersed in a temperature controlled water bath maintained at 20°C. A 16D/8N photoperiod was employed at a 56 footcandle intensity level. Observations of behavior and mortality were made at 24 and 48 hours. Five daphnia were used in each test vessel (20 per concentration level). Samples of test water were taken at 0 and 48 hours for later analysis by gas liquid chromatography.

11. **Reported Test Results:** Measurement of concentrations of propetamphos in the test vessels yielded mean recovery rates of 95 to 135% of the nominal concentrations. Mean measured concentration levels were 4.2, 1.8, 0.98, 0.52, and 0.31 ppb. After 24 hours a 25% mortality was recorded in the 4.2 ppb

level with no other adverse reactions reported for the lower test concentrations. After 48 hours a 75% mortality was seen in the 4.2 ppb level. Abnormal swimming behavior was recorded in the 1.8 ppb level at this time but no effects were seen in concentrations below this level or in control vessels. The test material appeared stable and no precipitate or film was observed in the test vessels. Temperature ranged between 20 and 21°C and dissolved oxygen remained above 7.7 mg/L for the entire test period. The pH dropped from 8.3 to 8.0 during the 48 hour test.

12. **Study Author's Conclusions:** "The 24-hour and 48-hour LC_{50} values for Propetamphos based on mortality were >4.2 and 3.3 mg/L, respectively... The no effect level based on lack of mortality or other abnormal effects was considered to be 0.98 mg/L after 48 hours.

13. **Reviewer's Discussion:** The test appears to have satisfied the guideline requirements for testing of freshwater invertebrate life under flow through conditions. It would have been preferable if 100% mortality had been obtained in one of the higher test levels. Though two mortalities did occur in the 0.52 ppb test group, no mortalities occurred in the 0.98 or 0.31 ppb test levels thus indicating that these were probably not dose related. Statistical analysis by the Agency has confirmed the study director's conclusions. Propetamphos technical has been shown to be very highly toxic to Daphnia magna under flow-through conditions.

Adequacy of Study:

Classification: Core

Rationale: The reported test results support the study author's conclusions.

Repairability: N/A