DATA EVALUATION RECORD 12/2/1993

1. **CHEMICAL:** Oxyfluorfen.
Shaughnessey No. 111601.

2. **TEST MATERIAL:** Goal® Technical; Lot No. 2-0956; 71.5% active ingredient; a brown crystalline solid.

3. **STUDY TYPE:** Growth and Reproduction of Aquatic Plants -- Tier 2. Species Tested: Selenastrum capricornutum, Anabaena flos-aquae, Navicula pelliculosa, Skeletonema costatum, and Lemna gibba. 123-2 Aquatic Plant Growth

4. **CITATION:** Giddings, J.M. 1990. Goal® Technical - Toxicity to Five Species of Aquatic Plants. SLI Report No. 90-08-3417. Rohm and Haas Technical Report #34-90-59. Conducted by Springborn Laboratories, Inc., Wareham, MA. Submitted by Rohm and Haas Company, Spring House, PA. EPA MRID No. 416184-00.

5. **REVIEWED BY:**

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Signature: Louis M Rifici
Date: May 7, 1991
Charles Lewis
6/13/91

6. **APPROVED BY:**

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Date: 5/9/91

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Date: 12/2/93

7. **CONCLUSIONS:** These tests are not scientifically sound. They suffer from inconsistent analytical results and/or contamination of the control solutions with the test material, see section 14.D.(1). for the classifications of the individual studies. The 120-hour EC_{50} values of Goal Technical for Selenastrum capricornutum, Anabaena flos-aquae, Navicula pelliculosa, and Skeletonema costatum were 0.35 µg a.i./L, >2000 µg a.i./L, 0.20 µg a.i./L, and 3.15 µg a.i./L, respectively. The 14-day EC_{50} value for Lemna gibba

30 lbs

was 1.47 µg a.i./L. Under the conditions of the tests, Goal Technical would be expected to have detrimental effects on all but one (A. flos-aquae) of the five species studied when maximally applied at the present label rate (2 lb/acre).

8. **RECOMMENDATIONS:** N/A.

9. **BACKGROUND:**

10. **DISCUSSION OF INDIVIDUAL TESTS:** N/A.

11. **MATERIALS AND METHODS:**

A. **Test Species:**

1. Selenastrum capricornutum. The alga used came from laboratory stock cultures originally obtained from the Carolina Biological Supply Company, Burlington, NC. Stock cultures were maintained in 125-mL glass flasks containing 50 mL of Marine Biological Laboratory (MBL) medium (Nichols, 1973) under test conditions. Transfers to fresh medium were made approximately once or twice a week. The culture used as the inoculum for the test was transferred four days before test initiation.

2. Anabaena flos-aquae. The alga used came from laboratory stock cultures originally obtained from the Carolina Biological Supply Company. Stock cultures were maintained in Algal Assay Procedure growth medium (AAP Medium; Miller et al., 1987) in 125-mL glass flasks under test conditions. Transfers to fresh medium were made approximately once or twice a week. The culture used as inoculum in the test had been transferred three days before test initiation.

3. Navicula pelliculosa. The alga used came from laboratory stock cultures originally obtained from the Carolina Biological Supply Company. Stock cultures were maintained in 125-mL glass flasks containing 50 mL of AAP Medium under test conditions. Transfers to fresh medium were made approximately once or twice a week. The culture used as inoculum in the test had been transferred two days before test initiation.

4. Skeletonema costatum. The alga used came from laboratory stock cultures originally obtained from Bigelow Marine Laboratory, West Boothbay, ME. Stock cultures were maintained in Marine Algal Medium (USEPA, 1978), prepared with filtered natural seawater, in 125-mL glass flasks under test conditions. Transfers to

fresh medium were made approximately once or twice a week. The culture used as inoculum had been transferred five days before test initiation.

5. Lemna gibba used in the test came from laboratory stock cultures originally obtained from C.F. Cleland, USDA, Washington, DC. Stock cultures were maintained in M-type Hoagland's medium (Hillman, 1961) under continuous 3000-4000 lux illumination, and a temperature of 25°±2°C for 5 days before testing. Lighting was provided by Vita-Lite fluorescent lights. The cultures were grown in 270-mL covered crystallizing dishes containing 100 mL of medium. Transfers were made into fresh medium to once or twice a week. The culture used as inoculum for the test had been transferred eight days before the test.

B. Test System:

1. Selenastrum capricornutum. Test vessels used were sterile 250-mL glass flasks fitted with stainless steel caps which permitted gas exchange. The test medium was the same as that used for culturing (excluding EDTA) with the pH adjusted to 7.5 ±0.1. Test vessels were maintained on an orbital shaker (shaking rate of 100 rpm) under continuous illumination (approximately 3.5-5.0 klux at the surface of the media) in a growth chamber. The temperature in the growth chamber was maintained at 24°-26°C.

2. Anabaena flos-aquae. Test vessels used were sterile 125-mL glass flasks fitted with stainless steel caps. The test medium was the same as that used for culturing (excluding EDTA) with the pH adjusted to 7.5 ± 0.1. Test vessels were maintained on an orbital shaker (shaking rate of 100 rpm) under continuous illumination (approximately 1.2-2.2 klux at the surface of the media) in a growth chamber. The temperature in the growth chamber was 25°-26°C.

3. Navicula pelliculosa. Test vessels used were sterile 250-mL glass flasks fitted with stainless steel caps. The test medium was the same as that used for culturing (excluding EDTA) with the pH adjusted to 7.5 ±0.1. Test vessels were maintained on an orbital shaker (shaking rate of 100 rpm) under continuous illumination (approximately 3.5-5.0 klux at the surface of the media) in a growth chamber. The temperature in the growth chamber was maintained at 24°-26°C.

4. Skeletonema costatum. Test vessels used were

sterile 125-mL glass flasks fitted with stainless steel caps. The test medium was the same as that used for culturing (excluding EDTA) with the pH adjusted to 8.1 ±0.1. Test vessels were maintained on an orbital shaker (shaking rate of 60 rpm) in a growth chamber. Lighting was provided on a 16-hour light:8-hour dark photoperiod with an intensity of 4.0-5.0 klux at the surface of the media. The temperature in the growth chamber was maintained at 20°-22°C.

5. Lemna gibba. The test vessels and medium used were the same as those used in culturing. The test medium (excluding EDTA) was pH adjusted to 5.1 prior to test solution preparation. The test was conducted in a growth chamber under conditions similar to those used in culturing. The temperature in the growth chamber was maintained at 22°-27°C. Light was provided continuously at an intensity of 1.5-5.0 klux.

