File

~~10-07-92~~
10-5-92

DP Barcode : D176132, D176001
PC Code No : 088004
EEB Out : OCT 5 1992
EEB In : 03-26-92

To: L. Schnaubelt
Product Manager (72)
Special Review and Reregistration Division (H7508W)

From: Douglas J. Urban, Acting Chief
Ecological Effects Branch/EFED (H7507C)

Attached, please find the EEB review of...

Reg./File # :
Chemical Name : Sodium Omadine
Type Product : Microbiocide; fungicide
Product Name : Sodium Omadine
Company Name : Olin Corporation
Purpose : Data review: rainbow trout acute, bluegill acute, bobwhite acute

Action Code : 627 Date Due : 07-04-92
Reviewer : H. Mansfield

EEB Guideline/MRID Summary Table: The review in this package contains an evaluation of the following:

GDLN NO	MRID NO	CAT	GDLN NO	MRID NO	CAT	GDLN NO	MRID NO	CAT
71-1(A) Quail	403634-01	Y	72-2(A)			72-7(A)		
71-1(B)			72-2(B)			72-7(B)		
71-2(A)			72-3(A)			122-1(A)		
71-2(B)			72-3(B)			122-1(B)		
71-3			72-3(C)			122-2		
71-4(A)			72-3(D)			123-1(A)		
71-4(B)			72-3(E)			123-1(B)		
71-5(A)			72-3(F)			123-2		
71-5(B)			72-4(A)			124-1		
72-1(A)			72-4(B)			124-2		
72-1(B)			72-5			141-1		
72-1(C) trout	404945-01	N	72-6			141-2		
72-1(D) Bluegill	403634-01	Y				141-5		

Y=Acceptable (Study satisfied Guideline)/Concur
P=Partial (Study partially fulfilled Guideline but additional information is needed
S=Supplemental (Study provided useful information but Guideline was not satisfied)
N=Unacceptable (Study was rejected)/Nonconcur

1/36

DP BARCODE: D176001 REREG CASE #

CASE#: 301631 DATA PACKAGE RECORD DATE: 03/23/92
SUBMISSION: S414529 BEAN SHEET Page 1 of 1

* * * CASE/SUBMISSION INFORMATION * * *

CASE TYPE: REREGISTRATION ACTION: 627 GENERIC DATA SUBMISSION
CHEMICALS: 088004 1-Hydroxy-2-(1H)-pyridinethione, sodium salt 100.00 %

ID#: 088004
COMPANY:
PRODUCT MANAGER: 72 LARRY SCHNAUBELT 703-308-8058 ROOM: CS1 3C3
PM TEAM REVIEWER: LARRY SCHNAUBELT 703-308-8058 ROOM: CS1 3C3
RECEIVED DATE: 03/06/92 DUE OUT DATE: 07/04/92

* * * DATA PACKAGE INFORMATION * * *

DP BARCODE: 176001 EXPEDITE: N DATE SENT: 03/23/92 DATE RET.: / /
CHEMICAL: 088004 1-Hydroxy-2-(1H)-pyridinethione, sodium salt
DP TYPE: 001 Submission Related Data Package
ADMIN DUE DATE: 07/21/92 CSF: N LABEL: N

ASSIGNED TO	DATE IN	DATE OUT
DIV : EFED	03/24/92	/ /
BRAN: EEB	03/24/92	/ /
SECT:	/ /	/ /
REVR :	/ /	/ /
CONTR:	/ /	/ /

* * * DATA REVIEW INSTRUCTIONS * * *

For the attached reregistration case, please identify all applicable data requirements and note those for which adequate cata have not been submitted to the Agency.

PLEASE REVIEW BLOWBACKS

NTOMPKINS(LSCHNAUBELT)

* * * ADDITIONAL DATA PACKAGES FOR THIS SUBMISSION * * *

DP BC	BRANCH/SECTION	DATE OUT	DUE BACK	INS	CSF	LABEL

DP BARCODE: D176132 REREG CASE #

CASE: 819311 DATA PACKAGE RECORD DATE: 03/25/92
SUBMISSION: S414777 BEAN SHEET Page 1 of 1

* * * CASE SUBMISSION INFORMATION * * *

CASE TYPE: REREGISTRATION ACTION: 627 GENERIC DATA SUBMISSION
CHEMICALS: 088004 1-Hydroxy-2-(1H)-pyridinethione, sodium salt 100.00 %

ID#: 088004
COMPANY:
PRODUCT MANAGER: 72 LARRY SCHNAUBELT 703-308-8058 ROOM: CS1 2C3
PM TEAM REVIEWER: LARRY SCHNAUBELT 703-308-8058 ROOM: CS1 2C3
RECEIVED DATE: 03/06/92 DUE OUT DATE: 07/04/92

* * * DATA PACKAGE INFORMATION * * *

DP BARCODE: 176132 EXPEDITE: N DATE SENT: 03/25/92 DATE RET.: / /
CHEMICAL: 088004 1-Hydroxy-2-(1H)-pyridinethione, sodium salt
DP TYPE: 001 Submission Related Data Package
ADMIN DUE DATE: 07/23/92 CSF: N LABEL: N

ASSIGNED TO	DATE IN	DATE OUT
DIV : EFED	03/26/92	/ /
BRAN: EEB	03/26/92	/ /
SECT:	/ /	/ /
REVR :	/ /	/ /
CONTR:	/ /	/ /

* * * DATA REVIEW INSTRUCTIONS * * *

For the attached reregistration case, please identify all applicable data requirements and note those for which adequate data have not been submitted to the Agency.

PLEASE REVIEW BLOWBACKS

NTONFKINS(LSCHNAUBELT)

* * * ADDITIONAL DATA PACKAGES FOR THIS SUBMISSION * * *

DP BC	BRANCH/SECTION	DATE OUT	DUE BACK	INS	CSF	LABEL

3

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

OFFICE OF
PESTICIDES AND TOXIC
SUBSTANCES

MEMORANDUM

SUBJECT: Data Review of Sodium Omadine
DP Barcode: D176132, D176001
ID No: 088004

FROM: Douglas J. Urban, Acting Chief
Ecological Effects Branch
Environmental Fate and Effects Division (H7507C) 10/1/92

TO: Larry Schnaubelt, PM 72
Reregistration Branch
Special Review/Reregistration Division (H7508W)

EEB has reviewed the bobwhite quail LD_{50}, rainbow trout LC_{50}, and bluegill sunfish LC_{50} study for sodium omadine. The three tests were performed with a TEP containing ~40% sodium omadine in accordance with an EEB topical summary (dated Dec. 7, 1984) that stipulated that testing should be performed with the manufacturing use product or highest % active ingredient end use product.

