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FYI-0500-1380

**ECOLAB**



FYI-00-001380

Ecolab Center  
370 Wabasha St. N.  
St. Paul Minnesota 55102

Rob Harrington, Ph.D.  
Director, EH&S Compliance

MR 35925

May 15, 2000

OPPT Document Control Officer  
TSCA 8(e) Coordinator  
OPPTS  
USEPA  
401 M Street  
Washington, D.C. 20460



84000000020

RECEIVED  
OPPT 810  
2000 MAY 19 AM 11:01

Re: "FYI" Submission of Toxicology Study on N.A.S.

Ecolab Inc. wishes to submit the enclosed unaudited draft toxicity study under the FYI option to fulfill TSCA 8(e) reporting requirements. This information is being provided under FYI since this is the only long-term toxicity data to be generated on this chemical and therefore represents new or additional information. The data in the report clearly demonstrate at the highest dose tested, there were no significant toxicological effects, other than aspiration of small quantities of the test material, which resulted in lung injury. (Aspiration of test material is not considered to be a toxicological effect, but rather an artifact of dosing). Thus, the information does not qualify as demonstrating substantial risk and therefore is not reportable under 8(e).

N.A.S. (sodium 1-octane sulfonate), CASRN 5324-84-5 is a chemical that is used in cleaning and sanitizing products. This material was administered by gavage to rats at 50 and 200 mg/kg/day for a period of 90 days. No significant adverse effects related to the toxicity of the test material were noted. This study will also be submitted to the FIFRA Office as part of the process of listing it an inert ingredient in pesticidal formulations.

If you deem this material as requiring submission under 8(e), or if you have other questions regarding this submission, please contact me at 651-293-4148.

Sincerely,

Rob Harrington, Ph.D.  
Corporate Toxicologist  
Director, EH&S Compliance

Contain NO CBI

RECEIVED  
OPPT 810  
2000 JUN - 7 AM 7:19

**A 90-DAY ORAL (GAVAGE) TOXICITY  
STUDY IN RATS**

UNAUDITED DRAFT REPORT

OPPTS Guideline

870.1100

Author

Rusty E. Rush, M.S., LAT, DABT

Study Completed on

Performing Laboratory

Springborn Laboratories, Inc. (SLI)  
Ohio Research Center  
640 North Elizabeth Street  
Spencerville, OH 45887

SLI Study No.

3188.11

Submitted to:

Ecolab Inc.  
840 Sibley Memorial Hwy.  
Mendota Heights, MN 55118

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STATEMENT OF NO DATA CONFIDENTIALITY CLAIMS

No claim of confidentiality is made for any information contained in this study on the basis of its falling with the scope of FIFRA § 10(d)(1)(A), (B), or (C).

Company: \_\_\_\_\_

Company Agent: \_\_\_\_\_ Date: \_\_\_\_\_

\_\_\_\_\_  
Title

\_\_\_\_\_  
Signature



**A 07**

SLI Study No. 3188.11

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**QUALITY ASSURANCE STATEMENT**

This study was inspected by the Quality Assurance Unit and reports were submitted to management and the Study Director in accordance with SLI's Standard Operating Procedures as follows:

Phase

Date

Data Audits  
Draft Report Review

Reports Submitted to Study Director  
and Management

The final report has been reviewed to assure that it accurately describes the materials and methods, and the reported results accurately reflect the raw data.

\_\_\_\_\_  
Judy L. Rable, A.S., ALAT  
Senior Quality Assurance Auditor

Date \_\_\_\_\_

\_\_\_\_\_  
Anita M. Bosau, RQAP-GLP  
Director of Compliance Assurance

Date \_\_\_\_\_

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## SUMMARY

The purpose of this study was to evaluate the potential toxicity of NAS when administered orally, by gavage, to rats for a minimum of 90 consecutive days. The study design consisted of a control group and two treatment groups with 12 animals per sex in each group. The test article was administered as a single dose daily at dosage levels of 50 and 200 mg/kg/day. Control animals received RODI water under the same experimental conditions. Cage-side observations were performed between 30 and 90 minutes following dosing. In addition, detailed clinical observations were performed weekly prior to dosing. Individual body weights were recorded on day -1 and weekly thereafter during the study. Final body weights were obtained on the day of scheduled euthanasia (days 91/92). Food consumption was recorded weekly on the same days as body weights. Blood samples were collected prior to scheduled euthanasia (days 91/92) for evaluation of selected clinical pathology parameters. Ophthalmology examinations were performed on all animals on days -1 and 85. Each rat was subjected to a complete gross necropsy at the time of death or euthanasia. Fresh organ weights were obtained for surviving animals and selected tissues were preserved from all rats. All tissues and organs collected from control and high-dose animals and from animals found dead or euthanized during the study were examined microscopically.

Results: No toxicologically significant effects were noted during this study with regard to body weight/weight gain, food consumption, clinical pathology and organ weights. In addition, with the exception of the abnormalities noted grossly at necropsy and microscopically in the lungs and trachea, all other tissue/organs appeared normal.

There were several notable findings that occurred during this study. A dose-related increase in mortality, clinical abnormalities and gross necropsy findings was observed in several low- and high-dose males and females and was thought to be primarily associated with effects on the respiratory system. Based on the histopathological examination of the lungs and respiratory tree, it is the opinion of the Pathologist and Study Director that these findings were a secondary effect of inadvertent aspiration of the test article following dosing and not a result of systemic pulmonary toxicity. This conclusion is supported by the sporadic nature of the clinical effects and gross necropsy findings observed during the in-life phase of the study as well as the presence of necrosis and fibrinous exudate in the trachea of several animals. In addition, the chemical nature of this compound (i.e., long chain hydrocarbon) is known to be irritating to the respiratory tree and the pulmonary abnormalities observed during this study would be consistent with a chemical pneumonitis.

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Although the cause of the aspiration can not be positively determined, it is possible that a small amount of test article was deposited into the trachea as the gavage needle was being withdrawn from the esophagus. In addition, test article may have been forced from the stomach into the trachea by a build up of gas pressure in the stomach/intestinal tract as several animals were noted to be bloated during the study. However, direct pulmonary instillation of the test article during dosing does not appear to be the cause.

Conclusion: Based on the results of this study, oral administration of NAS did not produce any direct systemic effects in male or female rats at dosage levels up to 200 mg/kg/day. Secondary pulmonary aspiration of the test article appeared to produce adverse effects in several animals. However, these aspiration-related effects were not considered to be a result of test article-induced systemic toxicity.

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## I. INTRODUCTION

This report details the experimental procedures and results of a 90-day toxicity study with NAS when administered to rats via the oral (gavage) route of administration. The study was authorized by Ecolab Inc., Mendota Heights, Minnesota, and was conducted at Springborn Laboratories, Inc. (SLI), 640 North Elizabeth Street, Spencerville, Ohio. The laboratory rat was selected as the animal model for this study since it is one of the species recommended by the regulatory agencies for oral toxicity testing. Oral administration of the test article was selected since it is a potential route of human exposure. The protocol was signed by the Study Director on August 27, 1999 (GLP initiation date). The in-life phase of the study was initiated with test article administration on November 12, 1999 (day 1), and concluded with terminal euthanasia on February 10, 2000 (day 92).

A 21-day range-finding study was conducted prior to the main study in order to determine dosage levels for the main study. The in-life phase of the range-finding study began on September 1, 1999, and concluded on September 22, 1999. Methods and results for the range-finding study are presented in Appendix A.

## II. OBJECTIVE

The purpose of this study was to evaluate the potential toxicity of NAS when administered orally, by gavage, to rats for a minimum of 90 consecutive days. Data from this study may be used in the assessment of potential human risk.

## III. MATERIALS AND METHODS

### A. Experimental Protocol

The study protocol, protocol amendment and protocol deviations are included in Appendix B.

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**B. Test Article and Vehicle Control Material****1. Test Article Receipt, Identification and Storage**

The test article was received from the Sponsor and identified as follows:

| <u>Identification</u>          | <u>Assigned<br/>SLI ID's</u> | <u>Physical<br/>Description</u> | <u>Receipt<br/>Date</u> | <u>Expiration<br/>Date</u> |
|--------------------------------|------------------------------|---------------------------------|-------------------------|----------------------------|
| NAS, 100%<br>Batch No. B-20-17 | S99.003.3188                 | Clear colorless<br>liquid       | 08/25/99                | 08/23/00                   |

A 100 mL retention sample of test article was taken and stored at SLI. The retention sample was stored at -20°C. The remaining test article was stored at room temperature. Documentation concerning chemical identification, purity, strength, stability and other required data was the responsibility of the Sponsor.

**2. Vehicle Control Material**

The vehicle control material used in the preparation of dosing mixtures was reverse osmosis deionized (RODI) water from the tap in pharmacy.

**3. Dose Preparation**

The test article was dosed as received from the Sponsor and dispensed fresh daily for dosing. Desired dosage levels were achieved by adjusting the dose volume based on the density of the test article. The density of the test article was determined to be 1.13 g/mL at SLI.

**4. Analysis of Dosing Preparations**

No analytical analyses were performed at SLI since the test article was dosed as received from the Sponsor. Analytical confirmation of the test article purity was conducted by the Sponsor prior to in life initiation and following in-life completion. The results of these analyses are included in Appendix C.

**C. Animals and Animal Husbandry**

Animal housing and care were based on the standards established by the Association for Assessment and Accreditation of Laboratory Animal Care, International (AAALAC) and the guidelines set forth in the Guide for the Care

and Use of Laboratory Animals, NIH Publication No. 96-03, 1996. The study was conducted in compliance with the Animal Welfare Act as regulated by the USDA.

### 1. Animal Receipt, Identification and Housing

Fifty-three male and fifty-three female Sprague-Dawley Crl:CD®(SD)IGS BR rats were received at SLI on October 26, 1999, from Charles River Laboratories, Inc., Kingston, New York. At the time of receipt, each animal was identified with a temporary identification number recorded on the cage card and in the data records. The animals were gang-housed (two or three males or females per cage) for a period of seven days following receipt to allow the animals to adjust to the automatic watering system. During the remainder of the acclimation period and while on study, the animals were housed individually in suspended stainless steel cages. A metal ear tag displaying a unique identification number was used to permanently identify each animal assigned to the study. A cage card displaying the study, animal and group numbers, and sex was affixed to each cage. The cage cards were color-coded according to group number following randomization.

### 2. Acclimation

The animals were examined upon receipt and daily following separation from gang-housing (day -11) for signs of physical or behavioral abnormalities. General health/mortality and moribundity checks were performed twice daily, in the morning and afternoon. Individual body weights were determined on day -11 and prior to randomization on day -1. The animals were acclimated to the laboratory environment for a period of 16 days prior to randomization.

### 3. Diet and Drinking Water

PMI Certified Rodent Chow® #5002 (Purina Mills, Inc.) and municipal tap water were provided to the animals. Feed and water were offered *ad libitum* throughout the study with the exception that feed was withheld overnight prior to blood collection. The feed was analyzed by the supplier for nutritional components and environmental contaminants. The lot number and expiration date of each batch of feed used during the study were recorded. The tap water was purified by reverse osmosis and supplied to the animals by an automatic watering system or water bottles. Drinking water, collected from a point of use in the study room, was analyzed once during the study. Results of the feed and water analyses

are maintained at SLI. Within generally accepted limits, there were no contaminants in the diet or drinking water which would interfere with the conduct of the study.

#### 4. Environmental Conditions

The environmental controls in the animal room were set to maintain room temperature and relative humidity ranges of 65 to 79°F and 30 to 70%, respectively. Environmental control equipment was monitored and adjusted as necessary to minimize fluctuations in the animal room environment. Light timers were set to maintain a 12-hour light/12-hour dark cycle and the room ventilation was set to produce 10 to 15 air changes per hour. The room temperature and relative humidity were recorded daily and were within the specified ranges on each study day.

### D. Experimental Procedures

#### 1. Study Group Design

The study group design and dosage levels tested were as follows:

| Group | No. of Animals |        | Dosage Material | Dosage Level (mg/kg/day) | Dosage Volume (μL/kg) |
|-------|----------------|--------|-----------------|--------------------------|-----------------------|
|       | Male           | Female |                 |                          |                       |
| 1     | 12             | 12     | RODI Water      | 0                        | 880                   |
| 2     | 12             | 12     | NAS             | 50                       | 40                    |
| 3     | 12             | 12     | NAS             | 200                      | 180                   |

#### 2. Justification of Dose Level Selection

Dosage levels for this study were selected in an attempt to produce graded responses to the test article. The high-dose level was expected to produce toxic effects, but not excessive lethality. The low-dose level was expected to produce no observable effects. Dosage levels were selected by the Sponsor based on data from the range-finding study.