C. **Dosage:** Five-day algal growth and reproduction tests (algae) and a fourteen-day duckweed growth and reproduction test (duckweed). The concentrations of Goal Technical in the definitive tests were based on the results of preliminary rangefinding tests. The nominal concentrations were: Selenastrum capricornutum: 0.20, 0.42, 0.80, 1.6, and 3.2 µg/L; Anabaena flos-aquae: 0.19, 0.39, 0.75, 1.5, and 3.0 mg/L; Navicula pelliculosa: 0.10, 0.20, 0.42, 0.80, and 1.6 µg/L; Skeletonema costatum: 0.30, 0.60, 1.3, 2.5, and 5.0 µg/L; and Lemna gibba: 1.3, 2.6, 5.0, 10, and 20 µg/L. Medium and solvent controls were prepared for each test. All concentrations were made based on the percent of active ingredient in the product.

D. **Test Design:**
1. Selenastrum capricornutum. A 3200 µg a.i./mL primary stock solution was prepared by diluting 0.4477 g of Goal Technical to 100 mL with acetone. A 32 µg/mL secondary stock was prepared by diluting 1.0-mL of primary stock to 100 mL with acetone. Appropriate volumes of secondary stock were diluted to 10 mL with acetone to create additional secondary stocks. Equal volumes (0.1 mL) of the secondary stocks were diluted to 1000 mL in sterile MBL medium to give the nominal concentrations. A solvent control was prepared using 0.1 mL/L of acetone in medium which was equivalent to the concentration of solvent present in all test solutions. Three replicate 250-mL flasks (3 per treatment level and the controls) were conditioned by rinsing with the appropriate test solution. One-

hundred mL of the test solution were placed into each flask.

An inoculum of S. capricornutum cells calculated to provide 0.3 x 10^4 cells/mL was aseptically introduced into each flask. The inoculum volume was 900 µL per flask.

2. Anabaena flos-aquae. A 30 mg a.i./mL primary stock was prepared by diluting 2.0982 g of Goal Technical to 50 mL with acetone. Appropriate volumes of primary stock were diluted to 10 mL with acetone to create secondary stocks. Equal volumes (0.05 mL) of the secondary stocks were diluted to 500 mL in sterile AAP Medium. The solvent control contained 0.1 mL/L of acetone in medium. Three replicate 125-mL flasks (3 per treatment level and the controls) were conditioned by rinsing with the appropriate test solution. Fifty mL of the appropriate test solution were placed into each flask.

An inoculum of A. flos-aquae cells calculated to provide 0.3 x 10^4 cells/mL was aseptically introduced into each flask. The inoculum volume was 920 µL per flask.

3. Navicula pelliculosa. Primary and secondary stocks were prepared in the same fashion as in the S. capricornutum test. Equal volumes (0.1 mL) of the secondary stocks were diluted to 1000 mL in sterile AAP medium to give the nominal concentrations. The solvent control contained 0.1 mL/L of acetone in medium. Three replicate 250-mL flasks (3 per treatment level and the controls) were conditioned by rinsing with the appropriate test solution. One-hundred mL of the test solution were placed into each flask.

An inoculum of N. pelliculosa cells calculated to provide 0.3 x 10^4 cells/mL was aseptically introduced into each flask. The inoculum volume was 940 µL per flask.

4. Skeletonema costatum. A 500 µg/mL primary stock was prepared by diluting 0.1399 g of Goal Technical to 200 mL with acetone. Appropriate volumes of primary stock were diluted to 10 mL with acetone to create secondary stocks. Equal volumes (0.05 mL) of the secondary stocks were diluted to 500 mL in sterile Marine Algal Medium to give the nominal test

concentrations. The solvent control contained 0.1 mL/L of acetone in medium. Three replicate 125-mL flasks (3 per treatment level and the controls) were conditioned by rinsing with the appropriate test solution. Fifty mL of the appropriate test solution were placed into each flask.

An inoculum of S. costatum cells calculated to provide 1 x 10^4 cells/mL was aseptically introduced into each flask. The inoculum volume was 640 µL per flask.

5. Lemna gibba. A 200 µg/mL primary stock was prepared by diluting 0.02833 g of Goal Technical to 100 mL with acetone. Appropriate volumes of primary stock were diluted to 10 mL with acetone to create secondary stocks. Equal volumes (0.05 mL) of the appropriate secondary stock were diluted to 500 mL with sterile Hoagland's medium. The solvent control contained 0.1 mL/L of acetone in medium. Three replicate sterile 270-mL crystallizing dishes (3 per treatment level and the controls) were conditioned by rinsing with the appropriate test solution. One-hundred mL of the appropriate test solution were placed into each dish.

An inoculum of L. gibba (5 plants with 3 fronds each) was aseptically introduced into each dish within 25 minutes of solution preparation. Each crystallizing dish was covered with an inverted, sterile petri dish. The dishes were placed in a growth chamber.

Test Monitoring:
1. Algal Tests. At each 24-hour interval, cell counts were conducted on each replicate vessel using a hemacytometer and compound microscope. One sample from each flask was counted. After inoculation and counting, the flasks were impartially positioned on the shaker table in the environmental chamber. For the tests with A. flos-aquae and N. pelliculosa, at test termination the individual culture flasks were sonicated for 2 minutes to facilitate cell counting.

The pH and conductivity were measured at test initiation and termination except in the S. capricornutum and N. pelliculosa tests where conductivity was measured initially only. Temperature was recorded continuously with a minimum/maximum thermometer. The shaking rate of the orbit shaker was recorded daily. The light intensity was measured at the beginning of the test and every 24-hour interval of

the exposure period.

2. Duckweed Test. Fronds were counted and the plants transferred to fresh test solutions every three days. After each renewal, the dishes were impartially repositioned in the growth chamber.

The pH was measured at test initiation, termination and in the new and old solutions at each renewal. Temperature was recorded continuously with a minimum/maximum thermometer. The light intensity was measured at the beginning of the test and every 24-hour interval of the exposure period.

3. All Tests. At test initiation and termination (and at the beginning and end of a 3-day renewal period, on days 9 and 12, for the duckweed test), samples were removed from each test solution and the controls for analysis by gas chromatography.

E. **Statistics:** A t-test (Sokal and Rohlf, 1981) was used to compare control algal cell density or frond count with that of the solvent control. If the two controls were not significantly different, the data were pooled before subsequent analyses.

For each observation period, the EC_{50} value and its 95% confidence limits were determined by linear regression of response (percent reduction of cell density or frond count as compared with controls) vs. exposure concentration (measured or nominal) over the range of test concentrations excluding controls. Various mathematical manipulations (i.e., logarithm and probit transformations) were used on the concentration and response data to get the linear regression with the highest coefficient of determination (r^2).

Cell density data were checked for normality and homogeneity of variance using the Chi-Square Test and Hartley's Test (Neter et al., 1985), respectively. The no-observed-effects concentration (NOEC) was determined using a multiple comparisons procedure.

12. **REPORTED RESULTS:**

1. Selenastrum capricornutum. Measured concentrations at test initiation and termination averaged 133 and 181% of nominal concentrations (Table 1, attached). After 120 hours, the solvent control flask contained a measurable quantity of Goal Technical, 0.299 µg a.i./L. Two of the

three QC samples measured with the termination samples were out of the acceptable recovery range (164 and 189%) which led the author to believe that the test concentrations measured at termination were suspect. The initial measured concentrations, 0.32, 0.39, 0.78, 1.7, and 6.6 µg a.i./L, were used in the statistical analyses.

