1-EEB-11D
1/11/99

MRID No. 445870-03

DATA EVALUATION RECORD
AQUATIC INVERTEBRATE LIFE CYCLE TEST
GUIDELINE 72-4

1. **CHEMICAL:** D-Phenothrin PC Code No.: 069005

2. **TEST MATERIAL:** Sumithrin TG Purity: 92.8%

3. **CITATION:**

Author: A.E. Putt
Title: Sumithrin - The Chronic Toxicity to *Daphnia magna* Under Flow-Through Conditions
Study Completion Date: March 27, 1998
Laboratory: Springborn Laboratories, Inc., Wareham, MA
Sponsor: Sumitomo Chemical Company, Osaka, Japan
Laboratory Report ID: 98-2-7248
MRID No.: 445870-03
DP Barcode: D247482

4. **REVIEWED BY:** Mark Mossler, M.S., Toxicologist, Golder Associates Inc.

Signature: Mark Mossler **Date:** 1/8/99

APPROVED BY: Pim Kosalwat, Ph.D., Senior Scientist, Golder Associates Inc.

Signature: P. Kosalwat **Date:** 1/8/99

5. **APPROVED BY:**

Signature: **Date:**

6. **STUDY PARAMETERS:**

Age of Test Organism: ≤24 hours
Definitive Test Duration: 21 days
Study Method: Flow-Through
Type of Concentrations: Mean Measured

7. **CONCLUSIONS:** This study is scientifically sound and fulfills the guideline requirements for a freshwater invertebrate life-cycle test.

Results Synopsis: Most sensitive endpoint - reproduction

NOEC: 0.47 ppb ai LOEC: 0.81 ppb ai MATC: 0.62 ppb ai

21-day daphnid survival
File: dam Transform: ARC SINE(SQUARE ROOT(Y))

STEEL'S MANY-ONE RANK TEST - Ho:Control<Treatment

GROUP	IDENTIFICATION	TRANSFORMED MEAN	RANK SUM	CRIT. VALUE	df	SIG
1	Sol. Con.	1.371				
2	0.13 ppb ai	1.371	18.00	10.00	4.00	
3	0.23 ppb ai	1.412	20.00	10.00	4.00	
4	0.47 ppb ai	1.371	18.00	10.00	4.00	
5	0.81 ppb ai	1.336	17.50	10.00	4.00	
6	2.1 ppb ai	0.159	10.00	10.00	4.00	*

Critical values use k = 5, are 1 tailed, and alpha = 0.05

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Reproduction (per ♀ repro. day)
File: dam Transform: NO TRANSFORMATION

WILLIAMS TEST (Isotonic regression model) TABLE 1 OF 2

GROUP	IDENTIFICATION	N	ORIGINAL MEAN	TRANSFORMED MEAN	ISOTONIZED MEAN
1	Sol. Con.	4	8.833	8.833	8.833
2	0.13 ppb ai	4	7.775	7.775	8.158
3	0.23 ppb ai	4	7.760	7.760	8.158
4	0.47 ppb ai	4	8.938	8.938	8.158
5	0.81 ppb ai	4	6.188	6.188	6.188

Reproduction
File: dam Transform: NO TRANSFORMATION

WILLIAMS TEST (Isotonic regression model) TABLE 2 OF 2

IDENTIFICATION	ISOTONIZED MEAN	CALC. WILLIAMS	SIG P=.05	TABLE WILLIAMS	DEGREES OF FREEDOM
Sol. Con.	8.833				
0.13 ppb ai	8.158	0.767		1.75	k= 1, v=15
0.23 ppb ai	8.158	0.767		1.84	k= 2, v=15
0.47 ppb ai	8.158	0.767		1.87	k= 3, v=15
0.81 ppb ai	6.188	3.005	*	1.88	k= 4, v=15

s = 1.245
Note: df used for table values are approximate when v > 20.