### 3. Randomization and Group Assignment:

On day -1, the animals were weighed and examined in detail for signs of physical disorder (detailed clinical observation). Animals determined to be suitable test subjects were assigned to groups using a computer randomization program. A separate randomization was generated for the main study animals and the toxicokinetic animals. The program ranked the animals according to day -1 body weights and randomly assigned the rats to study groups.

At randomization, the animals were approximately seven weeks of age with body weights ranging from 203 to 257 grams for males and 149 to 190 grams for females.

### 4. Treatment

Dosing preparations were administered orally (by gavage) as a single dose daily for a minimum of 90 consecutive days. Prior to each dose, the gavage needle was wiped clean with dry gauze to remove test article residue on the gavage needle. Individual doses were adjusted based on the most recent body weight data and were rounded to the nearest 1, 5 or 10  $\mu$ L, depending on the accuracy of the syringe that was used for dosing. The animals were dosed up to and including the day prior to scheduled necropsy.

## E. Parameters Evaluated

### 1. Clinical Observations

General health/mortality and moribundity checks were performed twice daily, in the morning and afternoon. Cage-side observations were performed between 30 and 90 minutes following dosing. In addition, detailed clinical observations were performed weekly prior to dosing.

### 2. Body Weights

Each animal was weighed prior to randomization on day -1. During the study, individual body weights were recorded weekly. A final body weight was recorded for each animal prior to necropsy on the day of scheduled euthanasia (days 91/92).

### 3. Food Consumption

Individual food consumption was recorded on day -1 and weekly thereafter on the same day as body weight measurements.

### 4. Clinical Pathology

Blood was collected from all animals on the day of scheduled euthanasia (days 91/92) for evaluation of selected hematology and biochemistry parameters. The blood samples were obtained via the orbital plexus while the animals were under light isoflurane anesthesia. Feed was withheld overnight prior to blood collection, however, water was available. Methods for clinical pathology determinations are presented in Appendix D. The following parameters were evaluated:

#### a. Hematology

Erythrocyte count (RBC)

Hematocrit (Hct)

Hemoglobin concentration (Hgb)

Mean corpuscular hemoglobin (MCH)

Mean corpuscular hemoglobin concentration (MCHC)

Mean corpuscular volume (MCV)

Platelet count

Total and differential leukocyte counts

Reticulocyte count (Reticulocyte slides were prepared but counts were not performed since this was not deemed necessary by the Study Director)

#### b. Biochemistry

Alanine aminotransferase (ALT)

Albumin

Albumin/globulin ratio (calculated)

Alkaline phosphatase

Aspartate aminotransferase (AST)

Calcium

Cholesterol

Blood creatinine

Gamma glutamyl transpeptidase (GGT)

Globulin (calculated)

Glucose

Electrolytes (sodium, potassium and chloride)

Phosphorus

Total bilirubin  
Total serum protein  
Triglycerides  
Urea nitrogen

#### 5. Ophthalmology

Ophthalmological examinations were performed on all rats by Dr. David A. Wilkie, a board-certified veterinary ophthalmologist, once prior to in-life initiation (day -1) and on day 85. Eyes were dilated using 0.5% Mydracyl® ophthalmic solution prior to biomicroscopic and indirect ophthalmoscopic examination.

#### 6. Gross Necropsy

All animals were subjected to a complete gross necropsy at the time of death or euthanasia. The necropsy examination included evaluation of the external surfaces of the body and all viscera. Five rats per sex per group were euthanized on days 91 or 92 by carbon dioxide inhalation followed by exsanguination, when possible. Each animal was dosed up to and including the day prior to scheduled necropsy. The animals were fasted overnight prior to scheduled euthanasia. A board-certified veterinary pathologist, Dr. J. Dale Thurman, was present at the scheduled necropsies.

Fresh organ weights were obtained at scheduled euthanasia for the liver, kidneys, adrenal glands, testes with epididymides, ovaries, spleen, thymus, brain, thyroid and heart of surviving animals. Paired organs were weighed together. The following organs and tissues, or representative samples, were preserved in 10% neutral buffered formalin:

Accessory genital organs (epididymides, seminal vesicles,  
and prostate or uterus and vagina)

Adrenals

All gross lesions

Aorta

Brain (including sections of medulla/pons, cerebellar cortex  
and cerebral cortex)

Cecum

Colon

Duodenum

Ear (for identification only)

Esophagus

Exorbital lachrymal glands

Eyes  
Femur (including articular surface) and bone marrow  
Heart  
Ileum  
Jejunum  
Kidneys  
Liver (3 sections collected)  
Lungs (infused with formalin) with bronchi  
Mammary gland  
Mandibular lymph node  
Mediastinal lymph node  
Mesenteric lymph node  
Pancreas  
Peripheral nerve (sciatic)  
Pituitary  
Rectum  
Skeletal muscle (thigh)  
Skin  
Spinal cord (cervical, midthoracic and lumbar)  
Spleen  
Sternum  
Stomach (glandular/nonglandular)  
Submaxillary salivary gland  
Testes/ovaries  
Thymus  
Thyroid/parathyroid  
Tongue  
Trachea  
Urinary bladder

#### 7. Histopathology

All tissues and organs obtained at necropsy from all animals in the control and high-dose groups, from all low-dose animals found dead, and the liver, lungs and selected gross lesions obtained from surviving low-dose animals at scheduled euthanasia were processed for histopathological examination. The tissues were trimmed, embedded in paraffin, sectioned and stained with hematoxylin and eosin. Histology processing was performed by HistoTechniques, Powell, Ohio, and the tissues were examined microscopically by Dr. Robert G. Geil, a board-certified veterinary pathologist.

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#### IV. STATISTICAL ANALYSES

Body weights, weight gain, food consumption, clinical pathology and organ weights were analyzed by One-Way Analysis of Variance (ANOVA) [1]. When significance was observed with ANOVA, group by group comparisons were performed using the Tukey-Kramer method [2]. All tests were two-tailed with a minimum significance level of 5% ( $p < 0.05$ ).

#### V. MAINTENANCE OF RAW DATA, RECORDS AND SPECIMENS

The remaining test article will be incinerated following completion of all testing with the compound. All original paper data, magnetically encoded records, wet tissues, blocks, slides and the final report will be transferred to the SLI archives and stored for a minimum of ten years. The Sponsor will be consulted prior to final disposition of these materials.

#### VI. RESULTS

##### A. Survival and Clinical Observations

Table 1 (Summary Data)  
Appendix E (Individual Data)

Seven rats died during the study as summarized in the table below.

| Group | Animal No./Sex | Day of Death |
|-------|----------------|--------------|
| 2     | 10335/M        | 44           |
|       | 10390/F        | 70           |
| 3     | 10398/F        | 12           |
|       | 10391/F        | 42           |
|       | 10349/M        | 47           |
|       | 10401/F        | 63           |
|       | 10392/F        | 75           |

Clinical abnormalities in the majority of animals that died were similar to those seen in the surviving animals. The most notable of these involved the respiratory system and included an increased incidence of congested/labored breathing, gasping and rales during both the daily post-dose cage-side observations and the weekly detailed observations for males and females in the high-dose group. Similar findings were noted in the low-dose group but at a significantly lower incidence.

#### B. Body Weights and Weight Gain

Tables 2 and 3 (Summary Data)  
Appendices F and G (Individual Data)

There were no toxicologically meaningful differences noted in mean body weights or body weight gains during the study. Body weight gain was statistically decreased for the high-dose females during days -1 to 8, however, this was not considered toxicologically significant. No other statistical differences in body weights were noted during the study.

#### C. Food Consumption

Table 4 (Summary Data)  
Appendix H (Individual Data)

No toxicologically meaningful differences were noted in food consumption data throughout the study. Food consumption was statistically decreased for the high-dose males during days 85 to 90, however, this was not considered meaningful. No other statistical differences in food consumption were noted during the study.

#### D. Clinical Pathology

Tables 5 and 6 (Summary Data)  
Appendices I and J (Individual Data)  
Appendix K (SLI Clinical Pathology Historical Control Data)

There were no statistically or toxicologically significant differences in hematology data on days 91/92. For biochemistry data, albumin was statistically decreased for the high-dose males on days 91/92, however, this was not considered toxicologically meaningful. There were no other statistically or toxicologically meaningful differences in biochemistry data.

S. Study No. 3188.11 (21)

E. Ophthalmology

Appendix L (Ophthalmology Reports)

No treatment-related ocular findings were observed during ophthalmological examination. All findings were considered typical for this species and strain of rat.

F. Gross Necropsy Observations

Table 7 (Summary Data)

Individual gross necropsy observations are included in the histopathology report in Appendix N.

In animals that died during this study, the most notable internal abnormality occurred in the lungs and generally included mottling and mottling with consolidation. In animals that survived to terminal euthanasia, respiratory abnormalities were again the most prominent observation. As noted above in animals found dead, mottling of the lung was the most notable observation in the high-dose males and females with foci on the lung and thymus observed primarily in the high-dose males.

G. Organ Weights

Tables 8 and 9 (Summary Data)

Appendix M (Individual Data)

At scheduled euthanasia, absolute thymus weights were statistically decreased and relative kidney weights were statistically increased for the high-dose males. No other statistically significant differences in absolute or relative organ weight data were noted.

H. Histopathology

Appendix N (Histopathology Report)

No test article-related lesions were observed in any of the tissues examined from the low- or high-dose groups. All deaths in the study were attributed to inadvertent aspiration of the test article, probably from deposition of a very

small amount of test article in the pharynx when the gavage needle was withdrawn following dosing. Lungs of several rats which died had necrosis of the bronchial epithelium and alveoli as well as edema with inflammatory changes. These changes are consistent with aspiration. Several animals also had necrosis and fibrinous exudate in the trachea as would be expected following aspiration of an irritating substance. One surviving rat, group 3 male #10354, also had severe necrosis of the trachea.

## VII. DISCUSSION

The potential toxicity of NAS administered to rats once daily for three months via the oral (gavage) route of administration was evaluated in this study.

No toxicologically significant effects were noted during this study with regard to body weight/weight gain, food consumption, clinical pathology and organ weights. In addition, with the exception of the abnormalities noted grossly at necropsy and microscopically in the lungs and trachea, all other tissue/organs appeared normal.

There were several notable findings that occurred during this study. A dose-related increase in mortality, clinical abnormalities and gross necropsy findings was observed in several low- and high-dose males and females and was thought to be primarily associated with effects on the respiratory system. Based on the histopathological examination of the lungs and respiratory tree, it is the opinion of the Pathologist and Study Director that these findings were a secondary effect of inadvertent aspiration of the test article following dosing and not a result of systemic pulmonary toxicity. This conclusion is supported by the sporadic nature of the clinical effects and gross necropsy findings observed during the in-life phase of the study as well as the presence of necrosis and fibrinous exudate in the trachea of several animals. In addition, the chemical nature of this compound (i.e., long chain hydrocarbon) is known to be irritating to the respiratory tree and the pulmonary abnormalities observed during this study would be consistent with a chemical pneumonitis.

Although the cause of the aspiration can not be positively determined, it is possible that a small amount of test article was deposited into the trachea as the gavage needle was being withdrawn from the esophagus. In addition, test article may have been forced from the stomach into the trachea by a build up of gas pressure in the stomach/intestinal tract as several animals were noted to be bloated during the study. However, direct pulmonary instillation of the test article during dosing does not appear to be the cause.

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VIII. CONCLUSION

Based on the results of this study, oral administration of NAS did not produce any direct systemic effects in male or female rats at dosage levels up to 200 mg/kg/day. Secondary pulmonary aspiration of the test article appeared to produce adverse effects in several animals. However, these aspiration-related effects were not considered to be a result of test article-induced systemic toxicity.

\_\_\_\_\_  
Rusty E. Rush, M.S., LAT, DABT  
Study Director

Date \_\_\_\_\_

IX. REPORT REVIEW

\_\_\_\_\_  
Todd N. Merriman, B.S., M.B.A., LATG  
Manager of Subchronic Toxicology

Date \_\_\_\_\_

\_\_\_\_\_  
Joseph C. Siglin, Ph.D., DABT  
Vice President, Director of Research

Date \_\_\_\_\_

## X. REFERENCES

1. Snedecor, G. W., and Cochran, W. G., Statistical Methods, Sixth Edition, Iowa State University Press, Ames, Iowa, pp. 258-268, 1967.
2. Dunnett, C. W., J. Am. Sta. Assn., 75:789-795, 1980.

SLI STUDY NO.: 3188.11  
 CLIENT: ECO LAB INC.