The bobwhite quail and bluegill sunfish studies satisfy guideline requirements. The rainbow trout study does not satisfy the guideline requirements. Measured concentrations decreased substantially during the test period, often to the point where sodium omadine was no longer detectable (< 3.5 μg a.i./l). Consequently, the actual concentrations to which the test organisms were exposed are unknown. A flow-through test may help maintain constant concentrations of test material in test solutions. The test does provide some useful information as it indicates that the LC_{50} < 7.3 μg/l and sodium omadine (as a formulated product) is very highly toxic to rainbow trout, but a precise LC_{50} is still necessary in order to satisfy guideline requirements.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

MEMORANDUM

SUBJECT: Data Review of Sodium Omadine
DP Barcode: D176132, D176001
ID No: 088004

FROM: Douglas J. Urban, Acting Chief
Ecological Effects Branch
Environmental Fate and Effects Division (H7507C)

TO: Larry Schnaubelt, PM 72
Reregistration Branch
Special Review/Reregistration Division (H7508W)

EEB has reviewed the bobwhite quail LD_{50}, rainbow trout LC_{50}, and bluegill sunfish LC_{50} study for sodium omadine. The three tests were performed with a TEP containing ~40% sodium omadine in accordance with an EEB topical summary (dated Dec. 7, 1984) that stipulated that testing should be performed with the manufacturing use product or highest % active ingredient end use product.

The bobwhite quail and bluegill sunfish studies satisfy guideline requirements. The rainbow trout study does not satisfy the guideline requirements. Measured concentrations decreased substantially during the test period, often to the point where sodium omadine was no longer detectable (< 3.5 µg a.i./l). Consequently, the actual concentrations to which the test organisms were exposed are unknown. A flow-through test may help maintain constant concentrations of test material in test solutions. The test does provide some useful information as it indicates that the LC_{50} < 7.3 µg/l and sodium omadine (as a formulated product) ~~as~~ is very highly toxic to rainbow trout, but a precise LC_{50} is still necessary in order to satisfy guideline requirements.

CONCURRENCES								
SYMBOL	H7507C	H7507C	H7507C					
SURNAME	H. Mayfield	Vaughan	[illegible]					
DATE	9/24/92	10.1.92	10/1/92					

EPA Form 1320-1 (12-70) *U.S.GPO:1989-624-485/10186 OFFICIAL FILE COPY

As sodium omadine is a microbiocide, microbiostat, and fungicide that is registered for indoor and indoor industrial nonfood uses only, under the current policy only a single freshwater fish test is required. Although the rainbow trout is the preferred species, the guidelines have been satisfied by testing with the bluegill sunfish. If the use pattern of sodium omadine is altered, the trout study may need to be repeated.

Attached is a table reiterating the current status of sodium omadine.

If you have any questions please call Heather Mansfield at 305-5064.

Date: 9/25/92
Case No: 819311
Chemical No: 088004

PHASE IV
DATA REQUIREMENTS FOR
ECOLOGICAL EFFECTS BRANCH
SODIUM OMADINE

Data Requirements	Composition[1]	Use Pattern[2]	Does EPA Have Data To Satisfy This Requirement? (Yes, No)	Bibliographic Citation (MRID, date study was reviewed)	Must Additional Data Be Submitted under FIFRA3(c)(2)(B)?
6 Basic Studies in Bold					
71-1(a) Acute Avian Oral, Quail	TGAI	---	No	----------	No
71-1(b) Acute Avian Oral, Quail/Duck	TEP (42%)[3]	F,M	Yes	403634-01, 9/24/92	No
71-2(a) Acute Avian Diet, Quail	TEP (40%)[3]	F,M	Yes	00073656, 1976	No
71-2(b) Acute Avian Diet, Duck	TEP (40%)[3]	F,M	Yes	00073657, 1976	No
71-3 Wild Mammal Toxicity	----------	---	No	----------	No
71-4(a) Avian Reproduction, Quail	----------	---	No	----------	No
71-4(b) Avian Reproduction, Duck	----------	---	No	----------	No
71-5(a) Simulated Terrestrial Field Study	----------	---	No	----------	No
71-5(b) Actual Terrestrial Field Study	----------	---	No	----------	No
72-1(a) Acute Fish Toxicity Bluegill	TGAI	---	No	----------	No
72-1(b) Acute Fish Toxicity Bluegill	TEP (42%)[3]	F,M	Yes	403585-01, 9/24/92	No
	TEP (4%)[4]	F,M	Yes	LAOMAD01, 1975	No
72-1(c) Acute Fish Toxicity Rainbow Trout	TGAI	---	No	----------	No
72-1(d) Acute Fish Toxicity Rainbow Trout	TEP (42%)[3]	F,M	No	404945-01, 9/24/92	No[6]
	TEP (4%)[4]	F,M	Yes	LAOMAD02, 1975	No
72-2(a) Acute Aquatic Invertebrate Toxicity	TGAI	---	No	----------	No
72-2(b) Acute Aquatic Invertebrate Toxicity	TEP (40%)[3]	F,M	Yes	0010228, 1976	No
72-3(a) Acute Estu/Mari Tox Fish	TGAI	---	No	----------	No
72-3(b) Acute Estu/Mari Tox Mollusk	TGAI	---	No	----------	No
72-3(c) Acute Estu.Mari Tox Shrimp	TGAI	---	No	----------	No