Cell densities determined at each observation time are presented in Table 2 (attached). Cell densities increased over time in the control, solvent control and 0.32 µg a.i./L test solution. The data from the two sets of controls were pooled before subsequent statistical analysis. The cell density data failed Hartley's Test for homogeneity of variance therefore, the Kruskal-Wallace method was used. This method did not determine the differences between the pooled control and the exposure concentrations as significant even though clear differences were seen by visual inspection. Therefore, a parametric method (Bonferroni's Test) was used to approximate the NOEC.

The 120-hour EC_{50} was 0.35 µg a.i./L with a confidence interval of 0.33-37 µg a.i./L. The NOEC, established at 120 hours, was calculated as 0.32 µg a.i./L.

Test solution conductivity ranged from 270 to 290 µmhos/cm at test initiation. The conductivity could not be measured at termination because of insufficient medium. The pH was between 7.2 and 7.4 in all test solutions and the controls at test initiation and between 7.4 and 9.9 at termination. The temperature ranged from 24 to 26°C during the study.

2. Anabaena flos-aquae. The mean measured concentrations were 0.167, 0.245, 0.444, 1.16, and 2.05 mg a.i./L. Measured concentrations averaged 72% and 70% of nominal at test initiation and termination, respectively (Table 5, attached). Measured quantities of Goal Technical increased or decreased between sampling times with no apparent pattern. Changes in measured concentrations were as much as 38% of nominal.

Cell densities determined at each observation time are presented in Table 6 (attached). Cell counts on the first four days were very irregular because of the filamentous growth form of Anabaena flos-aquae. Sonication on day 5 significantly improved cell counts. Growth enhancement occurred in all exposure concentrations. Cell growth appeared to peak at 0.44 mg a.i./L. The 120-hour EC_{50} was greater than 2.0 mg a.i./L. The NOEC was stated as the highest exposure concentration, 2.0 mg a.i./L.

Conductivity ranged from 90 to 140 µmhos/cm. The pH was between 7.4 and 7.7 in all test solutions and the controls throughout the test. The temperature ranged from 25 to 26°C during the study.

3. Navicula pelliculosa. The mean measured concentrations were 0.100, 0.176, 0.404, 0.619, and 1.45 µg a.i./L. Measured concentrations averaged 95% and 86% of nominal at test initiation and termination, respectively. Measured quantities of Goal Technical were fairly similar between each sampling day. After 120 hours, the control and solvent control solutions contained measurable quantities of Goal Technical, 0.103 and 0.0374 mg a.i./L, respectively.

Cell densities determined at each observation time are presented in Table 9 (attached). Cell densities observed at 24, 48, 72, and 96 hours were very low due to clumping and adherence of cells to the walls of the culture flask. Sonication of the individual flasks greatly increased the number of cells counted at test termination.

The cell density data from the two sets of controls were pooled before determination of the NOEC. The logarithm-transformed data met the assumptions of normality and homogeneity of variance. The 120-hour EC_{50} was 0.24 µg a.i./L with a 95% confidence interval of 0.066-0.82 µg a.i./L. The 120-hour NOEC was determined to be 0.10 µg a.i./L using Bonferroni's Test.

Conductivity ranged from 230 to 240 µmhos/cm at test initiation. There was insufficient medium to determine the conductivity at termination. The pH was between 7.2 and 8.0 throughout the test. The temperature ranged from 24 to 26°C during the study.

4. Skeletonema costatum. Measured concentrations averaged 105% and 78% of nominal at test initiation and termination, respectively (Table 12, attached). The percent recoveries from all six QC samples were out of the acceptable range set by Springborn Laboratories. The author indicated that the measured concentrations were unreliable and that the statistical analyses were performed using nominal concentrations. At initiation and after 120 hours, the solvent control flask contained measurable quantities of Goal Technical, 0.362 and 0.179 µg a.i./L, respectively.

Cell densities determined at each observation time are presented in Table 13 (attached). There was no significant difference between control and solvent control cell density

so the data from the two groups were pooled before subsequent statistical analysis.

The 120-hour EC_{50} was calculated to be 3.3 µg a.i./L with a 95% confidence interval of 1.1-5.8 µg a.i./L. The NOEC, established at 120 hours, was 2.5 µg a.i./L as determined by Bonferroni's Test.

Conductivity ranged from 26,000 to 28,000 µmhos/cm at test initiation and from 27,000 to 28,000 µmhos/cm at termination. The pH was 8.1 in all test solutions and the controls at test initiation and between 8.3 and 9.0 at termination. The temperature ranged from 20 to 22°C during the study.

5. Lemna gibba. Test solution concentrations measured on days 9 and 12 are given in Table 16 (attached). Measured concentrations averaged 44 and 55% of nominal. Day 12 measurements were very inconsistent and the percent recovery of one of the QC samples was out of the acceptable range. Because of the inconsistencies in the day 12 measurements, the day 9 measured concentrations, 0.72, 1.2, 2.2, 4.3, and 6.2 µg a.i./L, were used in the statistical analyses.

Frond counts for the controls and the exposure concentrations are given in Table 17 (attached). Frond production in the solvent and medium controls were not significantly different, so the data from the two groups were pooled before subsequent analyses.

The 14-day EC_{50} was calculated to be 1.4 µg a.i./L with a 95% confidence interval of 0.87-2.4 µg a.i./L. Frond production in the exposure concentrations were significantly different from the pooled controls (using Bonferroni's Test). Therefore, the NOEC was less than 0.55 µg a.i./L (the lowest concentration tested was 0.72 µg a.i./L, therefore the author's NOEC is probably in error).

The pH ranged from 5.0 to 6.0 during the exposure period. The light intensity was 1.5 to 5.0 klux. The temperature ranged from 20 to 29°C during the study.

13. **STUDY AUTHOR'S CONCLUSIONS/QUALITY ASSURANCE MEASURES:** No conclusions were made by the study author.

Good Laboratory Practice and Quality Assurance Unit statements were included in the report indicating compliance to with EPA Good Laboratory Practice Standards under the Federal Insecticide, Fungicide, and Rodenticide Act.

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

A. Test Procedure: The test procedure and the report were generally in accordance with the SEP and Subdivision J guidelines, except for the following deviations:

1. Algal Tests.
Two-day old N. pelliculosa cultures, three-day old A. flos-aquae cultures, four-day old S. capricornutum cultures, and five-day old S. costatum cultures were used to initiate the test. Six to eight-day old cultures are recommended.

The light intensity during the S. capricornutum and S. costatum were 3.5-5.0 and 4.0-5.0 klux, respectively. The recommended light intensity for these two species is 4.0 klux. Light intensity during the N. pelliculosa and A. flos-aquae tests were 3.5-5.0 and 1.2-2.2 klux, respectively. The recommended light intensity for these two species are 4.3 and 2.0 klux, respectively.