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TRT=1

= SOLVENT CONTROL

Variable	N	Mean	Std Dev	Minimum	Maximum
LENGTH	39	5.0410256	0.1859796	4.5000000	5.3500000
WEIGHT	39	1.1164103	0.1644686	0.7700000	1.5000000

TRT=2

= 0.13 ppb ai

Variable	N	Mean	Std Dev	Minimum	Maximum
LENGTH	39	4.9461538	0.2237199	3.9000000	5.2500000
WEIGHT	39	1.1064103	0.2122373	0.4100000	1.4800000

TRT=3

= 0.23 ppb ai

Variable	N	Mean	Std Dev	Minimum	Maximum
LENGTH	40	4.9887500	0.1619146	4.3500000	5.2500000
WEIGHT	40	1.1027500	0.1473177	0.8200000	1.4600000

TRT=4

= 0.47 ppm ai

Variable	N	Mean	Std Dev	Minimum	Maximum
LENGTH	39	4.9487179	0.2437339	3.9000000	5.3000000
WEIGHT	39	1.0061538	0.1737908	0.5300000	1.3900000

TRT=5

= 0.81 ppm ai

Variable	N	Mean	Std Dev	Minimum	Maximum
LENGTH	38	4.9973684	0.1580914	4.5000000	5.2500000
WEIGHT	38	1.2350000	0.1417602	0.6700000	1.4900000

General Linear Models Procedure
Class Level Information

Class	Levels	Values
TRT	5	1 2 3 4 5
REP	4	1 2 3 4

Number of observations in data set = 195

General Linear Models Procedure

Dependent Variable: LENGTH

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	7	0.9585412	0.1369345	3.82	0.0007
Error	187	6.7012536	0.0358356		
Corrected Total	194	7.6597949			

R-Square	C.V.	Root MSE	LENGTH Mean
0.125139	3.797938	0.1893	4.9844

Source	DF	Type I SS	Mean Square	F Value	Pr > F
TRT	4	0.2389026	0.0597256	1.67	0.1595
REP	3	0.7196387	0.2398796	6.69	0.0003

Source	DF	Type III SS	Mean Square	F Value	Pr > F
TRT	4	0.2451960	0.0612990	1.71	0.1494
REP	3	0.7196387	0.2398796	6.69	0.0003

General Linear Models Procedure

Dependent Variable: WEIGHT

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	7	1.0528879	0.1504126	5.17	0.0001
Error	187	5.4415254	0.0290991		
Corrected Total	194	6.4944133			

R-Square	C.V.	Root MSE	WEIGHT Mean
0.162122	15.33114	0.1706	1.1127

Source	DF	Type I SS	Mean Square	F Value	Pr > F
TRT	4	1.0171479	0.2542870	8.74	0.0001
REP	3	0.0357401	0.0119134	0.41	0.7464

Source	DF	Type III SS	Mean Square	F Value	Pr > F
TRT	4	1.0192259	0.2548065	8.76	0.0001
REP	3	0.0357401	0.0119134	0.41	0.7464

General Linear Models Procedure
Least Squares Means

TRT	LENGTH LSMEAN	Pr > |T| HO: LSMEAN(i)=LSMEAN(j) i/j	1	2	3	4	5
1	5.04324441	1	.	0.0258	0.2025	0.0326	0.3395
2	4.94690180	2	0.0258	.	0.3272	0.9251	0.2041
3	4.98875000	3	0.2025	0.3272	.	0.3759	0.7591
4	4.95093672	4	0.0326	0.9251	0.3759	.	0.2389
5	5.00192273	5	0.3395	0.2041	0.7591	0.2389	.

TRT	WEIGHT LSMEAN	Pr > |T| HO: LSMEAN(i)=LSMEAN(j) i/j	1	2	3	4	5
1	1.11660216	1	.	0.7812	0.7186	0.0048	0.0026
2	1.10585369	2	0.7812	.	0.9357	0.0108	0.0010
3	1.10275000	3	0.7186	0.9357	.	0.0129	0.0007
4	1.00634575	4	0.0048	0.0108	0.0129	.	0.0001
5	1.23539391	5	0.0026	0.0010	0.0007	0.0001	.

TE: To ensure overall protection level, only probabilities associated with pre-planned comparisons should be used.

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General Linear Models Procedure

Bonferroni (Dunn) T tests for variable: LENGTH

NOTE: This test controls the type I experimentwise error rate but generally has a higher type II error rate than Tukey's for all pairwise comparisons.

Alpha= 0.05 Confidence= 0.95 df= 187 MSE= 0.035836
Critical Value of T= 2.84073

Comparisons significant at the 0.05 level are indicated by '***'.