* In Bibliographic Citation column indicates study may be upgradeable

Date: 9/25/92
Case No: 819311
Chemical No: 088004

PHASE IV
DATA REQUIREMENTS FOR
ECOLOGICAL EFFECTS BRANCH
SODIUM OMADINE

Data Requirements	Composition[1]	Use Pattern[2]	Does EPA Have Data To Satisfy This Requirement? (Yes, No)	Bibliographic Citation (MRID, date study was reviewed)	Must Additional Data Be Submitted under FIFRA3(c)(2)(B)?
72-3(d) Acute Estu/Mari Tox Fish	(TEP)	---	No	----------	No
72-3(e) Acute Estu/Mari Tox Mollusk	(TEP)	---	No	----------	No
72-3(f) Acute Estu/Mari Tox Shrimp	(TEP)	---	No	----------	No
72-4(a) Early Life-Stage Fish		---	No	----------	No
72-4(b) Live-Cycle Aquatic Invertebrate		---	No	----------	No
72-5 Life-Cycle Fish		---	No	----------	No
72-6 Aquatic Org. Accumulation		---	No	----------	No
72-7(a) Simulated Aquatic Field Study		---	No	----------	No
72-7(b) Actual Aquatic Field Study		---	No	----------	No
122-1(a) Seed Germ./Seedling Emerg.		---	No	----------	No
122-1(b) Vegetative Vigor		---	No	----------	No
122-2 Aquatic Plant Growth		---	No	----------	No
123-1(a) Seed Germ./Seedling Emerg.		---	No	----------	No
123-1(b) Vegetative Vigor		---	No	----------	No
123-2 Aquatic Plant Growth		---	No	----------	No
124-1 Terrestrial Field Study		---	No	----------	No
124-2 Aquatic Field Study		---	No	----------	No
141-1 Honey Bee Acute Contact		---	No	----------	No
141-2 Honey Bee Residue on Foliage		---	No	----------	No
141-5 Field Test for Pollinators		---	No	----------	No

* In Bibliographic Citation column indicates study may be upgradeable

1. Composition: TGAI = Technical grade of the active ingredient; PAIRA = Pure active ingredient, radiolabeled; TEP = Typical end-use product

2. Use Patterns: A = Terrestrial Food Crop; B = Terrestrial Feed Crop; C = Terrestrial Non-Food Crop; D = Aquatic Food Crop; E = Aquatic Non-Food Outdoor; F = Aquatic Non-Food Industrial; G = Aquatic Non-Food Residential; H = Greenhouse Food Crop; I = Greenhouse Non-Food Crop; J = Forestry; K = Outdoor Residential; L = Indoor Food; M = Indoor Non-Food; N = Indoor Medical; O = Indoor Residential; Z = Use Group for Site 00000

3. Data is required to support the manufacturing use product or highest percentage active ingredient end use product.

4. The 4% a.i. formulation may be characterized as very highly toxic to coldwater fish and slightly toxic to warmwater fish.

5. Under current policy, only a single freshwater fish test is required for indoor nonfood use chemicals. Although the rainbow trout is the preferred species, the guidelines have been satisfied by testing with the bluegill sunfish. If the use pattern of sodium omadine is altered, the trout study may need to be repeated.

* In Bibliographic Citation column indicates study may be upgradeable

DATA EVALUATION RECORD

1. **CHEMICAL:** Sodium Omadine. Shaughnessey No. 088004.

2. **TEST MATERIAL:** Sodium OMADINE®; Lot No. F113C; 41.9% active ingredient; an aqueous solution.

3. **STUDY TYPE:** Freshwater Fish Static Acute Toxicity Test. Species Tested: Bluegill Sunfish (*Lepomis macrochirus*).

4. **CITATION:** Ewell, W.S. and F.J. O'Boyle. 1987. Acute Aquatic Effects of Sodium OMADINE® on the Bluegill Sunfish, *Lepomis macrochirus*. Study No. EN-413-YLX001-2. Performed by Health and Environment Laboratories, Eastman Kodak Company, Rochester, NY. Submitted by Olin Corporation, Stamford, CT. EPA MRID No. 403585-01.

5. **REVIEWED BY:**

Rosemary Graham Mora, M.S.
Associate Scientist
KBN Engineering and
Applied Sciences, Inc.

Signature: Rosemary Graham Mora
Date: 5/26/92

6. **APPROVED BY:**

Louis M. Rifici, M.S.
Associate Scientist
KBN Engineering and
Applied Sciences, Inc.

Signature: Louis M Rifici
Date: 5/26/92

Heather Mansfield 9/24/92

Henry T. Craven, M.S.
Supervisor, EEB/EFED
USEPA

Signature: Henry T. Craven
Date: 10/1/92

7. **CONCLUSIONS:** This study is scientifically sound and meets the guideline requirements for an acute toxicity test using freshwater fish. The 96-hour LC_{50} was 8.1 mg a.i./l, based on mean measured concentrations, which classifies Sodium OMADINE® (as a formulated product) as moderately toxic to *Lepomis macrochirus*. The NOEC was 0.89 mg a.i./l.

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

9. **BACKGROUND:**

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

11. **MATERIALS AND METHODS:**

A. **Test Animals:** Juvenile *Lepomis macrochirus* were obtained from Aquatic Research Organisms, Hampton, NH. The fish were maintained at the testing facility in test dilution water for at least two weeks prior to test initiation. The average weight of the control fish were determined at the start of the test.

B. **Test System:** The test was conducted under static conditions in 30.5-cm cuboidal Pyrex® chromatography jars containing 20 l of test solution.

The photoperiod was 16 hours of light and 8 hours of darkness with 20-minute transition periods. Test temperature was maintained at 20 ±1°C. Beginning at 48 hours, continuous aeration was provided at a rate of 0.05 l/minute.

The dilution water (treated Lake Ontario water) was obtained from the Kodak Park Lake Station Water Treatment Facility. The water was directed through a series of filters (3 µm and activated carbon) and a tempering heat-exchange unit. Prior to the heat-exchange unit, 150 ppb of $Na_2S_2O_3$ were injected into the filtered dilution water. "This treatment further reduces trace levels of residual chlorine." The dilution water was passed through a degassing unit and held in an open aeration basin prior to use. The water had a hardness and alkalinity of 130 and 97 mg/l as $CaCO_3$, respectively, a conductivity of 310 µmhos/cm, a pH of 8.3, and a residual chlorine of <3 µg/l.

The stock solution (1.0 g a.i./l) was prepared by dissolving 2.5 g of test material in 1 l of distilled water. The exposure solutions were prepared by combining an appropriate amount of the stock solution with dilution water to a total volume of 20 l.

C. **Dosage:** Ninety-six-hour static acute test. Based on preliminary testing, five nominal test concentrations (0.625, 1.25, 2.5, 5.0, and 10.0 mg a.i./l) were selected for this study. A dilution water control was also included.

D. **Design:** Ten fish were distributed to each of two exposure vessels (20 fish per concentration). "Sequential randomization was accomplished by allocating to each vessel no more than 20% of any one

(1

set of test organisms at a time." The biomass loading rate in the control was <1.0 g/l/day.

Observations of mortality and sublethal effects were made at 0 and 6 hours and every 24 hours thereafter. Dissolved oxygen concentration (DO), temperature, and pH were measured in each test vessel at 0, 24, 48, 72, and 96 hours.