The conductivity of the test solutions were not measured at test termination in the S. capricornutum and N. pelliculosa tests.

The dissolved oxygen, hardness, and alkalinity of the test solutions were not measured.

2. Duckweed Test.
The light intensity during the test (1.5-5.0 klux) was lower than recommended (5.0 klux).

The recommended temperature for tests involving L. gibba is 25°C. Due to environmental chamber malfunctions, the temperature during this test was 20°-29°C.

The conductivity of the test solutions was not measured.

The hardness and alkalinity of the test solutions were not measured.

B. Statistical Analysis: The reviewer used a computer program (Toxstat Version 3.3) and similar methods to those cited in the report and obtained the same or similar NOEC values (see attached printouts). The reviewer used EPA's Toxanal computer program to determine the 120-hour EC_{50} or 14-day EC_{50} values and

obtained the same or similar results (see attached printouts).

C. **Discussion/Results:** The analytical results from all but one study (Navicula pelliculosa) indicated that the concentration of Goal Technical was highly variable. In the Selenastrum capricornutum, Skeletonema costatum, and Lemna gibba tests, several or all of the QC samples which accompany the analytical samples gave recoveries of Goal Technical which were out of the acceptable range allowed by Springborn Laboratories. In these three studies, the concentrations measured at initiation (or on day 9 in the L. gibba test) were not consistent with the concentrations measured at the end of the test. The values increased or decreased by as much as 89% of nominal between sampling times.

The author chose the concentrations which he considered the most reliable for subsequent reporting and statistical analysis. For the S. capricornutum test, the initial measured concentrations were chosen because of poor recovery from the QC samples at termination. All six of the QC samples failed (3 at initiation, 3 at termination), so nominal concentrations were chosen as the actual concentrations for the S. costatum test. The measurements taken on day 9 of the L. gibba test were used as actual concentrations because one of the QC samples measured with the termination samples was out of range. While the practice of choosing test concentrations from nominal, initial measured or final measured may help approximate the actual concentrations the plants were exposed to, it also indicates a flaw in the analytical procedure or test design which casts doubt that the actual exposure concentrations are known.

In the Anabaena flos-aquae test, the QC samples indicated that a consistent recovery of 86 to 100% of Goal Technical was possible. However, changes from initial measured concentrations as much as 38% of nominal were encountered at test termination. The author suggested using mean measured concentrations as approximations of the actual concentrations but, as above, the extent of the variation between sampling days casts doubt on their use.

Of the five studies making up this report, the analytical results from the N. pelliculosa test are the most consistent. Recoveries from the QC samples averaged 101 to 103% of nominal at test termination and

initiation, respectively. In all but the lowest concentration, 0.100 µg a.i./L (mean measured), measured concentrations slightly decreased over time and the change was no greater than 23% of nominal. In this case, the mean measured concentrations presented are probably good approximations of the actual concentrations the algae were exposed to.

However, in three studies (N. pelliculosa, S. capricornutum, and S. costatum) measurable amounts of the test material were reported in the negative control and/or the solvent control at test termination or at initiation and termination. The presence of toxicant in the controls may have altered the response of the algae leading to decreased growth and the comparisons of the exposure concentrations to these "controls" are not valid.

The tests in this report (except the N. pelliculosa test) suffer from inconsistent analytical results. It is possible that the test material is highly volatile or degrades quickly but a pattern of loss of the test material from solution was not apparent from the analytical results. It is likely that the instrumentation used for measuring Goal Technical was malfunctioning or that gas chromatography is unsuitable for reliably measuring this chemical.

The 120-hour EC_{50} values of Goal Technical for S. capricornutum, A. flos-aquae, N. pelliculosa, and S. costatum were 0.35 µg a.i./L, >2000 µg a.i./L, 0.20 µg a.i./L, and 3.15 µg a.i./L, respectively. The 14-day EC_{50} value for L. gibba was 1.47 µg a.i./L. The maximum application rate for Goal Technical is 2 lb a.i./acre or 1.47 mg a.i./L if maximally applied to a 15-cm water column. Under the conditions of the tests, Goal Technical would be expected to have detrimental effects on all but one (A. flos-aquae) of the five species studied when maximally applied at the present label rate.

D. **Adequacy of the Study:**

(1) **Classification:** Invalid: All Tests.

(2) **Rationale:** Inconsistent analytical results indicate that the actual concentrations the aquatic plants were exposed to are unknown. Also, control and/or solvent control solutions appeared

to be contaminated in the tests using S. capricornutum, N. pelliculosa, and S. costatum.

(3) **Repairability:** No.

15. **COMPLETION OF ONE-LINER:** Yes, 04/02/91.

RIN 0637-00

EFED Review - Oxyfluorfen

Page____ is not included in this copy.

Pages 15 through 29 are not included.

The material not included contains the following type of information:

____ Identity of product inert ingredients.

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t-test of Solvent and Blank Controls Ho:GRP1 MEAN = GRP2 MEAN

GRP1 (SOLVENT CRTL) MEAN	= 963333.3333	CALCULATED t VALUE =	2.0120
GRP2 (BLANK CRTL) MEAN	= 853333.3333	DEGREES OF FREEDOM =	4
DIFFERENCE IN MEANS	= 110000.0000		

TABLE t VALUE (0.05 (2), 4) = 2.776 NO significant difference at alpha=0.05
TABLE t VALUE (0.01 (2), 4) = 4.604 NO significant difference at alpha=0.01

Chi-square test for normality: actual and expected frequencies

INTERVAL	<-1.5	-1.5 to <-0.5	-0.5 to 0.5	>0.5 to 1.5	>1.5
EXPECTED	1.340	4.840	7.640	4.840	1.340
OBSERVED	0	7	9	4	0

Calculated Chi-Square goodness of fit test statistic = 4.0318
Table Chi-Square value (alpha = 0.01) = 13.277

Data PASS normality test. Continue analysis.

Hartley test for homogeneity of variance
Bartletts test for homogeneity of variance

These two tests can not be performed because at least one group has zero variance.

Data FAIL to meet homogeneity of variance assumption.
Additional transformations are useless.