TABLE 1  
 90-DAY ORAL TOXICITY STUDY IN RATS  
 SUMMARY OF SURVIVAL AND CLINICAL OBSERVATIONS  
 (OCCURRENCE/ANIMALS AFFECTED)

|                              | ----- M A L E -----           |        |         |          |
|------------------------------|-------------------------------|--------|---------|----------|
|                              | GROUP:<br>LEVEL (MG/KG/DAY) : | 1<br>0 | 2<br>50 | 3<br>200 |
| NORMAL                       |                               |        |         |          |
| -NO CLINICAL SIGNS           | 100/12                        | 129/12 | 122/12  |          |
| DEAD                         |                               |        |         |          |
| -FOUND DEAD                  | 0/ 3                          | 1/ 1   | 1/ 1    |          |
| -SCHEDULED EUTHANASIA        | 12 12                         | 11/11  | 11/11   |          |
| RESPIRATORY                  |                               |        |         |          |
| -CONGESTED BREATHING         | 0/ 0                          | 1/ 1   | 8/ 3    |          |
| -LABORED BREATHING           | 0/ 0                          | 1/ 1   | 5/ 2    |          |
| -RALES                       | 0/ 0                          | 0/ 0   | 7/ 3    |          |
| EXCRETA                      |                               |        |         |          |
| -FEW FECES                   | 0/ 0                          | 1/ 1   | 0/ 0    |          |
| -SOFT STOOLS                 | 2/ 1                          | 0/ 0   | 0/ 0    |          |
| BODY                         |                               |        |         |          |
| -HAIRLOSS                    | 19/ 3                         | 8/ 1   | 10/ 1   |          |
| -URINE STAIN                 | 0/ 0                          | 0/ 0   | 1/ 1    |          |
| -OPEN LESION                 | 0/ 0                          | 0/ 0   | 1/ 1    |          |
| -RED FLUID                   | 0/ 0                          | 0/ 0   | 2/ 2    |          |
| -SWELLING                    | 0/ 0                          | 0/ 0   | 1/ 1    |          |
| -SCAB(S)                     | 2/ 1                          | 0/ 0   | 0/ 0    |          |
| -DARK MATERIAL               | 0/ 0                          | 0/ 0   | 1/ 1    |          |
| EYES                         |                               |        |         |          |
| -DARK MATERIAL AROUND EYE(S) | 4/ 2                          | 1/ 1   | 0/ 0    |          |

NOTE: DATA REFLECT THE TOTAL OCCURRENCE OF EACH CLINICAL FINDING OVER THE NUMBER OF ANIMALS EXHIBITING THE FINDING.

SLI STUDY NO.: 3188.11  
 CLIENT: ECO LAB INC.  
 TABLE 1  
 A 90-DAY ORAL TOXICITY STUDY IN RATS  
 SUMMARY OF SURVIVAL AND CLINICAL OBSERVATIONS  
 (OCCURRENCE/ANIMALS AFFECTED)  
 PAGE 2

|                                 | ----- M A L E -----          |        |         |          |
|---------------------------------|------------------------------|--------|---------|----------|
|                                 | GROUP:<br>LEVEL (MG/KG/DAY): | 1<br>0 | 2<br>50 | 3<br>200 |
| NOSE/MOUTH                      |                              |        |         |          |
| -DARK MATERIAL AROUND NOSE      |                              | 1/1    | 4/2     | 2/2      |
| -DARK MATERIAL AROUND MOUTH     |                              | 0/0    | 0/0     | 1/1      |
| -RED SALIVATION PRIOR TO DOSING |                              | 0/0    | 0/0     | 1/1      |
| -MALALIGNMENT                   |                              | 33/4   | 7/2     | 6/1      |
| -INCISOR(S) -- TRIMMED          |                              | 21/4   | 3/2     | 4/1      |
| -INCISOR(S) -- BROKEN           |                              | 0/0    | 1/1     | 0/0      |
| QUALITY FOOD/WATER              |                              |        |         |          |
| -DECREASED FOOD CONSUMPTION     |                              | 0/0    | 1/1     | 0/0      |
| POST-DOSE                       |                              |        |         |          |
| -CLEAR WET MATING AROUND NOSE   |                              | 0/0    | 0/0     | 3/2      |
| -CLEAR WET MATING AROUND MOUTH  |                              | 0/0    | 0/0     | 2/1      |
| -GASPING                        |                              | 0/0    | 0/0     | 3/2      |
| -LABORED BREATHING              |                              | 0/0    | 1/1     | 16/2     |
| -CONGESTED BREATHING            |                              | 0/0    | 2/1     | 36/3     |
| -DARK MATERIAL                  |                              | 0/0    | 0/0     | 1/1      |
| -RALES                          |                              | 0/0    | 0/0     | 30/3     |
| -COOL TO THE TOUCH              |                              | 0/0    | 1/1     | 1/1      |
| -SALIVATION                     |                              | 0/0    | 0/0     | 2/2      |
| -URINE STAIN                    |                              | 0/0    | 0/0     | 4/2      |
| -SOFT STOOLS                    |                              | 0/0    | 0/0     | 1/1      |
| -FECAL STAIN                    |                              | 0/0    | 0/0     | 1/1      |

NOTE: DATA REFLECT THE TOTAL OCCURRENCE OF EACH CLINICAL FINDING OVER THE NUMBER OF ANIMALS EXHIBITING THE FINDING.

SLI STUDY NO.: 3188.11  
 CLIENT: ECOLAB INC.  
 TABLE 1  
 A 90-DAY ORAL TOXICITY STUDY IN RATS  
 SUMMARY OF SURVIVAL AND CLINICAL OBSERVATIONS  
 (OCCURRENCE/ANIMALS AFFECTED)  
 PAGE 3

|                               | ----- F E M A L E -----      |        |         |          |
|-------------------------------|------------------------------|--------|---------|----------|
|                               | GROUP:<br>LEVEL (MG/KG/DAY): | 1<br>0 | 2<br>50 | 3<br>200 |
| NORMAL                        |                              | 110/12 | 108/12  | 107/11   |
| -NO CLINICAL SIGNS            |                              |        |         |          |
| DEAD                          |                              |        |         |          |
| -FOUND DEAD                   |                              | 0/0    | 1/1     | 4/4      |
| -SCHEDULED EUTHANASTA         |                              | 12/12  | 11/11   | 8/8      |
| RESPIRATORY                   |                              |        |         |          |
| -GASPING                      |                              | 0/0    | 0/0     | 1/1      |
| -CONGESTED BREATHING          |                              | 0/0    | 0/0     | 6/4      |
| -LABORED BREATHING            |                              | 0/0    | 0/0     | 5/2      |
| -RALES                        |                              | 0/0    | 0/0     | 5/3      |
| EXCRETA                       |                              |        |         |          |
| -FECES SMALL IN SIZE          |                              | 0/0    | 0/0     | 2/1      |
| -FEW FECES                    |                              | 0/0    | 0/0     | 2/1      |
| BODY                          |                              |        |         |          |
| -HAIRLOSS                     |                              | 40/4   | 25/4    | 9/1      |
| -URINE STAIN                  |                              | 0/0    | 0/0     | 3/1      |
| -MATTED MATERIAL              |                              | 0/0    | 0/0     | 1/1      |
| -SCAB(S)                      |                              | 0/0    | 0/0     | 1/1      |
| -EXTREMITIES PALE IN COLOR    |                              | 0/0    | 0/0     | 2/1      |
| -ANIMAL APPEARS BLUE IN COLOR |                              | 0/0    | 0/0     | 2/1      |
| -DEHYDRATION                  |                              | 0/0    | 0/0     | 2/1      |
| -ABDOEN APPEARS DISTENDED     |                              | 0/0    | 0/0     | 3/1      |

NOTE: DATA REFLECT THE TOTAL OCCURRENCE OF EACH CLINICAL FINDING OVER THE NUMBER OF ANIMALS EXHIBITING THE FINDING.

SLI STUDY NO.: 3188.11  
 CLIENT: EODLAB INC.

TABLE 1  
 A 90-DAY ORAL TOXICITY STUDY IN RATS  
 SUMMARY OF SURVIVAL AND CLINICAL OBSERVATIONS  
 (OCCURRENCE/ANIMALS AFFECTED)

----- F E M A L E -----

|                                 | GROUP:<br>LEVEL (MG/KG/DAY): | 1<br>0 | 2<br>50 | 3<br>200 |
|---------------------------------|------------------------------|--------|---------|----------|
| TAIL ABNORMALITY                |                              |        |         |          |
| -TAIL SKIN SLOUCHING            |                              | 3/ 1   | 0/ 0    | 0/ 0     |
| EYES                            |                              |        |         |          |
| -DARK MATERIAL AROUND EYE(S)    |                              | 3/ 2   | 7/ 3    | 0/ 0     |
| -EYE(S) DARK IN COLOR           |                              | 0/ 0   | 0/ 0    | 1/ 1     |
| -OCULAR DISCHARGE               |                              | 0/ 0   | 3/ 3    | 0/ 0     |
| NOSE/MOUTH                      |                              |        |         |          |
| -DARK MATERIAL AROUND NOSE      |                              | 0/ 0   | 0/ 0    | 2/ 1     |
| -DARK MATERIAL AROUND MOUTH     |                              | 0/ 0   | 0/ 0    | 1/ 1     |
| -SALIVATION                     |                              | 0/ 0   | 0/ 0    | 1/ 1     |
| -MALALIGNMENT                   |                              | 2/ 1   | 15/ 2   | 0/ 0     |
| -HOLE IN HARD PALATE            |                              | 0/ 0   | 1/ 1    | 0/ 0     |
| -OPEN LESION(S)                 |                              | 0/ 0   | 1/ 1    | 0/ 0     |
| -INCISOR(S) -- TRIMMED          |                              | 3/ 1   | 8/ 2    | 0/ 0     |
| -NASAL DISCHARGE                |                              | 0/ 0   | 4/ 1    | 0/ 0     |
| -APPARENT GROWTH                |                              | 0/ 0   | 0/ 0    | 1/ 1     |
| QUALITY FOOD/WATER              |                              |        |         |          |
| -DECREASED FOOD CONSUMPTION     |                              | 0/ 0   | 0/ 0    | 2/ 1     |
| POSTI-DOSE                      |                              |        |         |          |
| -CLEAR WET MATTING AROUND NOSE  |                              | 0/ 0   | 0/ 0    | 1/ 1     |
| -CLEAR WET MATTING AROUND MOUTH |                              | 0/ 0   | 0/ 0    | 3/ 3     |

NOTE: DATA REFLECT THE TOTAL OCCURRENCE OF EACH CLINICAL FINDING OVER THE NUMBER OF ANIMALS EXHIBITING THE FINDING.

SLI STUDY NO.: 3188.11  
 CLIENT: ECOLAB INC.

TABLE 1  
 A 90-DAY ORAL TOXICITY STUDY IN RATS  
 SUMMARY OF SURVIVAL AND CLINICAL OBSERVATIONS  
 (OCCURRENCE/ANIMALS AFFECTED)

----- F E M A L E -----

|                               | GROUP:             |     |      |
|-------------------------------|--------------------|-----|------|
|                               | 1                  | 2   | 3    |
|                               | LEVEL (MG/KG/DAY): |     |      |
|                               | 0                  | 50  | 200  |
| POST-DOSE                     |                    |     |      |
| -GASPING                      | 0/0                | 0/0 | 6/2  |
| -LABORED BREATHING            | 0/0                | 0/0 | 43/4 |
| -CONGESTED BREATHING          | 0/0                | 0/0 | 44/7 |
| -DARK MATERIAL                | 0/0                | 0/0 | 10/1 |
| -RALES                        | 0/0                | 0/0 | 36/3 |
| -ABDOMEN APPEARS DISTENDED    | 0/0                | 0/0 | 23/2 |
| -COOL TO THE TOUCH            | 0/0                | 0/0 | 1/1  |
| -SALIVATION                   | 0/0                | 0/0 | 1/1  |
| -URINE STAIN                  | 0/0                | 0/0 | 7/2  |
| -EXTREMITIES APPEAR BLUE      | 0/0                | 0/0 | 11/1 |
| -EYE(S) DARK IN COLOR         | 0/0                | 0/0 | 8/1  |
| -ANIMAL APPEARS BLUE IN COLOR | 0/0                | 0/0 | 3/1  |

NOTE: DATA REFLECT THE TOTAL OCCURRENCE OF EACH CLINICAL FINDING OVER THE NUMBER OF ANIMALS EXHIBITING THE FINDING.

SLI STUDY NO.: 3188.11  
 CLIENT: ECOLAB INC.