The concentration of Sodium OMADINE® for each replicate was determined at test initiation and test termination using high pressure liquid chromatography.

E. **Statistics:** The LC_{50} values and their 95% confidence intervals were determined using the computer program developed by C.E. Stephan (1977) and ASTM (1984).

12. **REPORTED RESULTS:** Mean measured concentrations were determined for each replicate vessel (Table 2, attached). Replicate B of the 1.25 mg a.i./l nominal test level was "apparently not dosed during set-up." This concentration was not included in the calculation of the LC_{50} value for B replicates.

Sixty-five percent mortality was observed at nominal concentrations 10 mg a.i./l and 0-30% mortality was noted at nominal concentrations ≤5.0 mg a.i./l (Table 1, attached). No mortality was observed in the control vessels. No adverse effects were noted at nominal concentrations ≤1.25 mg a.i./l.

Based on mean measured concentrations, the 96-hour LC_{50} (95% confidence interval) and NOEC were 9.6 (5.6-48.0) and 0.88 mg a.i./l, respectively, for A replicates, and 7.6 (5.2-12.0) and 2.2 mg a.i./l, respectively, for B replicates.

During the study, the DO was ≥4.8 mg/l, the pH was 7.6-8.5, and the temperature was 20°C.

13. **STUDY AUTHOR'S CONCLUSIONS/QUALITY ASSURANCE MEASURES:** "The results of this test indicate that an isolated or intermittent exposure to a concentration of the test article Sodium OMADINE® equal to or less than 0.88 mg/L is unlikely to affect bluegill sunfish adversely."

A GLP statement was included in the report indicating that this study meets the requirements of 40 CFR Part 160. This statement was signed by the Study Director. Quality assurance statements were also included.

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

A. **Test Procedure:** The test procedures were generally in accordance with the SEP, except for the following:

The report did not indicate whether the technical grade on the test material was used. The percentage of active ingredient was 41.9%, therefore, it is likely that a formulated product was used; in which case, a control containing the inert material should have been included in the study.

Each treatment group should be exposed to a concentration at least 60% of the next highest concentration; for this study, concentrations were 50% of the next highest.

No slope from the probit analysis was reported.

The dilution water was apparently prepared with dechlorinated water. The SEP discourages the use of dechlorinated water because removal of chlorine is rarely complete and residual chlorine can be toxic to aquatic organisms. However, it is probably acceptable for this study since the dilution water analysis reported levels of residual chlorine <3 µg/l.

Pretest mortality was not reported; the SEP requires no more than 3% mortality in the 48 hours prior to test initiation.

The size of the test organisms was not reported; the SEP recommends 0.1-5.0 g fish. In addition, the longest fish must not more than twice the shortest fish.

The biomass loading rate for this test (<1.0 g/l) may have been higher than recommended (≤0.8 g/l).

The method used to maintain the test temperature (i.e., air or water bath) was not reported.

The test temperature were not recorded at least every six hours as recommended.

B. **Statistical Analysis:** The reviewer used EPA's Toxanal computer program to determine the 96-hour LC_{50} and its 95% confidence interval (printout, attached). The reviewer calculated mean measured concentrations for each treatment (0.5, 0.89, 2.3, 5.1, and 11.3 mg

a.i./l). Based on the reviewer's analysis using treatment mean measured concentrations, the 96-hour LC_{50} (95% confidence interval) was 8.1 (6.1-12.8) mg a.i./l and is similar to the LC_{50} values presented by the authors. The slope of the concentration-response curve was 2.9.

C. **Discussion/Results:** The deviations listed above probably did not affect the test results. This study is scientifically sound and meets the guideline requirements for an acute toxicity study using freshwater fish. Based on mean measured concentrations, the 96-hour LC_{50} was 8.1 mg a.i./l, which classifies Sodium OMADINE® (as a formulated product) as moderately toxic to *Lepomis macrochirus*. The NOEC was 0.89 mg a.i./l.

D. **Adequacy of the Study:**

(1) **Classification:** Core for formulated product.

(2) **Rationale:** N/A.

(3) **Repairability:** N/A.

15. **COMPLETION OF ONE-LINER:** Yes, May 17, 1992.

SODIUM OMADINE

Page _____ is not included in this copy.

Pages 15 through 16 are not included in this copy.

The material not included contains the following type of information:

_____ Identity of product inert ingredients.

_____ Identity of product impurities.

_____ Description of the product manufacturing process.

_____ Description of quality control procedures.

_____ Identity of the source of product ingredients.

_____ Sales or other commercial/financial information.

_____ A draft product label.

_____ The product confidential statement of formula.

_____ Information about a pending registration action.

X FIFRA registration data.

_____ The document is a duplicate of page(s) _____.

_____ The document is not responsive to the request.

The information not included is generally considered confidential by product registrants. If you have any questions, please contact the individual who prepared the response to your request.

ROSEMARY GRAHAM MORA SODIUM OMADINE BLUEGILL 15 MAY 1992

****

CONC.	NUMBER EXPOSED	NUMBER DEAD	PERCENT DEAD	BINOMIAL PROB.(PERCENT)
11.3	20	13	65	13.1588
5.1	20	6	30	5.765915
2.3	20	1	5	2.002716E-03
.89	10	0	0	9.765625E-02
.5	20	0	0	9.536742E-05

THE BINOMIAL TEST SHOWS THAT 0 AND +INFINITY 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 8.053621

RESULTS CALCULATED USING THE MOVING AVERAGE METHOD

SPAN	G	LC50	95 PERCENT CONFIDENCE LIMITS	
1	.8069815	8.053621	4.369344	24.33243

RESULTS CALCULATED USING THE PROBIT METHOD

ITERATIONS	G	H	GOODNESS OF FIT PROBABILITY
5	.2232337	1	.9916121

SLOPE = 2.921641

95 PERCENT CONFIDENCE LIMITS = 1.541235 AND 4.302046

LC50 = 8.109774

95 PERCENT CONFIDENCE LIMITS = 6.062925 AND 12.75201

LC10 = 2.980722

95 PERCENT CONFIDENCE LIMITS = 1.401115 AND 4.19338

****

Shaughnessey # 088004 Chemical Name Sodium OMADINE Chemical Class _____ Page 1 of 1

Study/Species/Lab/ MRID #	Chemical % a.i.	Results	Reviewer/ Date	Validation Status
48-Hour EC_{50} Species: Lab: MRID #	_____	EC_{50} - pp 95% C.L. ( ) Control Mortality (%) - Solvent Control Mortality (%) - Slope - # Animals/Level - Temperature - 48-Hour Dose Level pp /(% Effect) ( ), ( ), ( ), ( ), ( ) Comments:	_____	_____
96-Hour LC_{50} Species: Lepomis macrochirus Lab: Kodak Health and Environment Laboratories. MRID # 403585-01	41.9%	LC_{50} - 8.1 pp m* 95% C.L. probit (6.1-12.8) Control Mortality (%) - 0 Solvent Control Mortality (%) - NA Slope - 2.9 # Animals/Level - 20① Temperature - 20°C 96-Hour Dose Level pp m*/(% Mortality) 0.5 (0), 0.89 (0), 2.3 (5), 5.1 (30), 11.3 (65) Comments: * Based on mean measured concentration ① 10 Animals at 0.89 mg/l	ROM 5/17/92	Core

8

DATA EVALUATION RECORD

1. **CHEMICAL:** Sodium Omadine. Shaughnessey No. 088004.