ANOVA TABLE

SOURCE	DF	SS	MS	F
Between	5	3770996666672.000	754199333334.000	177.508
Within (Error)	14	59483333328.000	4248809523.430	
Total	19	3830480000000.000		

Critical F value = 2.96 (0.05,5,14)
Since F > Critical F REJECT Ho:All groups equal

BONFERRONI T-TEST - TABLE 1 OF 2 Ho:Control<Treatment

GROUP	IDENTIFICATION	TRANSFORMED MEAN	MEAN CALCULATED IN ORIGINAL UNITS	T STAT	SIG
1	GRPS 1&2 POOLED	908333.333	908333.333		
2	0.32 µg a.i./L	833333.333	833333.333	1.627	
3	0.39	13333.333	13333.333	19.418	*
4	0.78	10000.000	10000.000	19.490	*
5	1.7	13333.333	13333.333	19.418	*
6	6.6	10000.000	10000.000	16.879	*

LR 3/26/91

Bonferroni T table value = 2.63 (1 Tailed Value, P=0.05, df=14,5)

BONFERRONI T-TEST - TABLE 2 OF 2 Ho:Control<Treatment

GROUP	IDENTIFICATION	NUM OF REPS	Minimum Sig Diff (IN ORIG. UNITS)	% of CONTROL	DIFFERENCE FROM CONTROL
1	GRPS 1&2 POOLED	6			
2	0.32 µg a.i./L	3	120989.572	13.3	75000.000
3	0.39	3	120989.572	13.3	895000.000
4	0.78	3	120989.572	13.3	898333.333
5	1.7	3	120989.572	13.3	895000.000
6	6.6	2	139706.724	15.4	898333.333

LR 3/26/91

KRUSKAL-WALLIS ANOVA BY RANKS - TABLE 1 OF 2 (p=0.05)

GROUP	IDENTIFICATION	TRANSFORMED MEAN	MEAN CALCULATED IN ORIGINAL UNITS	RANK SUM
1	GRPS 1&2 POOLED	908333.333	908333.333	101.000
2	0.32 µg a.i./L	833333.333	833333.333	43.000
3	µ 0.39	13333.333	13333.333	20.500
4	LR 3/26/91 0.78	10000.000	10000.000	15.000
5	1.7	13333.333	13333.333	20.500
6	6.6	10000.000	10000.000	10.000

Calculated H Value = 16.253 Critical H Value Table = 11.070
Since Calc H > Crit H REJECT Ho:All groups are equal.

DUNNS MULTIPLE COMPARISON - KRUSKAL-WALLIS - TABLE 2 OF 2 (p=0.05)

GROUP	IDENTIFICATION	TRANSFORMED MEAN	ORIGINAL MEAN	GROUP 0 4	0 6	0 5	0 3	0 2	0 1
4	0.78	10000.000	10000.000	\					
6	6.6	10000.000	10000.000	.	\				
5	1.7	13333.333	13333.333	.	.	\			
3	0.39	13333.333	13333.333	.	.	.	\		
2	0.32 µg a.i./L	833333.333	833333.333	.	.	.	.	\	
1	GRPS 1&2 POOLED	908333.333	908333.333	*	.	.	.	.	\

* = significant difference (p=0.05) . = no significant difference
Table q value (0.05,6) = 2.936 Unequal reps - several SE values used

t-test of Solvent and Blank Controls Ho:GRP1 MEAN = GRP2 MEAN

GRP1 (SOLVENT CRTL) MEAN =	18.0000	CALCULATED t VALUE =	-0.0574
GRP2 (BLANK CRTL) MEAN =	18.3333	DEGREES OF FREEDOM =	4
DIFFERENCE IN MEANS =	-0.3333		

TABLE t VALUE (0.05 (2), 4) = 2.776 NO significant difference at alpha=0.05
TABLE t VALUE (0.01 (2), 4) = 4.604 NO significant difference at alpha=0.01

Shapiro Wilks test for normality

D = 3236.833
W = 0.940
Critical W (P = 0.05) (n = 21) = 0.908
Critical W (P = 0.01) (n = 21) = 0.873

Data PASS normality test at P=0.01 level. Continue analysis.

Bartletts test for homogeneity of variance

Calculated B statistic = 10.53
Table Chi-square value = 15.09 (alpha = 0.01)
Table Chi-square value = 11.07 (alpha = 0.05)
Average df used in calculation ==> df (avg n - 1) = 2.50
Used for Chi-square table value ==> df (#groups-1) = 5

Data PASS homogeneity test at 0.01 level. Continue analysis.

NOTE: If groups have unequal replicate sizes the average replicate size is used to calculate the B statistic (see above).

ANOVA TABLE

SOURCE	DF	SS	MS	F
Between	5	6670.976	1334.195	6.183
Within (Error)	15	3236.833	215.789	
Total	20	9907.810		

Critical F value = 2.90 (0.05,5,15)
Since F > Critical F REJECT Ho:All groups equal

BONFERRONI T-TEST - TABLE 1 OF 2 **Ho:Control>Treatment**

GROUP	IDENTIFICATION	TRANSFORMED MEAN	MEAN CALCULATED IN ORIGINAL UNITS	T STAT	SIG
1	GRPS 1&2 POOLED	18.167	18.167		
2	0.17 mg a.i./L	28.333	28.333	0.979	
3	0.25	33.333	33.333	1.460	
4	LR 3/26/91 0.44	69.000	69.000	4.894	*
5	1.2	55.667	55.667	3.610	*
6	2.0	45.000	45.000	2.583	

Bonferroni T table value = 2.60 (1 Tailed Value, P=0.05, df=15,5)

BONFERRONI T-TEST - TABLE 2 OF 2 Ho:Control>Treatment

GROUP	IDENTIFICATION	NUM OF REPS	Minimum Sig Diff (IN ORIG. UNITS)	% of CONTROL	DIFFERENCE FROM CONTROL
1	GRPS 1&2 POOLED	6			
2	0.17 mg a.i./L	3	27.038	148.8	-10.167
3	0.25	3	27.038	148.8	-15.167
4	LR 3/26/91 0.44	3	27.038	148.8	-50.833
5	1.2	3	27.038	148.8	-37.500
6	2.0	3	27.038	148.8	-26.833

t-test of Solvent and Blank Controls Ho:GRP1 MEAN = GRP2 MEAN

GRP1 (SOLVENT CRTL) MEAN =	67.3333	CALCULATED t VALUE =	0.7518
GRP2 (BLANK CRTL) MEAN =	58.6667	DEGREES OF FREEDOM =	4
DIFFERENCE IN MEANS =	8.6667		

TABLE t VALUE (0.05 (2), 4) = 2.776 NO significant difference at alpha=0.05
TABLE t VALUE (0.01 (2), 4) = 4.604 NO significant difference at alpha=0.01

Shapiro Wilks test for normality

D = 0.277
W = 0.929
Critical W (P = 0.05) (n = 21) = 0.908
Critical W (P = 0.01) (n = 21) = 0.873

Data PASS normality test at P=0.01 level. Continue analysis.

Bartletts test for homogeneity of variance

Calculated B statistic = 12.42
Table Chi-square value = 15.09 (alpha = 0.01)
Table Chi-square value = 11.07 (alpha = 0.05)
Average df used in calculation ==> df (avg n - 1) = 2.50
Used for Chi-square table value ==> df (#groups-1) = 5

Data PASS homogeneity test at 0.01 level. Continue analysis.

NOTE: If groups have unequal replicate sizes the average replicate size is used to calculate the B statistic (see above).