TABLE 2  
 A 90-DAY ORAL TOXICITY STUDY IN RATS  
 SUMMARY OF BODY WEIGHT DATA (GRAMS)

| DAY    | GROUP:<br>LEVEL (MG/KG/DAY): | M A L E |         |          |
|--------|------------------------------|---------|---------|----------|
|        |                              | 1<br>0  | 2<br>50 | 3<br>200 |
| DAY -1 | MEAN                         | 232     | 232     | 232      |
|        | S.D.                         | 15.9    | 14.1    | 15.0     |
|        | N                            | 12      | 12      | 12       |
| DAY 8  | MEAN                         | 293     | 291     | 287      |
|        | S.D.                         | 23.4    | 20.0    | 16.2     |
|        | N                            | 12      | 12      | 12       |
| DAY 15 | MEAN                         | 341     | 338     | 333      |
|        | S.D.                         | 28.0    | 24.0    | 19.6     |
|        | N                            | 12      | 12      | 12       |
| DAY 22 | MEAN                         | 383     | 381     | 377      |
|        | S.D.                         | 32.9    | 26.7    | 22.7     |
|        | N                            | 12      | 12      | 12       |
| DAY 29 | MEAN                         | 411     | 410     | 404      |
|        | S.D.                         | 35.7    | 30.7    | 24.7     |
|        | N                            | 12      | 12      | 12       |
| DAY 36 | MEAN                         | 441     | 439     | 431      |
|        | S.D.                         | 42.2    | 34.3    | 27.5     |
|        | N                            | 12      | 12      | 12       |
| DAY 43 | MEAN                         | 465     | 456     | 455      |
|        | S.D.                         | 46.1    | 45.1    | 32.6     |
|        | N                            | 12      | 12      | 12       |

NONE SIGNIFICANTLY DIFFERENT FROM CONTROL

TABLE 2  
A 90-DAY ORAL TOXICITY STUDY IN RATS  
SUMMARY OF BODY WEIGHT DATA (GRAMS)

SLI STUDY NO.: 3188.11  
CLIENT: ECOLAB INC.

----- M A L E -----

| DAY | GROUP:<br>LEVEL (MG/KG/DAY): | M A L E |         |          |
|-----|------------------------------|---------|---------|----------|
|     |                              | 1<br>0  | 2<br>50 | 3<br>200 |
| 50  | MEAN                         | 483     | 483     | 470      |
|     | S.D.                         | 51.7    | 37.5    | 34.7     |
|     | N                            | 12      | 11      | 11       |
| 57  | MEAN                         | 496     | 499     | 486      |
|     | S.D.                         | 52.3    | 39.5    | 39.9     |
|     | N                            | 12      | 11      | 11       |
| 64  | MEAN                         | 513     | 512     | 500      |
|     | S.D.                         | 56.4    | 40.9    | 45.2     |
|     | N                            | 12      | 11      | 11       |
| 71  | MEAN                         | 527     | 522     | 511      |
|     | S.D.                         | 60.6    | 41.5    | 47.9     |
|     | N                            | 12      | 11      | 11       |
| 78  | MEAN                         | 543     | 535     | 514      |
|     | S.D.                         | 60.7    | 42.8    | 61.2     |
|     | N                            | 12      | 11      | 11       |
| 85  | MEAN                         | 546     | 540     | 516      |
|     | S.D.                         | 59.0    | 43.4    | 60.6     |
|     | N                            | 12      | 11      | 11       |
| 90  | MEAN                         | 558     | 553     | 518      |
|     | S.D.                         | 61.5    | 43.6    | 61.1     |
|     | N                            | 12      | 11      | 11       |

----- NONE SIGNIFICANTLY DIFFERENT FROM CONTROL -----

SLI STUDY NO.: 3188.11  
 CLIENT: ECOLAB INC.  
 TABLE 2  
 A 90-DAY ORAL TOXICITY STUDY IN RATS  
 SUMMARY OF BODY WEIGHT DATA (GRAMS)  
 PAGE 3

----- F E M A L E -----

| DAY    | GROUP:<br>LEVEL (MG/KG/DAY): | F E M A L E |         |          |
|--------|------------------------------|-------------|---------|----------|
|        |                              | 1<br>0      | 2<br>50 | 3<br>200 |
| DAY -1 | MEAN                         | 170         | 170     | 168      |
|        | S.D.                         | 10.7        | 10.1    | 9.9      |
|        | N                            | 12          | 12      | 12       |
| DAY 8  | MEAN                         | 199         | 193     | 188      |
|        | S.D.                         | 14.1        | 14.7    | 19.2     |
|        | N                            | 12          | 12      | 12       |
| DAY 15 | MEAN                         | 220         | 217     | 212      |
|        | S.D.                         | 17.2        | 15.1    | 19.9     |
|        | N                            | 12          | 12      | 11       |
| DAY 22 | MEAN                         | 242         | 236     | 230      |
|        | S.D.                         | 19.8        | 19.3    | 15.9     |
|        | N                            | 12          | 12      | 11       |
| DAY 29 | MEAN                         | 250         | 241     | 242      |
|        | S.D.                         | 21.4        | 19.1    | 18.3     |
|        | N                            | 12          | 12      | 11       |
| DAY 36 | MEAN                         | 259         | 253     | 250      |
|        | S.D.                         | 19.8        | 20.9    | 31.7     |
|        | N                            | 12          | 12      | 11       |
| DAY 43 | MEAN                         | 267         | 262     | 251      |
|        | S.D.                         | 23.1        | 19.9    | 38.3     |
|        | N                            | 12          | 12      | 10       |

NONE SIGNIFICANTLY DIFFERENT FROM CONTROL

SLI STUDY NO.: 3188.11  
 CLIENT: ECOLAB INC.

TABLE 2  
 A 90-DAY ORAL TOXICITY STUDY IN RATS  
 SUMMARY OF BODY WEIGHT DATA (GRAMS)

----- F E M A L E -----

| DAY | GROUP:<br>LEVEL (MG/KG/DAY): | 1    |      | 2    |      | 3    |      |
|-----|------------------------------|------|------|------|------|------|------|
|     |                              | 0    | 274  | 50   | 269  | 200  | 258  |
| 50  | MEAN                         | 23.6 | 20.1 | 27.2 | 26.9 | 33.9 | 33.9 |
|     | S.D.                         | 12   | 12   | 12   | 12   | 10   | 10   |
|     | N                            |      |      |      |      |      |      |
| 57  | MEAN                         | 27.8 | 24.1 | 27.2 | 27.2 | 26.7 | 26.7 |
|     | S.D.                         | 12   | 12   | 12   | 12   | 25.6 | 25.6 |
|     | N                            |      |      |      |      | 10   | 10   |
| 64  | MEAN                         | 28.2 | 27.3 | 27.8 | 27.8 | 28.1 | 28.1 |
|     | S.D.                         | 12   | 12   | 12   | 12   | 18.0 | 18.0 |
|     | N                            |      |      |      |      | 9    | 9    |
| 71  | MEAN                         | 28.6 | 27.1 | 28.3 | 28.3 | 28.2 | 28.2 |
|     | S.D.                         | 12   | 12   | 11   | 11   | 17.9 | 17.9 |
|     | N                            |      |      |      |      | 9    | 9    |
| 78  | MEAN                         | 29.4 | 28.0 | 28.9 | 28.9 | 28.4 | 28.4 |
|     | S.D.                         | 12   | 12   | 11   | 11   | 16.7 | 16.7 |
|     | N                            |      |      |      |      | 8    | 8    |
| 85  | MEAN                         | 29.5 | 29.6 | 28.7 | 28.7 | 28.0 | 28.0 |
|     | S.D.                         | 12   | 12   | 11   | 11   | 19.1 | 19.1 |
|     | N                            |      |      |      |      | 8    | 8    |
| 90  | MEAN                         | 29.9 | 29.2 | 29.2 | 29.2 | 28.2 | 28.2 |
|     | S.D.                         | 12   | 12   | 11   | 11   | 19.4 | 19.4 |
|     | N                            |      |      |      |      | 8    | 8    |

NONE SIGNIFICANTLY DIFFERENT FROM CONTROL

SLI STUDY NO.: 3188.11  
 CLIENT: ECOLAB INC.

TABLE 3  
 A 90-DAY ORAL TOXICITY STUDY IN RATS  
 SUMMARY OF BODY WEIGHT GAIN DATA (GRAMS)

----- M A L E -----

| DAY          | GROUP:<br>LEVEL (MG/KG/DAY): | M A L E |         |          |
|--------------|------------------------------|---------|---------|----------|
|              |                              | 1<br>0  | 2<br>50 | 3<br>200 |
| DAY -1 TO 8  | MEAN                         | 61      | 59      | 55       |
|              | S.D.                         | 10.2    | 7.3     | 6.0      |
|              | N                            | 12      | 12      | 12       |
| DAY 8 TO 15  | MEAN                         | 48      | 48      | 46       |
|              | S.D.                         | 5.9     | 7.4     | 8.9      |
|              | N                            | 12      | 12      | 12       |
| DAY 15 TO 22 | MEAN                         | 43      | 43      | 44       |
|              | S.D.                         | 5.9     | 7.1     | 5.1      |
|              | N                            | 12      | 12      | 12       |
| DAY 22 TO 29 | MEAN                         | 28      | 29      | 27       |
|              | S.D.                         | 6.8     | 5.6     | 5.1      |
|              | N                            | 12      | 12      | 12       |
| DAY 29 TO 36 | MEAN                         | 29      | 28      | 26       |
|              | S.D.                         | 8.3     | 5.2     | 7.3      |
|              | N                            | 12      | 12      | 12       |
| DAY 36 TO 43 | MEAN                         | 24      | 17      | 25       |
|              | S.D.                         | 5.6     | 19.4    | 7.9      |
|              | N                            | 12      | 12      | 12       |
| DAY 43 TO 50 | MEAN                         | 18      | 19      | 14       |
|              | S.D.                         | 6.6     | 5.2     | 7.0      |
|              | N                            | 12      | 11      | 11       |

NONE SIGNIFICANTLY DIFFERENT FROM CONTROL

SLI STUDY NO.: 3188.11  
 CLIENT: ECOLAB INC.

TABLE 3  
 A 90-DAY ORAL TOXICITY STUDY IN RATS  
 SUMMARY OF BODY WEIGHT GAIN DATA (GRAMS)

| DAY      | GROUP:             | M A L E |         |          |
|----------|--------------------|---------|---------|----------|
|          |                    | 1<br>0  | 2<br>50 | 3<br>200 |
| 50 TO 57 | LEVEL (MG/KG/DAY): | 13      | 16      | 16       |
|          | MEAN               | 6.3     | 5.1     | 6.4      |
|          | S.D.<br>N          | 12      | 11      | 11       |
| 57 TO 64 | MEAN               | 17      | 13      | 14       |
|          | S.D.               | 6.5     | 5.1     | 10.1     |
|          | N                  | 12      | 11      | 11       |
| 64 TO 71 | MEAN               | 14      | 11      | 11       |
|          | S.D.               | 6.8     | 3.7     | 6.5      |
|          | N                  | 12      | 11      | 11       |
| 71 TO 78 | MEAN               | 16      | 13      | 4        |
|          | S.D.               | 5.3     | 4.6     | 33.5     |
|          | N                  | 12      | 11      | 11       |
| 78 TO 85 | MEAN               | 3       | 5       | 2        |
|          | S.D.               | 6.6     | 7.0     | 8.1      |
|          | N                  | 12      | 11      | 11       |
| 85 TO 90 | MEAN               | 12      | 13      | 2        |
|          | S.D.               | 6.0     | 3.8     | 16.0     |
|          | N                  | 12      | 11      | 11       |

NONE SIGNIFICANTLY DIFFERENT FROM CONTROL

SLI STUDY NO.: 3188.11  
 CLIENT: ECOLAB INC.

TABLE 3  
 A 90-DAY ORAL TOXICITY STUDY IN RATS  
 SUMMARY OF BODY WEIGHT GAIN DATA (GRAMS)

PAGE 3

----- FEMALE -----

| DAY      | GROUP: | LEVEL (MG/KG/DAY): |     |      |
|----------|--------|--------------------|-----|------|
|          |        | 1                  | 2   | 3    |
|          |        | 0                  | 50  | 200  |
| -1 TO 8  | MEAN   | 29                 | 23  | 20*  |
|          | S.D.   | 4.8                | 7.5 | 13.0 |
|          | N      | 12                 | 12  | 12   |
| 8 TO 15  | MEAN   | 21                 | 24  | 21   |
|          | S.D.   | 5.8                | 9.2 | 4.9  |
|          | N      | 12                 | 12  | 11   |
| 15 TO 22 | MEAN   | 22                 | 19  | 18   |
|          | S.D.   | 5.3                | 7.1 | 6.3  |
|          | N      | 12                 | 12  | 11   |
| 22 TO 29 | MEAN   | 8                  | 5   | 11   |
|          | S.D.   | 4.0                | 4.6 | 5.8  |
|          | N      | 12                 | 12  | 11   |
| 29 TO 36 | MEAN   | 10                 | 12  | 9    |
|          | S.D.   | 4.3                | 3.9 | 18.1 |
|          | N      | 12                 | 12  | 11   |
| 36 TO 43 | MEAN   | 8                  | 9   | 5    |
|          | S.D.   | 6.4                | 6.2 | 9.1  |
|          | N      | 12                 | 12  | 10   |
| 43 TO 50 | MEAN   | 7                  | 7   | 7    |
|          | S.D.   | 6.9                | 5.5 | 8.1  |
|          | N      | 12                 | 12  | 10   |

SIGNIFICANTLY DIFFERENT FROM CONTROL: \* = P<0.05

SLI STUDY NO.: 3188.11  
 CLIENT: ECOLAB INC.