2. **TEST MATERIAL:** Sodium OMADINE®; Lot No. F113C; 41.9% active ingredient; an aqueous solution.

3. **STUDY TYPE:** Freshwater Fish Static Acute Toxicity Test. Species Tested: Rainbow Trout (Salmo gairdneri).

4. **CITATION:** O'Boyle, F.J. and W.S. Ewell. 1988. Acute Aquatic Effects of Sodium OMADINE® on the Rainbow Trout, Salmo gairdneri. Study No. EN-412-YLX001-2. Performed by Health and Environment Laboratories, Eastman Kodak Company, Rochester, NY. Submitted by Olin Corporation, Stamford, CT. EPA MRID No. 404945-01.

5. **REVIEWED BY:**
Heather N. Mansfield, Zoologist
Ecological Effects Branch
Environmental Fate and Effects Division
Signature: Heather Mansfield
Date: 9/25/92

6. **APPROVED BY:**
Allen Vaughan, Acting Head, Section 2
Ecological effects Branch
Environmental Fate and Effects Division
Signature: Allen W. Vaughan
Date: 9.30.92

7. **CONCLUSIONS:** This study is scientifically sound, but does not meet the guideline requirements for an acute toxicity test using freshwater fish. It is clear from the study that sodium omadine can be characterized as very highly toxic to rainbow trout as the 96-hour LC_{50} < 7.3 µg a.i./l. However, a precise LC_{50} could not be determined as the actual concentrations to which several levels of test organisms were exposed are unknown.

8. **RECOMMENDATIONS:** Repeating the test under flow through conditions may help maintain the amount of a.i. in the test solutions.

9. **BACKGROUND:**

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

11. **MATERIALS AND METHODS:**

A. Test Animals: Juvenile Salmo gairdneri were obtained from Aquatic Research Organisms, Hampton, NH. The fish were maintained at the testing facility in test dilution water for at

DATA EVALUATION RECORD

1. **CHEMICAL:** Sodium Omadine. Shaughnessey No. 088004.

2. **TEST MATERIAL:** Sodium OMADINE®; Lot No. F113C; 41.9% active ingredient; an aqueous solution.

3. **STUDY TYPE:** Freshwater Fish Static Acute Toxicity Test. Species Tested: Rainbow Trout (*Salmo gairdneri*).

4. **CITATION:** O'Boyle, F.J. and W.S. Ewell. 1988. Acute Aquatic Effects of Sodium OMADINE® on the Rainbow Trout, *Salmo gairdneri*. Study No. EN-412-YLX001-2. Performed by Health and Environment Laboratories, Eastman Kodak Company, Rochester, NY. Submitted by Olin Corporation, Stamford, CT. EPA MRID No. 404945-01.

5. **REVIEWED BY:**

Rosemary Graham Mora, M.S.
Associate Scientist
KBN Engineering and
Applied Sciences, Inc.

Signature: Rosemary Graham Mora
Date: 5/26/92

6. **APPROVED BY:**

Louis M. Rifici, M.S.
Associate Scientist
KBN Engineering and
Applied Sciences, Inc.

Signature: Louis M Rifici
Date: 5/26/92

Henry T. Craven, M.S.
Supervisor, EEB/EFED
USEPA

Signature:
Date:

7. **CONCLUSIONS:** This study is not scientifically sound and does not meet the guideline requirements for an acute toxicity test using freshwater fish. The actual concentrations to which the test organisms were exposed are unknown. The 96-hour LC_{50} was 7.3 µg a.i./l, based on mean measured concentrations, which classifies Sodium OMADINE® (as a formulated product) as very highly toxic to *Salmo gairdneri*. The NOEC was 2.2 µg a.i./l.

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

9. **BACKGROUND:**

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

least two weeks prior to test initiation. The average weight of the control fish were determined at the start of the test.

B. **Test System:** The test was conducted under static conditions in 30.5-cm cuboidal Pyrex® chromatography jars containing 20 l of test solution.

The photoperiod was 16 hours of light and 8 hours of darkness with 20-minute transition period. Test temperature (12 ±1°C) was maintained by a refrigerated water bath. Continuous aeration was provided at a rate of 0.05 l/minute.

The dilution water (treated Lake Ontario water) was obtained from the Kodak Park Lake Station Water Treatment Facility. The water was directed through a series of filters (3 µm and activated carbon) and a tempering heat-exchange unit. Prior to the heat-exchange unit, 150 ppb of $Na_2S_2O_3$ were injected into the filtered dilution water. "This treatment further reduces trace levels of residual chlorine." The dilution water was passed through a degassing unit and held in an open aeration basin prior to use. The water had a hardness and alkalinity of 130 and 94 mg/l as $CaCO_3$, respectively, a conductivity of 320 µmhos/cm, a pH of 8.2, and a residual chlorine of <3 µg/l.

The stock solution (10 mg a.i./l) was prepared by dissolving 25 mg of test material in 1 l of dilution water. The exposure solutions were prepared by combining an appropriate amount of the stock solution with dilution water to a total volume of 20 l.

C. **Dosage:** Ninety-six-hour static acute test. Based on preliminary testing, six nominal test concentrations (2.5, 5, 10, 20, 40, and 80 µg a.i./l) were selected for this study. A dilution water control was also included.

D. **Design:** Ten rainbow trout were distributed to each of two exposure vessels (20 fish per concentration). "Sequential randomization was accomplished by allocating to each vessel no more than 20% of any one set of test organisms at a time." The biomass loading rate in the control was <1.0 g/l/day.