ANOVA TABLE

SOURCE	DF	SS	MS	F
Between	5	7.745	1.549	83.744
Within (Error)	15	0.277	0.018	
Total	20	8.023		

Critical F value = 2.90 (0.05,5,15)
Since F > Critical F REJECT Ho:All groups equal

BONFERRONI T-TEST - TABLE 1 OF 2 Ho:Control<Treatment

GROUP	IDENTIFICATION	TRANSFORMED MEAN	MEAN CALCULATED IN ORIGINAL UNITS	T STAT	SIG
1	GRPS 1&2 POOLED	1.791	63.000		
2	0.10 µg a.i./L	1.794	62.333	-0.034	
3	0.18	1.304	20.333	5.066	*
4	0.40	0.981	9.667	8.419	*
5	0.62	0.577	4.000	12.620	*
6	1.4	0.159	1.667	16.971	*

LR 3/26/91

Bonferroni T table value = 2.60 (1 Tailed Value, P=0.05, df=15,5)

BONFERRONI T-TEST - TABLE 2 OF 2 Ho:Control<Treatment

GROUP	IDENTIFICATION	NUM OF REPS	Minimum Sig Diff (IN ORIG. UNITS)	% of CONTROL	DIFFERENCE FROM CONTROL
1	GRPS 1&2 POOLED	6			
2	0.10 µg a.i./L	3	27.081	43.0	0.667
3	0.18	3	27.081	43.0	42.667
4	0.40	3	27.081	43.0	53.333
5	0.62	3	27.081	43.0	59.000
6	1.4	3	27.081	43.0	61.333

CLS 3/26/91

t-test of Solvent and Blank Controls Ho:GRP1 MEAN = GRP2 MEAN

GRP1 (SOLVENT CRTL) MEAN =	203.6667	CALCULATED t VALUE =	-0.2707
GRP2 (BLANK CRTL) MEAN =	210.3333	DEGREES OF FREEDOM =	4
DIFFERENCE IN MEANS =	-6.6667		

TABLE t VALUE (0.05 (2), 4) = 2.776 NO significant difference at alpha=0.05
TABLE t VALUE (0.01 (2), 4) = 4.604 NO significant difference at alpha=0.01

Shapiro Wilks test for normality

D = 16048.000
W = 0.943
Critical W (P = 0.05) (n = 21) = 0.908
Critical W (P = 0.01) (n = 21) = 0.873

Data PASS normality test at P=0.01 level. Continue analysis.

Bartletts test for homogeneity of variance

Calculated B statistic = 10.08
Table Chi-square value = 15.09 (alpha = 0.01)
Table Chi-square value = 11.07 (alpha = 0.05)
Average df used in calculation ==> df (avg n - 1) = 2.50
Used for Chi-square table value ==> df (#groups-1) = 5

Data PASS homogeneity test at 0.01 level. Continue analysis.

NOTE: If groups have unequal replicate sizes the average replicate size is used to calculate the B statistic (see above).

ANOVA TABLE

SOURCE	DF	SS	MS	F
Between	5	72223.238	14444.648	13.501
Within (Error)	15	16048.000	1069.867	
Total	20	88271.238		

Critical F value = 2.90 (0.05,5,15)
Since F > Critical F REJECT Ho:All groups equal

BONFERRONI T-TEST - TABLE 1 OF 2 Ho:Control<Treatment

GROUP	IDENTIFICATION	TRANSFORMED MEAN	MEAN CALCULATED IN ORIGINAL UNITS	T STAT	SIG
1	GRPS 1&2 POOLED	207.000	207.000		
2	0.30	189.333	189.333	0.764	
3	0.60	206.667	206.667	0.014	
4	1.3	178.000	178.000	1.254	
5	2.5	153.333	153.333	2.320	
6	5.0	31.000	31.000	7.610	*

Bonferroni T table value = 2.60 (1 Tailed Value, P=0.05, df=15,5)

BONFERRONI T-TEST - TABLE 2 OF 2 Ho:Control<Treatment

GROUP	IDENTIFICATION	NUM OF REPS	Minimum Sig Diff (IN ORIG. UNITS)	% of CONTROL	DIFFERENCE FROM CONTROL
1	GRPS 1&2 POOLED	6			
2	0.30	3	60.204	29.1	17.667
3	0.60	3	60.204	29.1	0.333
4	1.3	3	60.204	29.1	29.000
5	2.5	3	60.204	29.1	53.667
6	5.0	3	60.204	29.1	176.000

t-test of Solvent and Blank Controls Ho:GRP1 MEAN = GRP2 MEAN

GRP1 (SOLVENT CRTL) MEAN =	417.6667	CALCULATED t VALUE =	-1.5064
GRP2 (BLANK CRTL) MEAN =	456.3333	DEGREES OF FREEDOM =	4
DIFFERENCE IN MEANS =	-38.6667		

TABLE t VALUE (0.05 (2), 4) = 2.776 NO significant difference at alpha=0.05
TABLE t VALUE (0.01 (2), 4) = 4.604 NO significant difference at alpha=0.01

Shapiro Wilks test for normality

D = 20148.000
W = 0.959
Critical W (P = 0.05) (n = 21) = 0.908
Critical W (P = 0.01) (n = 21) = 0.873

Data PASS normality test at P=0.01 level. Continue analysis.

Bartletts test for homogeneity of variance

Calculated B statistic = 12.77
Table Chi-square value = 15.09 (alpha = 0.01)
Table Chi-square value = 11.07 (alpha = 0.05)
Average df used in calculation ==> df (avg n - 1) = 2.50
Used for Chi-square table value ==> df (#groups-1) = 5

Data PASS homogeneity test at 0.01 level. Continue analysis.

NOTE: If groups have unequal replicate sizes the average replicate size is used to calculate the B statistic (see above).

ANOVA TABLE

SOURCE	DF	SS	MS	F
Between	5	525194.571	105038.914	78.201
Within (Error)	15	20148.000	1343.200	
Total	20	545342.571		

Critical F value = 2.90 (0.05,5,15)
Since F > Critical F REJECT Ho:All groups equal

BONFERRONI T-TEST - TABLE 1 OF 2 Ho:Control<Treatment

GROUP	IDENTIFICATION	TRANSFORMED MEAN	MEAN CALCULATED IN ORIGINAL UNITS	T STAT	SIG
1	GRPS 1&2 POOLED	437.000	437.000		
2	0.72	342.333	342.333	3.653	*
3	1.2	260.000	260.000	6.830	*
4	2.2	148.333	148.333	11.139	*
5	4.3	39.333	39.333	15.345	*
6	6.2	45.000	45.000	15.126	*

Bonferroni T table value = 2.60 (1 Tailed Value, P=0.05, df=15,5)

BONFERRONI T-TEST - TABLE 2 OF 2 Ho:Control<Treatment

GROUP	IDENTIFICATION	NUM OF REPS	Minimum Sig Diff (IN ORIG. UNITS)	% of CONTROL	DIFFERENCE FROM CONTROL
1	GRPS 1&2 POOLED	6			
2	0.72	3	67.457	15.4	94.667
3	1.2	3	67.457	15.4	177.000
4	2.2	3	67.457	15.4	288.667
5	4.3	3	67.457	15.4	397.667
6	6.2	3	67.457	15.4	392.000

LOUIS M. RIFICI OXYFLUORFEN SELENASTRUM CAPRICORNUTUM 3-26-91

CONC.	NUMBER EXPOSED	NUMBER DEAD	PERCENT DEAD	BINOMIAL PROB.(PERCENT)
6.6	100	99	99	0
1.7	100	99	99	0
.78	100	99	99	0
.39	100	99	99	0
.32	100	8	8	0

BECAUSE THE NUMBER OF ORGANISMS USED WAS SO LARGE, THE 95 PERCENT CONFIDENCE INTERVALS CALCULATED FROM THE BINOMIAL PROBABILITY ARE UNRELIABLE. USE THE INTERVALS CALCULATED BY THE OTHER TESTS.