TABLE 3  
 A 90-DAY ORAL TOXICITY STUDY IN RATS  
 SUMMARY OF BODY WEIGHT GAIN DATA (GRAMS)

PAGE 4

----- F E M A L E -----

| DAY      | GROUP:<br>LEVEL (MG/KG/DAY): | 1   |     | 2    |      | 3   |   |
|----------|------------------------------|-----|-----|------|------|-----|---|
|          |                              | 0   | 4   | 50   | 3    | 200 | 9 |
| 50 TO 57 | MEAN                         |     | 4.6 | 4.7  | 10.7 |     |   |
|          | S.D.                         |     | 12  | 12   | 10   |     |   |
|          | N                            |     | 12  | 12   | 10   |     |   |
| 57 TO 64 | MEAN                         | 4   | 4   | 6    | 7    |     |   |
|          | S.D.                         | 4.8 | 4.8 | 6.6  | 3.6  |     |   |
|          | N                            | 12  | 12  | 12   | 9    |     |   |
| 64 TO 71 | MEAN                         | 4   | 4   | 5    | 2    |     |   |
|          | S.D.                         | 4.7 | 4.7 | 4.7  | 4.3  |     |   |
|          | N                            | 12  | 12  | 11   | 9    |     |   |
| 71 TO 78 | MEAN                         | 7   | 7   | 6    | 4    |     |   |
|          | S.D.                         | 4.6 | 4.6 | 3.1  | 3.8  |     |   |
|          | N                            | 12  | 12  | 11   | 8    |     |   |
| 78 TO 85 | MEAN                         | 1   | 1   | -2   | -4   |     |   |
|          | S.D.                         | 5.1 | 5.1 | 14.2 | 12.4 |     |   |
|          | N                            | 12  | 12  | 11   | 8    |     |   |
| 85 TO 90 | MEAN                         | 5   | 5   | 6    | 3    |     |   |
|          | S.D.                         | 3.2 | 3.2 | 8.0  | 4.4  |     |   |
|          | N                            | 12  | 12  | 11   | 8    |     |   |

NONE SIGNIFICANTLY DIFFERENT FROM CONTROL

SF-1 STUDY NO.: 3188.11  
 CLIENT: ECOLAB INC.

TABLE 4  
 A 90-DAY ORAL TOXICITY STUDY IN RATS  
 SUMMARY OF FOOD CONSUMPTION DATA (GRAMS/ANIMAL/DAY)

PAGE 1

| DAY          | GROUP: | LEVEL (MG/KG/DAY): |     |     | ----- M A L E ----- |     |     |
|--------------|--------|--------------------|-----|-----|---------------------|-----|-----|
|              |        | 1                  | 2   | 3   | 1                   | 2   | 3   |
| -1 TO 8      | 0      | 27                 | 26  | 200 | 26                  | 50  | 200 |
|              | MEAN   | 1.6                | 2.1 | 2.3 | 2.1                 | 2.1 | 2.3 |
|              | S.D.   | 12                 | 12  | 12  | 12                  | 12  | 12  |
|              | N      |                    |     |     |                     |     |     |
| DAY 8 TO 15  | MEAN   | 28                 | 27  | 28  | 27                  | 27  | 28  |
|              | S.D.   | 1.7                | 2.1 | 2.6 | 2.1                 | 2.1 | 2.6 |
|              | N      | 12                 | 12  | 11  | 12                  | 12  | 11  |
| DAY 15 TO 22 | MEAN   | 29                 | 28  | 28  | 28                  | 28  | 28  |
|              | S.D.   | 1.0                | 2.0 | 2.4 | 2.0                 | 2.0 | 2.4 |
|              | N      | 12                 | 11  | 11  | 11                  | 11  | 11  |
| DAY 22 TO 29 | MEAN   | 29                 | 29  | 29  | 29                  | 29  | 29  |
|              | S.D.   | 1.2                | 2.2 | 2.5 | 2.2                 | 2.2 | 2.5 |
|              | N      | 12                 | 12  | 12  | 12                  | 12  | 12  |
| DAY 29 TO 36 | MEAN   | 29                 | 29  | 29  | 29                  | 29  | 29  |
|              | S.D.   | 1.9                | 2.0 | 2.5 | 2.0                 | 2.0 | 2.5 |
|              | N      | 12                 | 12  | 12  | 12                  | 12  | 12  |
| DAY 36 TO 43 | MEAN   | 30                 | 28  | 30  | 28                  | 28  | 30  |
|              | S.D.   | 1.1                | 4.4 | 3.4 | 4.4                 | 4.4 | 3.4 |
|              | N      | 11                 | 11  | 12  | 11                  | 11  | 12  |
| DAY 43 TO 50 | MEAN   | 29                 | 29  | 29  | 29                  | 29  | 29  |
|              | S.D.   | 1.7                | 1.8 | 3.0 | 1.8                 | 1.8 | 3.0 |
|              | N      | 10                 | 11  | 10  | 11                  | 11  | 10  |

NONE SIGNIFICANTLY DIFFERENT FROM CONTROL.

SLI STUDY NO.: 3188.11  
 CLIENT: ECOLAB INC.  
 TABLE 4  
 A 90-DAY ORAL TOXICITY STUDY IN RATS  
 SUMMARY OF FOOD CONSUMPTION DATA (GRAMS/ANIMAL/DAY)  
 PAGE 2

| DAY      | GROUP:             | ----- M A L E ----- |     |     |
|----------|--------------------|---------------------|-----|-----|
|          |                    | 1                   | 2   | 3   |
|          | LEVEL (MG/KG/DAY): | 0                   | 50  | 200 |
| 50 TO 57 | MEAN               | 29                  | 28  | 29  |
|          | S.D.               | 1.6                 | 1.6 | 3.4 |
|          | N                  | 11                  | 11  | 10  |
| 57 TO 64 | MEAN               | 29                  | 28  | 28  |
|          | S.D.               | 2.0                 | 2.3 | 3.6 |
|          | N                  | 12                  | 11  | 11  |
| 64 TO 71 | MEAN               | 29                  | 28  | 28  |
|          | S.D.               | 1.6                 | 2.0 | 3.0 |
|          | N                  | 12                  | 11  | 11  |
| 71 TO 78 | MEAN               | 28                  | 28  | 26  |
|          | S.D.               | 1.7                 | 1.7 | 6.2 |
|          | N                  | 12                  | 11  | 11  |
| 78 TO 85 | MEAN               | 27                  | 27  | 26  |
|          | S.D.               | 1.4                 | 1.8 | 4.5 |
|          | N                  | 11                  | 11  | 11  |
| 85 TO 90 | MEAN               | 28                  | 27  | 25* |
|          | S.D.               | 2.0                 | 1.8 | 3.1 |
|          | N                  | 12                  | 11  | 11  |

SIGNIFICANTLY DIFFERENT FROM CONTROL: \* = P<0.05

SLI STUDY NO.: 3188.11  
 CLIENT: ECOLAB INC.  
 TABLE 4  
 A 90-DAY ORAL TOXICITY STUDY IN RATS  
 SUMMARY OF FOOD CONSUMPTION DATA (GRAMS/ANIMAL/DAY)  
 PAGE 3

----- FEMALE -----

| DAY          | GROUP: | LEVEL (MG/KG/DAY): |     |     |
|--------------|--------|--------------------|-----|-----|
|              |        | 1                  | 2   | 3   |
|              |        | 0                  | 50  | 200 |
| DAY -1 TO 8  | MEAN   | 19                 | 19  | 18  |
|              | S.D.   | 1.5                | 1.7 | 2.5 |
|              | N      | 12                 | 12  | 12  |
| DAY 8 TO 15  | MEAN   | 19                 | 20  | 19  |
|              | S.D.   | 1.6                | 2.6 | 2.2 |
|              | N      | 12                 | 11  | 10  |
| DAY 15 TO 22 | MEAN   | 20                 | 20  | 20  |
|              | S.D.   | 1.7                | 2.2 | 1.1 |
|              | N      | 11                 | 10  | 11  |
| DAY 22 TO 29 | MEAN   | 20                 | 19  | 21  |
|              | S.D.   | 1.7                | 2.1 | 1.6 |
|              | N      | 10                 | 10  | 11  |
| DAY 29 TO 36 | MEAN   | 20                 | 20  | 19  |
|              | S.D.   | 1.5                | 2.1 | 4.1 |
|              | N      | 12                 | 12  | 11  |
| DAY 36 TO 43 | MEAN   | 20                 | 20  | 20  |
|              | S.D.   | 2.2                | 1.4 | 3.5 |
|              | N      | 9                  | 10  | 9   |
| DAY 43 TO 50 | MEAN   | 20                 | 20  | 19  |
|              | S.D.   | 2.7                | 2.1 | 2.3 |
|              | N      | 10                 | 12  | 10  |

NONE SIGNIFICANTLY DIFFERENT FROM CONTROL

TABLE 4  
A 90-DAY ORAL TOXICITY STUDY IN RATS  
SUMMARY OF FOOD CONSUMPTION DATA (GRAMS/ANIMAL/DAY)

SUI STUDY NO.: 3188.11  
CLIENT: ECOLAB INC.

----- F E M A L E -----

| DAY      | GROUP: | LEVEL (MG/KG/DAY): |     |     |
|----------|--------|--------------------|-----|-----|
|          |        | 1                  | 2   | 3   |
| 50 TO 57 | MEAN   | 19                 | 19  | 20  |
|          | S.D.   | 2.6                | 1.8 | 1.7 |
|          | N      | 11                 | 12  | 10  |
| 57 TO 64 | MEAN   | 19                 | 19  | 20  |
|          | S.D.   | 2.5                | 2.1 | 1.6 |
|          | N      | 12                 | 10  | 8   |
| 64 TO 71 | MEAN   | 19                 | 19  | 19  |
|          | S.D.   | 2.3                | 2.1 | 1.4 |
|          | N      | 12                 | 11  | 9   |
| 71 TO 78 | MEAN   | 18                 | 19  | 19  |
|          | S.D.   | 1.4                | 1.7 | 1.2 |
|          | N      | 11                 | 11  | 8   |
| 78 TO 85 | MEAN   | 18                 | 18  | 17  |
|          | S.D.   | 2.0                | 3.2 | 3.4 |
|          | N      | 12                 | 11  | 8   |
| 85 TO 90 | MEAN   | 18                 | 17  | 18  |
|          | S.D.   | 2.0                | 2.2 | 2.5 |
|          | N      | 12                 | 11  | 8   |

NONE SIGNIFICANTLY DIFFERENT FROM CONTROL.

SLI STUDY NO.: 3188.11  
 CLIENT: ECOOLAB INC.  
 TABLE 5  
 A 90-DAY ORAL TOXICITY STUDY IN RATS  
 SUMMARY OF HEMATOLOGY DATA  
 PAGE 1

|                              | GROUP:<br>LEVEL (MG/KG/DAY):              | M A L E             |                     |                     |
|------------------------------|---|---------------------|---------------------|---------------------|
|                              |   | 1<br>0              | 2<br>50             | 3<br>200            |
| ERYTHROCYTES<br>DAY 91/92    | 10*6/CM <sup>3</sup><br>MEAN<br>S.D.<br>N | 8.77<br>0.290<br>12 | 8.55<br>0.339<br>11 | 8.77<br>0.550<br>10 |
| HEMOGLOBIN<br>DAY 91/92      | G/DL<br>MEAN<br>S.D.<br>N                 | 15.7<br>0.52<br>12  | 15.4<br>0.37<br>11  | 15.8<br>0.90<br>10  |
| HEMATOCRIT<br>DAY 91/92      | %<br>MEAN<br>S.D.<br>N                    | 45.9<br>1.82<br>12  | 45.1<br>1.65<br>11  | 46.6<br>2.95<br>10  |
| MEAN CORPUS VOL<br>DAY 91/92 | FL<br>MEAN<br>S.D.<br>N                   | 52.4<br>0.86<br>12  | 52.8<br>2.09<br>11  | 53.2<br>1.79<br>10  |
| MCH<br>DAY 91/92             | PG<br>MEAN<br>S.D.<br>N                   | 17.9<br>0.36<br>12  | 18.0<br>0.70<br>11  | 18.0<br>0.77<br>10  |
| MCHC<br>DAY 91/92            | G/DL<br>MEAN<br>S.D.<br>N                 | 34.1<br>0.51<br>12  | 34.1<br>1.05<br>11  | 33.9<br>0.55<br>10  |

NONE SIGNIFICANTLY DIFFERENT FROM CONTROL  
 NOTE: THE MEANS AND STANDARD DEVIATIONS WERE CALCULATED USING NONROUNDED VALUES.

SLI STUDY NO.: 3188.11  
 CLIENT: ECOLAB INC.