Observations of mortality and sublethal effects were made at 0 and 6 hours and every 24 hours thereafter. Dissolved oxygen concentration (DO), temperature, and pH were measured in each test vessel at 0, 24, 48, 72, and 96 hours.

The concentration of ionized OMADINE® present in each test vessel was determined at test initiation and test termination using differential pulse cathodic stripping voltammetry. The concentration of Sodium OMADINE® was determined by dividing the

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concentration of OMADINE® by 0.846. Test solutions were sampled for analysis when complete mortality was observed.

E. Statistics: The LC_{50} values and their 95% confidence intervals were determined using the computer program developed by C.E. Stephan (1977) and ASTM (1984).

12. REPORTED RESULTS: Mean measured concentrations were determined for each replicate vessel (Table 2, attached). "Referring to Table 2, it is apparent that the test article did not persist in the lower concentration exposure solutions (nominally 2.5, 5, and 10 µg/L) throughout the 96-hour period of the study. Additionally, a decrease in the test article concentration in the upper doses (nominally 20, 40, and 80 µg/L) during the first day of the exposure is verified by the analyses of the samples taken at time 30 hours of the study."

Complete mortality was observed at nominal concentrations ≥20 µg a.i./l and 0-10% mortality was noted at nominal concentrations <20 µg a.i./l (Table 1, attached). No mortality was observed in the control vessels. No adverse effects were noted at nominal concentrations <10 µg a.i./l. "The data suggest that the observed cessation of fish mortality over time may be due to the disappearance of the test article from the exposure solutions (and not due to attaining the actual threshold concentration for an acutely toxic response to Sodium OMADINE® in Salmo gairdneri)."

Based on mean measured concentrations, the 96-hour LC_{50} (95% confidence interval) and NOEC were 6.6 (4.7-11.0) and 1.8 µg a.i./l, respectively, for A replicates, and 8.0 (5.8-13.0) and 2.6 µg a.i./l, respectively, for B replicates.

During the study, the DO was ≥8.6 mg/l, the pH was 7.9-8.5, and the temperature was 12°C.

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

"The results of this study indicate that the test article Sodium OMADINE® is highly toxic to rainbow trout (Salmo gairdneri). An isolated or intermittent exposure to a concentration of Sodium OMADINE® greater than 1.8 µg/L is likely to affect rainbow trout adversely."

A GLP statement was included in the report indicating that this study meets the requirements of 40 CFR Part 160. This statement was signed by the Study Director. Quality assurance statements were also included.

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

A. Test Procedure: The test procedures were generally in accordance with the SEP, except for the following:

The final measured concentrations for the three highest test concentrations averaged 58-88% of initial measured concentrations. Final measurements for the three lowest concentrations were below detection limit. Therefore, the actual concentrations to which the test organisms were exposed are unknown.

Each treatment group should be exposed to a concentration at least 60% of the next highest concentration; for this study, concentrations were 50% of the next highest.

The dilution water was apparently prepared with dechlorinated water. The SEP discourages the use of dechlorinated water because removal of chlorine is rarely complete and residual chlorine can be toxic to aquatic organisms. However, it is probably acceptable for this study since the dilution water analysis reported levels of residual chlorine <3 µg/l.

Pretest mortality was not reported; the SEP requires no more than 3% mortality in the 48 hours prior to test initiation.

The size of the test organisms was not reported; the SEP recommends 0.1-5.0 g fish. In addition, the longest fish must not more than twice the shortest fish.

The biomass loading rate for this test (<1.0 g/l) may have been higher than recommended (≤0.8 g/l).

The test temperature were not recorded every 6 hours as recommended for a static test using a water bath.

B. Statistical Analysis: The reviewer used EPA's Toxanal computer program to determine the 96-hour LC_{50} value and its 95% confidence interval (printout, attached). The reviewer calculated mean measured concentrations for each treatment as an average of 0- and 96-hours measurements (adjusted to Sodium OMADINE®) (Table 2, attached) in order to estimate exposure concentrations. These calculations enabled the reviewer to determine that the 96-hour LC_{50} (95% confidence interval) was less than 7.3 (5.3-12) µg a.i./l. In order to satisfy guideline requirements, it is necessary to calculate the actual concentration that the organisms are exposed to.

C. Discussion/Results: This study is scientifically sound, but does not meet the guideline requirements for an acute toxicity

study using freshwater fish. Measured concentrations decreased substantially during the test period, often to the point where sodium omadine was no longer detectable (< 3.5 µg a.i./l). Consequently, the actual concentrations to which the test organisms were exposed are unknown. A flow-through test may help maintain constant concentrations of test material in test solutions. The test does provide some useful information as it indicates that the LC_{50} < 7.3 µg/l and Sodium OMADINE® (as a formulated product) as very highly toxic to Salmo gairdneri. A precise LC_{50} is still necessary in order to satisfy guideline requirements.

D. Adequacy of the Study:

(1) Classification: Supplemental for formulated product.

(2) Rationale: Some useful information was obtained, as the test indicated that the LC_{50} < 7.3 µg/l. However, as the actual concentrations to which the test organisms were exposed to at the lower test levels are unknown, this study may not satisfy the guideline requirements.

(3) Repairability: No.

15. COMPLETION OF ONE-LINER: Yes, May 15, 1992.

SODIUM OMADINE

Page _____ is not included in this copy.

Pages 25 through 26 are not included in this copy.

The material not included contains the following type of information:

_____ Identity of product inert ingredients.

_____ Identity of product impurities.

_____ Description of the product manufacturing process.

_____ Description of quality control procedures.

_____ Identity of the source of product ingredients.

_____ Sales or other commercial/financial information.

_____ A draft product label.

_____ The product confidential statement of formula.

_____ Information about a pending registration action.

X FIFRA registration data.

_____ The document is a duplicate of page(s) _____.

_____ The document is not responsive to the request.

The information not included is generally considered confidential by product registrants. If you have any questions, please contact the individual who prepared the response to your request.

ROSEMARY GRAHAM MORA SODIUM OMADINE RAINBOW TROUT 15 MAY 1992

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CONC.	NUMBER EXPOSED	NUMBER DEAD	PERCENT DEAD	BINOMIAL PROB.(PERCENT)
75.7	20	20	100	9.536742E-05
35.8	20	20	100	9.536742E-05
12	20	20	100	9.536742E-05
5.3	20	2	10	2.012253E-02
2.2	20	0	0	9.536742E-05

THE BINOMIAL TEST SHOWS THAT 5.3 AND 12 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 7.298917

WHEN THERE ARE LESS THAN TWO CONCENTRATIONS AT WHICH THE
PERCENT DEAD IS BETWEEN 0 AND 100, NEITHER THE MOVING AVERAGE
NOR THE PROBIT METHOD CAN GIVE ANY STATISTICALLY SOUND RESULTS.