TRT Comparison	Simultaneous Lower Confidence Limit	Difference Between Means	Simultaneous Upper Confidence Limit
1 - 5	-0.07892	0.04366	0.16623
1 - 3	-0.06874	0.05228	0.17329
1 - 4	-0.02947	0.09231	0.21409
1 - 2	-0.02691	0.09487	0.21665
5 - 1	-0.16623	-0.04366	0.07892
5 - 3	-0.11320	0.00862	0.13044
5 - 4	-0.07393	0.04865	0.17123
5 - 2	-0.07136	0.05121	0.17379
3 - 1	-0.17329	-0.05228	0.06874
3 - 5	-0.13044	-0.00862	0.11320
3 - 4	-0.08098	0.04003	0.16105
3 - 2	-0.07842	0.04260	0.16361
4 - 1	-0.21409	-0.09231	0.02947
4 - 5	-0.17123	-0.04865	0.07393
4 - 3	-0.16105	-0.04003	0.08098
4 - 2	-0.11921	0.00256	0.12434
2 - 1	-0.21665	-0.09487	0.02691
2 - 5	-0.17379	-0.05121	0.07136
2 - 3	-0.16361	-0.04260	0.07842
2 - 4	-0.12434	-0.00256	0.11921

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General Linear Models Procedure

Bonferroni (Dunn) T tests for variable: WEIGHT

NOTE: This test controls the type I experimentwise error rate but generally has a higher type II error rate than Tukey's for all pairwise comparisons.

Alpha= 0.05 Confidence= 0.95 df= 187 MSE= 0.029099
Critical Value of T= 2.84073

Comparisons significant at the 0.05 level are indicated by '***'.

TRT Comparison	Simultaneous Lower Confidence Limit	Difference Between Means	Simultaneous Upper Confidence Limit	
5 - 1	0.00813	0.11859	0.22905	***
5 - 2	0.01813	0.12859	0.23905	***
5 - 3	0.02248	0.13225	0.24202	***
5 - 4	0.11839	0.22885	0.33930	***
1 - 5	-0.22905	-0.11859	-0.00813	***
1 - 2	-0.09974	0.01000	0.11974	
1 - 3	-0.09539	0.01366	0.12271	
1 - 4	0.00052	0.11026	0.21999	***
2 - 5	-0.23905	-0.12859	-0.01813	***
2 - 1	-0.11974	-0.01000	0.09974	
2 - 3	-0.10539	0.00366	0.11271	
2 - 4	-0.00948	0.10026	0.20999	
3 - 5	-0.24202	-0.13225	-0.02248	***
3 - 1	-0.12271	-0.01366	0.09539	
3 - 2	-0.11271	-0.00366	0.10539	
3 - 4	-0.01245	0.09660	0.20564	
4 - 5	-0.33930	-0.22885	-0.11839	***
4 - 1	-0.21999	-0.11026	-0.00052	***
4 - 2	-0.20999	-0.10026	0.00948	
4 - 3	-0.20564	-0.09660	0.01245	

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General Linear Models Procedure

Dunnett's One-tailed T tests for variable: LENGTH

NOTE: This tests controls the type I experimentwise error for comparisons of all treatments against a control.

Alpha= 0.05 Confidence= 0.95 df= 187 MSE= 0.035836
Critical Value of Dunnett's T= 2.175

Comparisons significant at the 0.05 level are indicated by '***'.

TRT Comparison	Simultaneous Lower Confidence Limit	Difference Between Means	Simultaneous Upper Confidence Limit	
5 - 1	-0.13751	-0.04366	0.05019	
3 - 1	-0.14493	-0.05228	0.04038	
4 - 1	-0.18555	-0.09231	0.00093	
2 - 1	-0.18811	-0.09487	-0.00163	***

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General Linear Models Procedure

Dunnett's One-tailed T tests for variable: WEIGHT

NOTE: This tests controls the type I experimentwise error for comparisons of all treatments against a control.

Alpha= 0.05 Confidence= 0.95 df= 187 MSE= 0.029099
Critical Value of Dunnett's T= 2.175

Comparisons significant at the 0.05 level are indicated by '***'.

TRT Comparison	Simultaneous Lower Confidence Limit	Difference Between Means	Simultaneous Upper Confidence Limit	
5 - 1	0.03402	0.11859	0.20316	
2 - 1	-0.09402	-0.01000	0.07402	
3 - 1	-0.09715	-0.01366	0.06983	
4 - 1	-0.19428	-0.11026	-0.02624	***