TABLE 5  
 A 90-DAY ORAL TOXICITY STUDY IN RATS  
 SUMMARY OF HEMATOLOGY DATA

|                     |                                  | ----- M A L E ----- |       |       |
|---------------------|----------------------------------|---------------------|-------|-------|
|                     |                                  | 1                   | 2     | 3     |
| GROUP:              |                                  | 0                   | 50    | 200   |
| LEVEL (MG/KG/DAY):  |                                  |                     |       |       |
| PLATELETS           | 10 <sup>3</sup> /CM <sup>3</sup> |                     |       |       |
| DAY                 | 91/92                            | 1126                | 1141  | 1029  |
|                     |                                  | 107.2               | 94.7  | 131.9 |
|                     |                                  | 12                  | 11    | 10    |
| NUCLEATED RBC'S     | #/100RBC                         |                     |       |       |
| DAY                 | 91/92                            | 0                   | 0     | 0     |
|                     |                                  | 0.0                 | 0.0   | 0.0   |
|                     |                                  | 12                  | 11    | 10    |
| RED CELL MORPHOLOGY |                                  |                     |       |       |
| DAY                 | 91/92                            | NORMAL              | 12/12 | 11/11 |
|                     |                                  |                     |       | 10/10 |

NONE SIGNIFICANTLY DIFFERENT FROM CONTROL

NOTE: THE MEANS AND STANDARD DEVIATIONS WERE CALCULATED USING UNROUNDED VALUES.

SLI STUDY NO.: 3188-11  
 CLIENT: ECOLAB INC.

TABLE 5  
 A 90-DAY ORAL TOXICITY STUDY IN RATS  
 SUMMARY OF HEMATOLOGY DATA

|                    |          | M A L E |      |      |
|--------------------|----------|---------|------|------|
| GROUP:             |          | 1       | 2    | 3    |
| LEVEL (MG/KG/DAY): |          | 0       | 50   | 200  |
| LEUKOCYTES         | 10*3/CMH |         |      |      |
| DAY 91/92          | MEAN     | 12.0    | 12.3 | 9.8  |
|                    | S.D.     | 2.69    | 1.93 | 3.90 |
|                    | N        | 12      | 11   | 10   |
| SEED NEUTROPHILS   | 10*3/CMH |         |      |      |
| DAY 91/92          | MEAN     | 1.1     | 1.2  | 1.4  |
|                    | S.D.     | 0.32    | 0.71 | 0.58 |
|                    | N        | 12      | 11   | 10   |
| NON-SEED NEUTRO.   | 10*3/CMH |         |      |      |
| DAY 91/92          | MEAN     | 0.0     | 0.0  | 0.0  |
|                    | S.D.     | 0.00    | 0.00 | 0.00 |
|                    | N        | 12      | 11   | 10   |
| LYMPHOCYTES        | 10*3/CMH |         |      |      |
| DAY 91/92          | MEAN     | 10.8    | 10.8 | 8.4  |
|                    | S.D.     | 2.75    | 1.73 | 3.66 |
|                    | N        | 12      | 11   | 10   |
| MONOCYTES          | 10*3/CMH |         |      |      |
| DAY 91/92          | MEAN     | 0.1     | 0.2  | 0.0  |
|                    | S.D.     | 0.10    | 0.16 | 0.05 |
|                    | N        | 12      | 11   | 10   |
| BASOPHILS          | 10*3/CMH |         |      |      |
| DAY 91/92          | MEAN     | 0.0     | 0.0  | 0.0  |
|                    | S.D.     | 0.00    | 0.00 | 0.00 |
|                    | N        | 12      | 11   | 10   |

NONE SIGNIFICANTLY DIFFERENT FROM CONTROL  
 NOTE: THE MEANS AND STANDARD DEVIATIONS WERE CALCULATED USING NONROUNDED VALUES.

SLI STUDY NO.: 3188.11  
CLIENT: ECOLAB INC.

TABLE 5  
A 90-DAY ORAL TOXICITY STUDY IN RATS  
SUMMARY OF HEMATOLOGY DATA

PAGE 4

|                    |          | ----- M A L E ----- |      |      |
|--------------------|----------|---------------------|------|------|
| GROUP:             |          | 1                   | 2    | 3    |
| LEVEL (MG/KG/DAY): |          | 0                   | 50   | 200  |
| EOSINOPHILS        | 10x3/CMH |                     |      |      |
| DAY                | 91/92    |                     |      |      |
|                    | MEAN     | 0.1                 | 0.1  | 0.1  |
|                    | S.D.     | 0.12                | 0.13 | 0.11 |
|                    | N        | 12                  | 11   | 10   |

NONE SIGNIFICANTLY DIFFERENT FROM CONTROL

NOTE: THE MEANS AND STANDARD DEVIATIONS WERE CALCULATED USING NONROUNDED VALUES.

TABLE 5  
A 90-DAY ORAL TOXICITY STUDY IN RATS  
SUMMARY OF HEMATOLOGY DATA

SLI STUDY NO.: 3188.11  
CLIENT: ECOLAB INC.

----- FEMALE -----

|                              | GROUP:   | LEVEL (MG/KG/DAY): |       |       |
|------------------------------|----------|--------------------|-------|-------|
|                              |          | 1                  | 2     | 3     |
|                              |          | 0                  | 50    | 200   |
| ERYTHROCYTES<br>DAY 91/92    | 10x6/CMF |                    |       |       |
|                              | MEAN     | 7.81               | 7.85  | 8.24  |
|                              | S.D.     | 0.396              | 0.505 | 0.378 |
|                              | N        | 12                 | 11    | 8     |
| HEMOGLOBIN<br>DAY 91/92      | G/DL     |                    |       |       |
|                              | MEAN     | 15.0               | 15.3  | 15.5  |
|                              | S.D.     | 0.64               | 0.75  | 0.69  |
|                              | N        | 12                 | 11    | 8     |
| HEMATOCRIT<br>DAY 91/92      | %        |                    |       |       |
|                              | MEAN     | 42.9               | 43.6  | 44.3  |
|                              | S.D.     | 2.12               | 2.53  | 2.01  |
|                              | N        | 12                 | 11    | 8     |
| MEAN CORPUS VOL<br>DAY 91/92 | FL       |                    |       |       |
|                              | MEAN     | 55.0               | 55.5  | 53.8  |
|                              | S.D.     | 2.17               | 2.14  | 1.99  |
|                              | N        | 12                 | 11    | 8     |
| MCH<br>DAY 91/92             | PG       |                    |       |       |
|                              | MEAN     | 19.2               | 19.5  | 18.8  |
|                              | S.D.     | 0.71               | 0.54  | 0.86  |
|                              | N        | 12                 | 11    | 8     |
| MCHC<br>DAY 91/92            | G/DL     |                    |       |       |
|                              | MEAN     | 35.0               | 35.2  | 35.0  |
|                              | S.D.     | 0.88               | 0.84  | 0.86  |
|                              | N        | 12                 | 11    | 8     |

NONE SIGNIFICANTLY DIFFERENT FROM CONTROL  
NOTE: THE MEANS AND STANDARD DEVIATIONS WERE CALCULATED USING NONROUNDED VALUES.

SLI STUDY NO.: 3188.11  
 CLIENT: ECOLAB INC.

TABLE 5  
 A 90-DAY ORAL TOXICITY STUDY IN RATS  
 SUMMARY OF HEMATOLOGY DATA

PAGE 6

----- F E M A L E -----

| GROUP:                   | LEVEL (MG/KG/DAY): |       |      |
|--------------------------|--------------------|-------|------|
|                          | 1                  | 2     | 3    |
| PLATELETS                | 0                  | 50    | 200  |
| DAY 91/92                |                    |       |      |
| MEAN                     | 1098               | 1125  | 1060 |
| S.D.                     | 146.2              | 279.9 | 95.8 |
| N                        | 12                 | 11    | 8    |
| NUCLEATED RBC'S #/100WBC |                    |       |      |
| DAY 91/92                |                    |       |      |
| MEAN                     | 0                  | 0     | 0    |
| S.D.                     | 0.0                | 0.0   | 0.0  |
| N                        | 12                 | 11    | 8    |
| RED CELL MORPHOLOGY      |                    |       |      |
| DAY 91/92                |                    |       |      |
| NORMAL                   | 12/12              | 11/11 | 8/8  |

NONE SIGNIFICANTLY DIFFERENT FROM CONTROL

NOTE: THE MEANS AND STANDARD DEVIATIONS WERE CALCULATED USING NONROUNDED VALUES.

SLI STUDY NO.: 3188.11  
 CLIENT: ECOLAB INC.

TABLE 5  
 A 90-DAY ORAL TOXICITY STUDY IN RATS  
 SUMMARY OF HEMATOLOGY DATA

PAGE 7

----- FEMALE -----

| GROUP:                        |                      | 1    | 2    | 3    |
|-------------------------------|----------------------|------|------|------|
| LEVEL (MG/KG/DAY):            |                      | 0    | 50   | 200  |
| LEUKOCYTES<br>DAY 91/92       | 10*3/CM <sup>3</sup> |      |      |      |
|                               | MEAN                 | 8.2  | 10.0 | 8.4  |
|                               | S.D.                 | 2.21 | 5.12 | 1.62 |
|                               | N                    | 12   | 11   | 8    |
| SEED NEUTROPHILS<br>DAY 91/92 | 10*3/CM <sup>3</sup> |      |      |      |
|                               | MEAN                 | 0.6  | 2.2  | 0.7  |
|                               | S.D.                 | 0.35 | 3.48 | 0.30 |
|                               | N                    | 12   | 11   | 8    |
| NON-SEED NEUTRO.<br>DAY 91/92 | 10*3/CM <sup>3</sup> |      |      |      |
|                               | MEAN                 | 0.0  | 0.0  | 0.0  |
|                               | S.D.                 | 0.00 | 0.00 | 0.00 |
|                               | N                    | 12   | 11   | 8    |
| LYMPHOCYTES<br>DAY 91/92      | 10*3/CM <sup>3</sup> |      |      |      |
|                               | MEAN                 | 7.4  | 7.6  | 7.5  |
|                               | S.D.                 | 2.20 | 2.03 | 1.45 |
|                               | N                    | 12   | 11   | 8    |
| MONOCYTES<br>DAY 91/92        | 10*3/CM <sup>3</sup> |      |      |      |
|                               | MEAN                 | 0.1  | 0.1  | 0.1  |
|                               | S.D.                 | 0.06 | 0.21 | 0.08 |
|                               | N                    | 12   | 11   | 8    |
| BASOPHILS<br>DAY 91/92        | 10*3/CM <sup>3</sup> |      |      |      |
|                               | MEAN                 | 0.0  | 0.0  | 0.0  |
|                               | S.D.                 | 0.00 | 0.00 | 0.00 |
|                               | N                    | 12   | 11   | 8    |

NONE SIGNIFICANTLY DIFFERENT FROM CONTROL  
 NOTE: THE MEANS AND STANDARD DEVIATIONS WERE CALCULATED USING NONROUNDED VALUES.

SLI STUDY NO.: 3188-11  
CLIENT: ECOLAB INC.

TABLE 5  
A 90-DAY ORAL TOXICITY STUDY IN RATS  
SUMMARY OF HEMATOLOGY DATA

PAGE 8

----- F E M A L E -----

|                    |                      | GROUP: |      |      |
|--------------------|----------------------|--------|------|------|
|                    |                      | 1      | 2    | 3    |
| LEVEL (MG/KG/DAY): |                      | 0      | 50   | 200  |
| EOSINOPHILS        | 10*3/CM <sup>3</sup> |        |      |      |
| DAY                | 91/92                |        |      |      |
|                    | MEAN                 | 0.1    | 0.1  | 0.1  |
|                    | S.D.                 | 0.09   | 0.10 | 0.06 |
|                    | N                    | 12     | 11   | 8    |

NONE SIGNIFICANTLY DIFFERENT FROM CONTROL

NOTE: THE MEANS AND STANDARD DEVIATIONS WERE CALCULATED USING NONROUNDED VALUES.