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Shaughnessey # 088004 Chemical Name Sodium ORADINE® Chemical Class _____ Page 1 of 1

Study/Species/Lab/ MRID #	Chemical % a.i.	Results	Reviewer/ Date	Validation Status
48-Hour EC_{50}	_____	EC_{50} - pp 95% C.L. ( ) Control Mortality (%) - Solvent Control Mortality (%) - Species: Slope - # Animals/Level - Temperature - Lab: 48-Hour Dose Level pp /(% Effect) ( ), ( ), ( ), ( ), ( ) MRID # Comments:	_____	_____
96-Hour LC_{50}	41.9%	LC_{50} - 7.3 pp[b]* 95% C.L. Binomial (5.3, 12) Control Mortality (%) - 0 Solvent Control Mortality (%) - NA Species: Salmo gairdneri Slope - NA # Animals/Level - 20 Temperature - 12 Lab: Health and Environment Labs, Eastman Kodak 96-Hour Dose Level pp b* /(% Mortality) 2.2 (0), 5.3 (10), 12.0 (100), 35.8 (100), 75.7 (100) MRID # 404945-01 Comments: Mean measured concentration of a.i.	RDM 5/15/92	Invalid

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DATA EVALUATION RECORD

1. **CHEMICAL:** Sodium Omadine.
Shaughnessey No. 088004.

2. **TEST MATERIAL:** Sodium Omadine®; Sample No. F113C; 41.93% active ingredient; a clear amber liquid.

3. **STUDY TYPE:** Avian Single Dose Oral LD_{50} Test.
Species Tested: Bobwhite quail (*Colinus virginianus*).

4. **CITATION:** Grimes, J. and M. Jaber. 1987. Sodium Omadine: An Acute Oral Toxicity Study with the Bobwhite. Project No. 133-108. Performed by Wildlife International Ltd., Easton, MD. Submitted by Olin Corporation, New Haven, CT. EPA MRID No. 403634-01.

5. **REVIEWED BY:**

Mark A. Mossler, M.S.
Associate Scientist
KBN Engineering and
Applied Sciences, Inc.

Signature: Mark A. Mossler
Date: 6/9/92

6. **APPROVED BY:**

Michael Whitten, M.S.
Wildlife Toxicologist
KBN Engineering and
Applied Sciences, Inc.

Signature: Michael L. Whitten
Date: 6/9/92

Heather Mansfield 9/24/92

Henry T. Craven, M.S.
Supervisor, EEB/EFED
USEPA

Signature:
Date: Henry T. Craven 10/1/92

7. **CONCLUSIONS:** This study is scientifically sound and meets the requirements for an acute oral toxicity test using a formulated product. The LD_{50} (441 mg/kg as whole test material, 185 mg/kg as active ingredient) classifies Sodium Omadine® as moderately toxic to bobwhite quail. An NOEL was not established due to mortality, behavioral signs of toxicity, reduced food consumption, and reduced body weight gain at the lowest treatment level.

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

9. **BACKGROUND:**

5.0 hrs

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

11. **MATERIALS AND METHODS:**

A. **Test Animals:** The birds used in the study were 26-week-old bobwhite quail (*Colinus virginianus*) obtained from a supplier in Phillipsburg, NJ. The birds were pen-reared and phenotypically indistinguishable from wild birds. They were acclimated to the laboratory for 4 weeks prior to testing and ranged in weight from 171 to 215 g at test initiation. Except for a 15-hour fasting period immediately prior to dosing, water and a game bird ration were offered *ad libitum* during acclimation and testing. No antibiotics were administered during the test.

B. **Test System:** All birds were housed indoors in pens constructed of galvanized wire and galvanized sheeting (side walls). The floors (78 x 51 cm) of the pens were sloped giving a ceiling height which ranged from 20 to 25 cm. Fluorescent lights provided 8 hours of 130 lux illumination per day. The average temperature was 26 ±2°C and the average relative humidity was 65%.

C. **Dosage:** Fourteen-day single dose oral LD_{50} test. Six nominal dosages (150, 300, 600, 1200, 2400, and 4800 mg/kg of body weight) and a diluent (distilled water) control were used in the test. The dosages were not corrected for the percent active ingredient of the test substance.

D. **Design:** Groups of ten birds (five males and five females) were assigned to each treatment and control group by random draw. Each dosage group was assigned two pens in which the birds were segregated by sex.

The test substance was dispersed in distilled water and intubated directly into the crop or proventriculus of each bird using a stainless steel catheter. Each bird was individually weighed and dosed on the basis of milligrams of test substance per kilogram of body weight. The control birds received a corresponding volume of distilled water only. Each bird received a constant dosage volume of 6 ml per kilogram of body weight.

All birds were observed once a day during acclimation and at least twice daily during testing for mortality, signs of toxicity, and abnormal behavior. The birds

were individually weighed at test initiation and by group on days 3, 7, and 14. Group food consumption was determined for days 0-3, 4-7, and 8-14 by measuring the change in feed presented to the birds over a period of time. However, this is an estimate due to wastage by the birds.

E. **Statistics:** The LD_{50} was determined using a computer program that employed probit analysis, the moving average angle method, and binomial probability.

12. **REPORTED RESULTS:** There was no mortality in the control group. The birds in the control group were normal in appearance and behavior.

There was 10% mortality in the two lowest treatment groups, 70% mortality in the 600 mg/kg group, and 100% mortality in the three highest test groups.

At the 150 mg/kg dosage, signs of toxicity were first noted forty-five minutes after dosing and continued through the afternoon of day 6. The single mortality was noted on the morning of day 2. The remaining birds were normal in appearance and behavior from the morning of day 7 except for one male which maintained a ruffled appearance until day 9.

At the 300 mg/kg dosage, signs of toxicity were first noted forty minutes after dosing and continued through the morning of day 7. The single mortality was noted on the morning of day 2. The remaining birds were normal in appearance and behavior from the afternoon of day 7.

At the 600 mg/kg dosage, signs of toxicity were first noted forty minutes after dosing and continued through the afternoon of day 6. Mortalities were noted five hours after dosing, the mornings of day 1 and 2, and the afternoon of day 3. The remaining birds were normal in appearance and behavior from the morning of day 7 except for one male which maintained a ruffled appearance until the afternoon of day 13.