AN APPROXIMATE LC50 FOR THIS SET OF DATA IS .348057

RESULTS CALCULATED USING THE MOVING AVERAGE METHOD

SPAN	G	LC50	95 PERCENT CONFIDENCE LIMITS	
1	.0142983	.348057	.3438142	.3522

RESULTS CALCULATED USING THE PROBIT METHOD

ITERATIONS	G	H	GOODNESS OF FIT PROBABILITY
8	19397.74	111863.2	0

A PROBABILITY OF 0 MEANS THAT IT IS LESS THAN 0.001.

SINCE THE PROBABILITY IS LESS THAN 0.05, RESULTS CALCULATED USING THE PROBIT METHOD PROBABLY SHOULD NOT BE USED.

SLOPE = 4.173925
95 PERCENT CONFIDENCE LIMITS =-577.1527 AND 585.5006

LC50 = .3318437
95 PERCENT CONFIDENCE LIMITS = 0 AND +INFINITY

LC10 = .1646887
95 PERCENT CONFIDENCE LIMITS = 0 AND +INFINITY

LOUIS M. RIFICI OXYFLUORFEN NAVICULA PELLICULOSA 3-26-91

****

CONC.	NUMBER EXPOSED	NUMBER DEAD	PERCENT DEAD	BINOMIAL PROB.(PERCENT)
1.4	100	97	97	0
.62	100	94	94	0
.4	100	85	85	0
.18	100	68	68	0
.1	100	1	1	0

THE BINOMIAL TEST SHOWS THAT .1 AND .18 CAN BE
USED AS STATISTICALLY SOUND CONSERVATIVE 95 PERCENT
CONFIDENCE LIMITS, BECAUSE THE ACTUAL CONFIDENCE LEVEL
ASSOCIATED WITH THESE LIMITS IS GREATER THAN 95 PERCENT.

AN APPROXIMATE LC50 FOR THIS SET OF DATA IS .1586218

RESULTS CALCULATED USING THE MOVING AVERAGE METHOD

SPAN	G	LC50	95 PERCENT CONFIDENCE LIMITS	
3	1.557193E-02	.2043987	.1851476	.2236121

RESULTS CALCULATED USING THE PROBIT METHOD

ITERATIONS	G	H	GOODNESS OF FIT PROBABILITY
5	1.362315	21.36737	0

A PROBABILITY OF 0 MEANS THAT IT IS LESS THAN 0.001.

SINCE THE PROBABILITY IS LESS THAN 0.05, RESULTS CALCULATED
USING THE PROBIT METHOD PROBABLY SHOULD NOT BE USED.

SLOPE = 3.2226
95 PERCENT CONFIDENCE LIMITS =-.5387619 AND 6.983961

LC50 = .1966735
95 PERCENT CONFIDENCE LIMITS = 0 AND +INFINITY

LC10 = 7.936961E-02
95 PERCENT CONFIDENCE LIMITS = 0 AND .1820405

****

LOUIS M. RIFICI OXYFLUORFEN SKELETONEMA COSTATUM 3-26-91

****

CONC.	NUMBER EXPOSED	NUMBER DEAD	PERCENT DEAD	BINOMIAL PROB.(PERCENT)
5	100	85	85	0
2.5	100	26	26	0
1.3	100	14	14	0
.6	100	0	0	0
.3	100	9	9	0

THE BINOMIAL TEST SHOWS THAT 2.5 AND 5 CAN BE USED AS STATISTICALLY SOUND CONSERVATIVE 95 PERCENT CONFIDENCE LIMITS, BECAUSE THE ACTUAL CONFIDENCE LEVEL ASSOCIATED WITH THESE LIMITS IS GREATER THAN 95 PERCENT.

AN APPROXIMATE LC50 FOR THIS SET OF DATA IS 3.282196

RESULTS CALCULATED USING THE MOVING AVERAGE METHOD

SPAN	G	LC50	95 PERCENT CONFIDENCE LIMITS	
2	3.143389E-02	3.145639	2.830988	3.545514

RESULTS CALCULATED USING THE PROBIT METHOD

ITERATIONS	G	H	GOODNESS OF FIT PROBABILITY
5	2.375487	27.74314	0

A PROBABILITY OF 0 MEANS THAT IT IS LESS THAN 0.001.

SINCE THE PROBABILITY IS LESS THAN 0.05, RESULTS CALCULATED USING THE PROBIT METHOD PROBABLY SHOULD NOT BE USED.

SLOPE = 2.230274

95 PERCENT CONFIDENCE LIMITS =-1.207162 AND 5.667711

LC50 = 3.08197

95 PERCENT CONFIDENCE LIMITS = 0 AND +INFINITY

LC10 = .8305995

95 PERCENT CONFIDENCE LIMITS = 0 AND +INFINITY

****

LOUIS M. RIFICI OXYFLUORFEN LEMNA GIBBA 3-26-91

CONC.	NUMBER EXPOSED	NUMBER DEAD	PERCENT DEAD	BINOMIAL PROB.(PERCENT)
6.2	100	90	90	0
4.3	100	91	91	0
2.2	100	66	66	0
1.2	100	41	41	0
.72	100	22	22	0

THE BINOMIAL TEST SHOWS THAT 1.2 AND 2.2 CAN BE USED AS STATISTICALLY SOUND CONSERVATIVE 95 PERCENT CONFIDENCE LIMITS, BECAUSE THE ACTUAL CONFIDENCE LEVEL ASSOCIATED WITH THESE LIMITS IS GREATER THAN 95 PERCENT.