SLI STUDY NO.: 3188.11  
 CLIENT: ECOLAB INC.  
 TABLE 6  
 A 90-DAY ORAL TOXICITY STUDY IN RATS  
 SUMMARY OF BIOCHEMISTRY DATA  
 PAGE 1

|                    |       | M A L E |       |       |
|--------------------|-------|---------|-------|-------|
|                    |       | 1       | 2     | 3     |
| GROUP:             |       | 0       | 50    | 200   |
| LEVEL (MG/KG/DAY): |       |         |       |       |
| AST                | IU/L  |         |       |       |
| DAY 91/92          | MEAN  | 119     | 104   | 103   |
|                    | S.D.  | 19.0    | 15.3  | 51.9  |
|                    | N     | 12      | 11    | 11    |
| ALT                | IU/L  |         |       |       |
| DAY 91/92          | MEAN  | 32      | 31    | 43    |
|                    | S.D.  | 4.7     | 5.3   | 44.8  |
|                    | N     | 12      | 11    | 11    |
| ALK PHOS'TASE      | IU/L  |         |       |       |
| DAY 91/92          | MEAN  | 88      | 95    | 100   |
|                    | S.D.  | 19.4    | 21.2  | 30.3  |
|                    | N     | 12      | 11    | 11    |
| TOTAL BILIRUBIN    | MG/DL |         |       |       |
| DAY 91/92          | MEAN  | 0.40    | 0.37  | 0.43  |
|                    | S.D.  | 0.099   | 0.078 | 0.074 |
|                    | N     | 12      | 11    | 11    |
| TOTAL PROTEIN      | G/DL  |         |       |       |
| DAY 91/92          | MEAN  | 6.35    | 6.34  | 6.07  |
|                    | S.D.  | 0.380   | 0.246 | 0.294 |
|                    | N     | 12      | 11    | 11    |
| ALBUMIN            | G/DL  |         |       |       |
| DAY 91/92          | MEAN  | 3.51    | 3.41  | 3.34* |
|                    | S.D.  | 0.175   | 0.118 | 0.120 |
|                    | N     | 12      | 11    | 11    |

SIGNIFICANTLY DIFFERENT FROM CONTROL: \* = P<0.05  
 NOTE: THE MEANS AND STANDARD DEVIATIONS WERE CALCULATED USING NONROUNDED VALUES.

SLI STUDY NO.: 3188.11  
 CLIENT: ECOIAB INC.  
 TABLE 6  
 A 90-DAY ORAL TOXICITY STUDY IN RATS  
 SUMMARY OF BIOCHEMISTRY DATA  
 PAGE 2

|                    |        | ----- M A L E ----- |       |       |
|--------------------|--------|---------------------|-------|-------|
|                    |        | 1                   | 2     | 3     |
| GROUP:             |        | 0                   | 50    | 200   |
| LEVEL (MG/FE/DAY): |        |                     |       |       |
| GLOBULIN           | G/DL   |                     |       |       |
| DAY 91/92          | MEAN   | 2.84                | 2.92  | 2.73  |
|                    | S.D.   | 0.243               | 0.172 | 0.199 |
|                    | N      | 12                  | 11    | 11    |
| A/G RATIO          |        |                     |       |       |
| DAY 91/92          | MEAN   | 1.24                | 1.17  | 1.23  |
|                    | S.D.   | 0.085               | 0.064 | 0.070 |
|                    | N      | 12                  | 11    | 11    |
| UREA NITROGEN      | MG/DL  |                     |       |       |
| DAY 91/92          | MEAN   | 13                  | 14    | 15    |
|                    | S.D.   | 1.4                 | 1.6   | 5.9   |
|                    | N      | 12                  | 11    | 11    |
| CREATININE         | MG/DL  |                     |       |       |
| DAY 91/92          | MEAN   | 0.46                | 0.46  | 0.47  |
|                    | S.D.   | 0.045               | 0.049 | 0.043 |
|                    | N      | 12                  | 11    | 11    |
| GLUCOSE            | MG/DL  |                     |       |       |
| DAY 91/92          | MEAN   | 124                 | 128   | 138   |
|                    | S.D.   | 19.0                | 20.9  | 38.1  |
|                    | N      | 12                  | 11    | 11    |
| SODIUM             | MMOL/L |                     |       |       |
| DAY 91/92          | MEAN   | 142                 | 141   | 142   |
|                    | S.D.   | 1.2                 | 1.3   | 3.0   |
|                    | N      | 12                  | 11    | 11    |

NOTE: THE MEANS AND STANDARD DEVIATIONS WERE CALCULATED USING NONROUNDED VALUES.

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 CLIENT: ECOLAB INC.

TABLE 6  
 A 90-DAY ORAL TOXICITY STUDY IN RATS  
 SUMMARY OF BIOCHEMISTRY DATA

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----- M A L E -----

|                          | GROUP:<br>LEVEL (MG/KG/DAY) : | M A L E             |                     |                     |
|--------------------------|-------------------------------|---------------------|---------------------|---------------------|
|                          |                               | 1<br>0              | 2<br>50             | 3<br>200            |
| POTASSIUM<br>DAY 91/92   | MMOL/L                        | 5.01<br>0.296<br>12 | 5.03<br>0.173<br>11 | 4.75<br>0.286<br>11 |
| CHLORIDE<br>DAY 91/92    | MMOL/L                        | 103<br>2.0<br>12    | 104<br>1.7<br>11    | 103<br>2.2<br>11    |
| CALCIUM<br>DAY 91/92     | MG/DL                         | 9.97<br>0.204<br>12 | 9.98<br>0.241<br>11 | 9.87<br>0.452<br>11 |
| CHOLESTEROL<br>DAY 91/92 | MG/DL                         | 33<br>8.1<br>12     | 33<br>9.3<br>11     | 33<br>8.4<br>11     |
| PHOSPHORUS<br>DAY 91/92  | MG/DL                         | 6.5<br>0.56<br>12   | 6.5<br>0.51<br>11   | 7.0<br>1.38<br>11   |
| GGT, SERUM<br>DAY 91/92  | IU/L                          | 1.21<br>0.503<br>10 | 1.29<br>0.567<br>11 | 1.25<br>0.574<br>11 |

NONE SIGNIFICANTLY DIFFERENT FROM CONTROL.  
 NOTE: THE MEANS AND STANDARD DEVIATIONS WERE CALCULATED USING NONBOUNDED VALUES.

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CLIENT: ECOLAB INC.

TABLE 6  
A 90-DAY ORAL TOXICITY STUDY IN RATS  
SUMMARY OF BIOCHEMISTRY DATA

|                    |       | ----- M A L E ----- |      |      |
|--------------------|-------|---------------------|------|------|
|                    |       | 1                   | 2    | 3    |
| GROUP:             |       | 0                   | 50   | 200  |
| LEVEL (MG/KG/DAY): |       |                     |      |      |
| TRIGLYCERIDE       | MG/DL |                     |      |      |
| DAY 91/92          | MEAN  | 55                  | 53   | 55   |
|                    | S.D.  | 13.8                | 21.9 | 25.3 |
|                    | N     | 12                  | 11   | 11   |

NONE SIGNIFICANTLY DIFFERENT FROM CONTROL  
N. T. E: THE MEANS AND STANDARD DEVIATIONS WERE CALCULATED USING NONROUNDED VALUES.

SLI STUDY NO.: 3188.11  
CLIENT: ECOLAB INC.

----- F E H A L E -----

|                 |       | GROUP:<br>LEVEL (MG/KG/DAY): |         |          |
|-----------------|-------|------------------------------|---------|----------|
|                 |       | 1<br>0                       | 2<br>50 | 3<br>200 |
| AST             | IU/L  |                              |         |          |
| DAY 91/92       |       | 95                           | 86      | 75       |
|                 | MEAN  | 19.3                         | 23.0    | 11.8     |
|                 | S.D.  | 12                           | 11      | 8        |
|                 | N     |                              |         |          |
| ALT             | IU/L  |                              |         |          |
| DAY 91/92       |       | 32                           | 28      | 29       |
|                 | MEAN  | 12.9                         | 12.0    | 7.7      |
|                 | S.D.  | 12                           | 11      | 8        |
|                 | N     |                              |         |          |
| ALK PHOS'TASE   | IU/L  |                              |         |          |
| DAY 91/92       |       | 46                           | 52      | 50       |
|                 | MEAN  | 17.4                         | 13.5    | 15.0     |
|                 | S.D.  | 12                           | 11      | 8        |
|                 | N     |                              |         |          |
| TOTAL BILIRUBIN | MG/DL |                              |         |          |
| DAY 91/92       |       | 0.43                         | 0.43    | 0.48     |
|                 | MEAN  | 0.061                        | 0.042   | 0.087    |
|                 | S.D.  | 12                           | 11      | 8        |
|                 | N     |                              |         |          |
| TOTAL PROTEIN   | G/DL  |                              |         |          |
| DAY 91/92       |       | 6.47                         | 6.43    | 6.33     |
|                 | MEAN  | 0.243                        | 0.550   | 0.286    |
|                 | S.D.  | 12                           | 11      | 8        |
|                 | N     |                              |         |          |
| ALBUMIN         | G/DL  |                              |         |          |
| DAY 91/92       |       | 3.64                         | 3.66    | 3.57     |
|                 | MEAN  | 0.191                        | 0.346   | 0.212    |
|                 | S.D.  | 12                           | 11      | 8        |
|                 | N     |                              |         |          |

NONE SIGNIFICANTLY DIFFERENT FROM CONTROL.  
NOTE: THE MEANS AND STANDARD DEVIATIONS WERE CALCULATED USING NONROUNDED VALUES.

SLI STUDY NO.: 3188.11  
 CLIENT: ECOLAB INC.

TABLE 6  
 A 90-DAY ORAL TOXICITY STUDY IN RATS  
 SUMMARY OF BIOCHEMISTRY DATA

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----- F E M A L E -----

| GLUCOSAMINE<br>DAY 91/92   | G/DL | GROUP:<br>LEVEL (MG/KG/DAY): |         |          |
|----------------------------|------|------------------------------|---------|----------|
|                            |      | 1<br>0                       | 2<br>50 | 3<br>200 |
| A/G RATIO<br>DAY 91/92     | MEAN | 2.83                         | 2.78    | 2.76     |
|                            | S.D. | 0.157                        | 0.230   | 0.170    |
|                            | N    | 12                           | 11      | 8        |
| UREA NITROGEN<br>DAY 91/92 | MEAN | 1.29                         | 1.32    | 1.30     |
|                            | S.D. | 0.101                        | 0.073   | 0.101    |
|                            | N    | 12                           | 11      | 8        |
| CREATININE<br>DAY 91/92    | MEAN | 15                           | 15      | 14       |
|                            | S.D. | 1.7                          | 1.4     | 1.5      |
|                            | N    | 12                           | 11      | 8        |
| GLUCOSE<br>DAY 91/92       | MEAN | 0.50                         | 0.51    | 0.46     |
|                            | S.D. | 0.050                        | 0.050   | 0.051    |
|                            | N    | 12                           | 11      | 8        |
| SODIUM<br>DAY 91/92        | MEAN | 114                          | 116     | 120      |
|                            | S.D. | 13.2                         | 17.2    | 5.2      |
|                            | N    | 12                           | 11      | 8        |

NONE SIGNIFICANTLY DIFFERENT FROM CONTROL

NOTE: THE MEANS AND STANDARD DEVIATIONS WERE CALCULATED USING UNBOUNDED VALUES.

TABLE 6  
A 90-DAY ORAL TOXICITY STUDY IN RATS  
SUMMARY OF BIOCHEMISTRY DATA

SLI STUDY NO.: 3188.11  
CLIENT: ECOLAB INC.

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----- F E M A L E -----

|                          | GROUP:             |       |       | MEAN  | S.D. | N |
|--------------------------|--------------------|-------|-------|-------|------|---|
|                          | 1                  | 2     | 3     |       |      |   |
|                          | LEVEL (MG/KG/DAY): |       |       |       |      |   |
|                          | 0                  | 50    | 200   |       |      |   |
| POTASSIUM<br>DAY 91/92   | MMOL/L             | 4.57  | 4.47  | 4.69  |      |   |
|                          |                    | 0.158 | 0.200 | 0.186 |      |   |
|                          |                    | 12    | 11    | 8     |      |   |
| CHLORIDE<br>DAY 91/92    | MMOL/L             | 105   | 105   | 105   |      |   |
|                          |                    | 1.2   | 1.6   | 3.3   |      |   |
|                          |                    | 12    | 11    | 8     |      |   |
| CALCIUM<br>DAY 91/92     | MG/DL              | 9.95  | 10.19 | 10.19 |      |   |
|                          |                    | 0.338 | 0.371 | 0.211 |      |   |
|                          |                    | 12    | 11    | 8     |      |   |
| CHOLESTEROL<br>DAY 91/92 | MG/DL              | 45    | 40    | 45    |      |   |
|                          |                    | 8.5   | 7.6   | 3.1   |      |   |
|                          |                    | 12    | 11    | 8     |      |   |
| PHOSPHORUS<br>DAY 91/92  | MG/DL              | 5.5   | 5.8   | 5.9   |      |   |
|                          |                    | 0.61  | 0.63  | 0.64  |      |   |
|                          |                    | 12    | 11    | 8     |      |   |
| GGT, SERUM<br>DAY 91/92  | IU/L               | 1.25  | 1.23  | 1.42  |      |   |
|                          |                    | 0.550 | 0.559 | 0.512 |      |   |
|                          |                    | 12    | 11    | 8     |      |   |

NONE SIGNIFICANTLY DIFFERENT FROM CONTROL  
NOTE: THE MEANS AND STANDARD DEVIATIONS WERE CALCULATED USING UNROUNDED VALUES.