At the 1200 mg/kg dosage, signs of toxicity were first noted fifteen minutes after dosing. Three mortalities were noted within five hours after dosing and six birds were dead by the end of day 1. Signs of toxicity were noted in the sole surviving bird until day 3, at which time the bird was found dead.

At the 2400 mg/kg dosage, signs of toxicity were first noted one-hour after dosing. Three mortalities were noted within four and one-half hours after dosing and all birds were dead by the morning of day 1.

At the 4800 mg/kg dosage, signs of toxicity were noted immediately after dosing. Seven mortalities were noted within four and one-half hours after dosing and all birds were dead by the morning of day 1.

Signs of toxicity included lethargy and/or depression, reduced reaction to external stimuli (sound and movement), wing droop, loss of coordination, prostrate posture, loss of righting reflex, convulsions, coma, ruffled appearance, and lower limb weakness.

There was a reduction in body weight gain and feed consumption for males and females in the 300 and 600 mg/kg treatment groups in comparison to the controls for days 0 through 3 (Table 2, attached). This same trend was observed for the 150 mg/kg level birds, except feed consumption was only reduced among female birds. Effects on body weight and feed consumption at the 1200, 2400, and 4800 mg/kg dosage level were not evaluated due to total mortality.

13. **STUDY AUTHOR'S CONCLUSIONS/QUALITY ASSURANCE MEASURES:** The acute oral LD_{50} value for bobwhite quail exposed to sodium omadine was determined to be 441 mg/kg with a 95% confidence interval of 317-611 mg/kg. When adjusted to 100% active ingredient, the LD_{50} was 185 mg/kg. The no-observed-effect dosage was less than 150 mg/kg based on mortality, overt signs of toxicity, and body weight loss at the 150 mg/kg dosage.

Quality Assurance and Good Laboratory Practice statements were included in the report indicating compliance with the regulations set forth by the U.S. EPA with the exception that samples of the dosing solutions were not taken for confirmation of concentration.

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

A. **Test Procedure:** The test procedures were in accordance with Subdivision E and SEP guidelines with the following exceptions:

It was not stated if the birds were from the same hatch.

Necropsies were not performed. These are recommended, but not required by the guidelines.

Group body weights, rather than individual body weights, were taken at the end of the test.

It was not stated if the test material was technical or a formulated product.

B. **Statistical Analysis:** Using EPA's Toxanal program, the reviewer obtained the same results as the authors (see attached printout).

C. **Discussion/Results:** Since the report did not indicate that this test material was of technical grade, and the name of the test material is a registered trademark, the reviewer assumes that this test was conducted using a formulated product. Therefore, this study is scientifically sound and meets the requirements for an acute oral toxicity test using a formulated product. The LD_{50} value of 441 mg/kg classifies Sodium Omadine® as moderately toxic to bobwhite quail. When adjusted to 100% active ingredient, the LD_{50} was 185 mg/kg. The NOEL could not be determined due to mortality, sublethal effects, and reduced feed consumption and body weight gain at the lowest test dosage.

D. **Adequacy of the Study:**

(1) **Classification:** Core for a formulated product.

(2) **Rationale:** N/A.

(3) **Repairability:** N/A.

15. **COMPLETION OF ONE-LINER:** Yes, 5-18-92.

SODIUM OMADINE

Page 34 is not included in this copy.

Pages _____ through _____ are not included in this copy.

The material not included contains the following type of information:

_____ Identity of product inert ingredients.

_____ Identity of product impurities.

_____ Description of the product manufacturing process.

_____ Description of quality control procedures.

_____ Identity of the source of product ingredients.

_____ Sales or other commercial/financial information.

_____ A draft product label.

_____ The product confidential statement of formula.

_____ Information about a pending registration action.

X FIFRA registration data.

_____ The document is a duplicate of page(s) _____.

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The information not included is generally considered confidential by product registrants. If you have any questions, please contact the individual who prepared the response to your request.

MOSSLER SODIUM OMADINE COLINUS VIRGINIANUS 5-18-92

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CONC.	NUMBER EXPOSED	NUMBER DEAD	PERCENT DEAD	BINOMIAL PROB. (PERCENT)
4800	10	10	100	9.765625E-02
2400	10	10	100	9.765625E-02
1200	10	10	100	9.765625E-02
600	10	7	70	17.1875
300	10	1	10	1.074219
150	10	1	10	1.074219

THE BINOMIAL TEST SHOWS THAT 300 AND 1200 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 483.244

RESULTS CALCULATED USING THE MOVING AVERAGE METHOD

SPAN	G	LC50	95 PERCENT CONFIDENCE LIMITS	
4	.1677542	425.5973	254.4861	619.7327

RESULTS CALCULATED USING THE PROBIT METHOD

ITERATIONS	G	H	GOODNESS OF FIT PROBABILITY
6	.2268599	1	.4750239

SLOPE = 4.092341

95 PERCENT CONFIDENCE LIMITS = 2.143167 AND 6.041516

LC50 = 441.2813

95 PERCENT CONFIDENCE LIMITS = 316.5532 AND 610.883

LC10 = 215.9633

95 PERCENT CONFIDENCE LIMITS = 100.1547 AND 304.0465

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Shaughnessey # 088004 Chemical Name Sodium cyanide Chemical Class _____ Page 1 of 1

Study/Species/Lab/ MRID #	Chemical % a.i.	Results	Reviewer/ Date	Validation Status

14-Day Single Oral LD_{50}	41.93	LD_{50} = 441 * 95% C.L. (317-611) - probit; Control Mortality (%) = 0
		Slope = 4.1; # Animals/Level = 10; Age (Days) = 182
		Sex = 5♀ 5♂
		14-Day Dose Level mg/kg/(% Mortality)*
		150 (10), 300 (10), 600 (70), 1200 (100), 2400 (100), 4800 (100)
			H. Hollingsworth 5/16/92	Core for a formulated product

Species: Colinus virginianus Lab: Wildlife International MRID # 403634-01		Comments: * based on nominal conc. of total product. As active ingredient, the LD_{50} = 185 mg/kg with 95% C.L. could not be determined.		

8-Day Dietary LC_{50}		LC_{50} = pp 95% C.L. ( ) Control Mortality (%) = Slope = # Animals/Level = Age (Days) = Sex = 8-Day Dose Level pp /(% Mortality) ( ), ( ), ( ), ( ), ( )		
Species Lab MRID #		Comments:		

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