AN APPROXIMATE LC50 FOR THIS SET OF DATA IS 1.490114

RESULTS CALCULATED USING THE MOVING AVERAGE METHOD

SPAN	G	LC50	95 PERCENT CONFIDENCE LIMITS	
3	3.243228E-02	1.471925	1.294622	1.659504

RESULTS CALCULATED USING THE PROBIT METHOD

ITERATIONS	G	H	GOODNESS OF FIT PROBABILITY
3	.0276796	1	.3501305

SLOPE = 2.398992
95 PERCENT CONFIDENCE LIMITS = 1.999867 AND 2.798116

LC50 = 1.481898
95 PERCENT CONFIDENCE LIMITS = 1.294426 AND 1.674728

LC10 = .4379546
95 PERCENT CONFIDENCE LIMITS = .3188522 AND .5540043

Vaughnessey No. 111601 Chemical Name Oxyfluorfen Chemical Class ____ Page 1 of 2

Study/Species/Lab/ Accession	Chemical % a.i.	Results	Reviewer/ Date	Validation Status
4-Day Single Dose Oral LD_{50}		LD50 = mg/kg (95% C.L.) Contr. Mort.(%)=		
pecies	____	Slope= # Animals/Level= Age(Days)= Sex =	____	____
ab		14-Day Dose Level mg/kg/(% Mortality) ( ), ( ), ( ), ( ), ( )		
cc.		Comments:		
4-Day Single Dose Oral LD_{50}		LD50 = mg/kg. (95% C.L.) Contr. Mort.(%)=		
pecies	____	Slope= # Animals/Level= Age(Days)= Sex =	____	____
ab		14-Day Dose Level mg/kg/(% Mortality) ( ), ( ), ( ), ( ), ( )		
cc.		Comments:		
-Day Dietary LC_{50}		LC50 = ppm (95% C.L.) Contr. Mort.(%)=		
pecies		Slope= # Animals/Level= Age(Days)= Sex =		
ab	____	8-Day Dose Level ppm/(%Mortality) ( ), ( ), ( ), ( ), ( )	____	____
cc.		Comments:		
-Day Dietary LC_{50}		LC50 = ppm (95% C.L.) Contr. Mort.(%)=		
pecies		Slope= # Animals/Level= Age(Days)= Sex =		
ab	____	8-Day Dose Level ppm/(%Mortality) ( ), ( ), ( ), ( ), ( )	____	____
cc.		Comments:		
~~8~~-Hour LC_{50} 120-hour		LC50 = 0.35 *ppb (95% C.L. MOVING Average 0.344 - 0.352) Inhibition Contr. Mort.(%)= 0		
pecies Selenastrum capricornutum	71.5	Slope= N/A # Cells/ml/Level= 0.3x10⁴ Sol. Contr. Mort.(%)= 0		
ab Springborn Laboratories		120 ~~8~~-Hour Dose Level *ppb/(%Inhibition) Temperature = 24-26°C	LR 4/2/91	INVALID
MRID 416184-00		0.32 (8), 0.39 (99), 0.78 (99), 1.7 (99), 6.6 (99)		
		Comments: * Initial Measured Concentrations		
~~8~~-Hour LC_{50} 120		LC50 = >2.05 *ppm (95% C.L. N/A) Inhibition Con. Mort.(%)= 0		
Species Anabaena flos-aquae		Slope= N/A # Cells/ml/Level= 0.3x10⁴ Sol. Con. Mort.(%)= 0	LR 4/2/91	INVALID
ab	____	120 ~~8~~-Hour Dose Level *ppm/(%Stimulation) Temp. = 25-26°C		
cc.		0.17 (56), 0.25 (84), 0.44 (280), 1.2 (206), 2.0 (148)		
		Comments: * Mean Measured Concentrations, Response = % Stimulation		
~~8~~-Hour LC_{50} 120		LC50 = 0.20 *ppb (95% C.L. MOVING Average 0.186 - 0.224) Inhibition Con. Mort.(%)= 0		
Species Navicula pelliculosa		Slope= N/A # Cells/ml/Level= 0.3x10⁴ Sol. Con. Mort.(%)= 0	LR 4/2/91	INVALID
ab	____	120 ~~8~~-Hour Dose Level *ppb/(%Inhibition) Temp. = 24-26°C		
cc.		0.1 (1), 0.18 (68), 0.4 (85), 0.62 (94), 1.4 (97)		
		Comments: * Mean Measured Concentrations		

Vaughnessey No. 11601 Chemical Name Oxyfluorfen Chemical Class ____ Page 2 of 2

Study/Species/Lab/ Accession	Chemical % a.i.	Results	Reviewer/ Date	Validation Status
4-Day Single Dose Oral LD_{50}		LD50 = mg/kg (95% C.L.) Contr. Mort.(%)=		
pecies	____	Slope= # Animals/Level= Age(Days)= Sex =	____	____
ab		14-Day Dose Level mg/kg/(% Mortality) ( ), ( ), ( ), ( ), ( )		
cc.		Comments:		
4-Day Single Dose Oral LD_{50}		LD50 = mg/kg. (95% C.L) Contr. Mort.(%)=		
pecies	____	Slope= # Animals/Level= Age(Days)= Sex =	____	____
ab		14-Day Dose Level mg/kg/(% Mortality) ( ), ( ), ( ), ( ), ( )		
cc.		Comments:		
-Day Dietary LC_{50}		LC50 = ppm (95% C.L.) Contr. Mort.(%)=		
pecies		Slope= # Animals/Level= Age(Days)= Sex =		
ab	____	8-Day Dose Level ppm/(%Mortality) ( ), ( ), ( ), ( ), ( )	____	____
cc.		Comments:		
-Day Dietary LC_{50}		LC50 = ppm (95% C.L) Contr. Mort.(%)=		
pecies		Slope= # Animals/Level= Age(Days)= Sex =		
ab	____	8-Day Dose Level ppm/(%Mortality) ( ), ( ), ( ), ( ), ( )	____	____
cc.		Comments:		
~~8-Hour LC_{50}~~ 120-hour		LC50 = 3.15 * ppb (95% C.L. Moving Average 2.83 - 3.55) Inhibition Contr. Mort.(%)= 0		
pecies Skeletonema costatum	71.6	Slope= N/A # ~~Animals~~/Level= cells/ML Sol. Contr. Mort.(%)= 0		
ab Springborn Laboratories		120 ~~8~~-Hour Dose Level *ppb/(%~~Mortality~~ Inhibition) Temperature = 20-22°C 0.3 (9), 0.6 (0), 1.3 (14), 2.5 (26), 5.0 (86)	LL 4/2/91	INVALID
see MRID 416184-00		Comments: * nominal concentrations		
~~96-Hour~~ LC_{50} 14-day		LC50 = 1.48 * ppb (95% C.L. Probit 1.29 - 1.67) Inhibition Con. ~~Mort.~~(%)= 0		
pecies Lemna gibba		Slope= 2.399 # ~~Animals~~/Level= Plants/Flask = 5 Sol. Con. ~~Mort.~~(%)= 0	LL 4/2/91	INVALID
ab	____	14-day ~~8~~-Hour Dose Level *ppb/(%Mortality) Temp.= 20-29°C 0.72 (22), 1.2 (41), 2.2 (66), 4.3 (91), 6.2 (90)		
cc.		Comments: * day 9 measured concentrations		
96-Hour LC_{50}		LC50 = pp__ (95% C.L) Con. Mort.(%)= Sol. Con. Mort.(%)=		
pecies		Slope= # Animals/Level= Temp.=		
ab	____	96-Hour Dose Level pp /(%Mortality) ( ), ( ), ( ), ( ), ( )	____	____
cc.		Comments:		