SLI STUDY NO.: 3188.11  
CLIENT: ECOLAB INC.

TABLE 6  
A 90-DAY ORAL TOXICITY STUDY IN RATS  
SUMMARY OF BIOCHEMISTRY DATA

----- F E M A L E -----

| TRIGLYCERIDE<br>DAY 91/92 | MG/DL | GROUP: |      |      |
|---------------------------|-------|--------|------|------|
|                           |       | 1      | 2    | 3    |
|                           |       | 0      | 50   | 200  |
|                           | MEAN  | 37     | 37   | 35   |
|                           | S.D.  | 11.0   | 12.8 | 10.5 |
|                           | N     | 12     | 11   | 8    |

NONE SIGNIFICANTLY DIFFERENT FROM CONTROL

NOTE: THE MEANS AND STANDARD DEVIATIONS WERE CALCULATED USING NONROUNDED VALUES.

SLI STUDY NO.: 3188.11  
 CLIENT: ECOLAB INC.

TABLE 7  
 A 90-DAY ORAL TOXICITY STUDY IN RATS  
 SUMMARY OF GROSS NECROPSY OBSERVATIONS  
 (FOUND DEAD)

|                              | ----- M A L E ----- |    |     |
|------------------------------|---------------------|----|-----|
| GROUP:<br>LEVEL (MG/KG/DAY): | 1                   | 2  | 3   |
| NUMBER OF ANIMALS EXAMINED   | 0                   | 50 | 200 |
| ADRENAL<br>-DARK RED         | 0                   | 0  | 1   |
| HAIROCOAT<br>-DARK MATERIAL  | 0                   | 0  | 1   |
| LUNG<br>-MOTTLED             | 0                   | 1  | 1   |

SLI STUDY NO.: 3188.11  
 CLIENT: ECOLAB INC.

TABLE 7  
 A 90-DAY ORAL TOXICITY STUDY IN RATS  
 SUMMARY OF GROSS NECROPSY OBSERVATIONS  
 (FOUND DEAD)

|                                  | ----- F E M A L E -----      |   |    |     |
|----------------------------------|------------------------------|---|----|-----|
|                                  | GROUP:<br>LEVEL (MG/KG/DAY): | 1 | 2  | 3   |
| NUMBER OF ANIMALS EXAMINED       |                              | 0 | 50 | 200 |
| ALL TISSUES WITHIN NORMAL LIMITS |                              | 0 | 1  | 4   |
|                                  |                              | 0 | 1  | 0   |
| CECUM                            |                              |   |    |     |
| -DISTENDED                       |                              | 0 | 0  | 1   |
| DUODENUM                         |                              |   |    |     |
| -CONTENT ABNORMAL                |                              | 0 | 0  | 2   |
| ESOPHAGUS                        |                              |   |    |     |
| -CONTENT ABNORMAL                |                              | 0 | 0  | 1   |
| HAIRCOAT                         |                              |   |    |     |
| -WET MATTING                     |                              | 0 | 0  | 2   |
| -DARK MATERIAL                   |                              | 0 | 0  | 2   |
| SMALL INTESTINE                  |                              |   |    |     |
| -DISTENDED                       |                              | 0 | 0  | 1   |
| JEJUNUM                          |                              |   |    |     |
| -CONTENT ABNORMAL                |                              | 0 | 0  | 1   |
| KIDNEY                           |                              |   |    |     |
| -TAN AREA(S)                     |                              | 0 | 0  | 1   |
| LUNG                             |                              |   |    |     |
| -MOTTLED                         |                              | 0 | 0  | 3   |
| -CONSOLIDATED                    |                              | 0 | 0  | 2   |
| -DARK RED                        |                              | 0 | 0  | 1   |

SLI STUDY NO.: 3188.11  
 CLIENT: ECOLAB INC.

TABLE 7  
 A 90-DAY ORAL TOXICITY STUDY IN RATS  
 SUMMARY OF GROSS NECROPSY OBSERVATIONS  
 (FOUND DEAD)

PAGE 3

|                                  | ----- FEMALE -----           |        |         |          |
|----------------------------------|------------------------------|--------|---------|----------|
|                                  | GROUP:<br>LEVEL (MG/KG/DAY): | 1<br>0 | 2<br>50 | 3<br>200 |
| NUMBER OF ANIMALS EXAMINED       |                              | 0      | 1       | 4        |
| ALL TISSUES WITHIN NORMAL LIMITS |                              | 0      | 1       | 0        |
| ORAL CAVITY                      |                              |        |         |          |
| -CONTENT ABNORMAL                |                              | 0      | 0       | 2        |
| STOMACH                          |                              |        |         |          |
| -FOCI                            |                              | 0      | 0       | 1        |
| -DISTENDED                       |                              | 0      | 0       | 1        |
| -REDDENED                        |                              | 0      | 0       | 1        |

SLI STUDY NO.: 3188.11  
CLIENT: FOOLAB INC.

TABLE 7  
A 90-DAY ORAL TOXICITY STUDY IN RATS  
SUMMARY OF GROSS NECROPSY OBSERVATIONS  
(SCHEDULED EUTHANASIA - DAY 91/92)

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|                                  | M A L E |    |     |
|----------------------------------|---------|----|-----|
|                                  | 1       | 2  | 3   |
| GROUP:                           | 1       | 2  | 3   |
| LEVEL (MG/KG/DAY):               | 0       | 50 | 200 |
| NUMBER OF ANIMALS EXAMINED       | 12      | 11 | 11  |
| ALL TISSUES WITHIN NORMAL LIMITS | 6       | 3  | 1   |
| HAIRCOAT                         |         |    |     |
| -WET MATTING                     | 0       | 0  | 1   |
| -DARK MATERIAL                   | 0       | 0  | 1   |
| -HAIRLOSS                        | 0       | 1  | 1   |
| SMALL INTESTINE                  |         |    |     |
| -DISTENDED                       | 0       | 0  | 1   |
| LARGE INTESTINE                  |         |    |     |
| -DISTENDED                       | 0       | 0  | 1   |
| KIDNEY                           |         |    |     |
| -DILATED PELVIS                  | 0       | 0  | 1   |
| LIVER                            |         |    |     |
| -TAN AREA(S)                     | 0       | 2  | 1   |
| LUNG                             |         |    |     |
| -MOTTLED                         | 0       | 0  | 2   |
| -FOCI                            | 2       | 4  | 3   |
| -NOBLE(S)                        | 0       | 0  | 1   |
| MANDIBULAR LYMPH NODE            |         |    |     |
| -ENLARGED                        | 0       | 1  | 1   |
| -REDDENED                        | 0       | 0  | 1   |

SLI STUDY NO.: 3188.11  
 CLIENT: ECOLAB INC.

TABLE 7  
 A 90-DAY ORAL TOXICITY STUDY IN RATS  
 SUMMARY OF GROSS NECROPSY OBSERVATIONS  
 (SCHEDULED EUTHANASIA - DAY 91/92)

|   | M A L E |    |     |
|---|---------|----|-----|
|   | 1       | 2  | 3   |
| GROUP:  | 12      | 11 | 11  |
| LEVEL (MG/KG/DAY):  | 0       | 50 | 200 |
| NUMBER OF ANIMALS EXAMINED                                | 12      | 11 | 11  |
| ALL TISSUES WITHIN NORMAL LIMITS                          | 6       | 3  | 1   |
| PITUITARY   |         |    |     |
| -FOCI   | 1       | 0  | 0   |
| -CYST(S)  | 0       | 1  | 0   |
| THYRUS  |         |    |     |
| -FOCI   | 1       | 1  | 3   |
| GENERAL COMMENT   |         |    |     |
| -FINAL CLINICAL OBSERVATION NOT APPARENT                  | 4       | 1  | 1   |
| POSTMORTEM  |         |    |     |
| -OCULAR LESION PRODUCED DURING BLOOD COLLECTION PROCEDURE | 0       | 0  | 1   |

SLI STUDY NO.: 3188.11  
 CLIENT: ECOLAB INC.

TABLE 7  
 A 90-DAY ORAL TOXICITY STUDY IN RATS  
 SUMMARY OF GROSS NECROPSY OBSERVATIONS  
 (SCHEDULED EUTHANASIA - DAY 91/92)

PAGE 6

----- F E M A L E -----

|                                  | GROUP:<br>LEVEL (MG/KG/DAY): | 1  | 2  | 3   |
|----------------------------------|------------------------------|----|----|-----|
| NUMBER OF ANIMALS EXAMINED       |                              | 0  | 50 | 200 |
| ALL TISSUES WITHIN NORMAL LIMITS |                              | 12 | 11 | 8   |
|                                  |                              | 8  | 3  | 3   |
| HAIRCOAT                         |                              |    |    |     |
| -DARK MATERIAL                   |                              | 0  | 1  | 0   |
| -HAIRLOSS                        |                              | 3  | 2  | 0   |
| -DRYED MATTED MATERIAL           |                              | 0  | 0  | 1   |
| LIVER                            |                              |    |    |     |
| -TAN AREA(S)                     |                              | 0  | 2  | 1   |
| LUNG                             |                              |    |    |     |
| -MOTTLE                          |                              | 0  | 1  | 2   |
| -FOCI                            |                              | 1  | 0  | 1   |
| -LESION                          |                              | 0  | 1  | 0   |
| MEDIASTINAL LYMPH NODE           |                              |    |    |     |
| -DARK RED                        |                              | 0  | 1  | 0   |
| ORAL CAVITY                      |                              |    |    |     |
| -INCISOR - MALALIGNED            |                              | 0  | 1  | 0   |
| SKIN                             |                              |    |    |     |
| -SCABBING                        |                              | 1  | 0  | 0   |
| STOMACH                          |                              |    |    |     |
| -FOCI                            |                              | 2  | 1  | 1   |

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 CLIENT: EOLAB INC.

TABLE 7  
 A 90-DAY ORAL TOXICITY STUDY IN RATS  
 SUMMARY OF GROSS NECROPSY OBSERVATIONS  
 (SCHEDULED EUTHANASIA - DAY 91/92)

PAGE 7

----- FEMALE -----

| GROUP:                                   | 1  | 2  | 3   |
|--|----|----|-----|
| LEVEL (MG/KG/DAY):                       | 0  | 50 | 200 |
| NUMBER OF ANIMALS EXAMINED               | 12 | 11 | 8   |
| ALL TISSUES WITHIN NORMAL LIMITS         | 8  | 3  | 3   |
| THYMUS                                   |    |    |     |
| -FOCI                                    | 0  | 1  | 0   |
| -DARK RED AREA(S)                        | 0  | 1  | 0   |
| GENERAL COMMENT                          |    |    |     |
| -FINAL CLINICAL OBSERVATION NOT APPARENT | 0  | 1  | 0   |
| POSTMORTEM                               |    |    |     |

TABLE 8  
 A 90-DAY ORAL TOXICITY STUDY IN RATS  
 SUMMARY OF ABSOLUTE ORGAN WEIGHT DATA (CFRMS)  
 (SCHEDULED EUTHANASIA - DAY 91/92)

SLI STUDY NO.: 3188-11  
 CLIENT: ECOLAB INC.

|                      | M A I E                      |         |         |          |
|----------------------|------------------------------|---------|---------|----------|
|                      | GROUP:<br>LEVEL (MG/KG/DAY): | 1<br>0  | 2<br>50 | 3<br>200 |
| BRAIN                | MEAN                         | 2.21    | 2.19    | 2.14     |
|                      | S.D.                         | 0.125   | 0.113   | 0.066    |
|                      | N                            | 12      | 11      | 11       |
| ADRENALS             | MEAN                         | 0.0619  | 0.0625  | 0.0639   |
|                      | S.D.                         | 0.00775 | 0.00722 | 0.01108  |
|                      | N                            | 12      | 11      | 11       |
| THYROIDS             | MEAN                         | 0.0227  | 0.0211  | 0.0242   |
|                      | S.D.                         | 0.00414 | 0.00448 | 0.00393  |
|                      | N                            | 12      | 11      | 11       |
| KIDNEYS              | MEAN                         | 3.77    | 3.80    | 3.81     |
|                      | S.D.                         | 0.471   | 0.428   | 0.425    |
|                      | N                            | 12      | 11      | 11       |
| TESTES/EPIDIDYIMIDES | MEAN                         | 4.91    | 4.80    | 4.80     |
|                      | S.D.                         | 0.239   | 0.421   | 0.373    |
|                      | N                            | 12      | 11      | 11       |
| SPLLEN               | MEAN                         | 0.76    | 0.81    | 0.68     |
|                      | S.D.                         | 0.131   | 0.125   | 0.217    |
|                      | N                            | 12      | 11      | 11       |

NONE SIGNIFICANTLY DIFFERENT FROM CONTROL

SLI STUDY NO.: 3188.11  
 CLIENT: ECOLAB INC.

TABLE 8  
 A 90-DAY ORAL TOXICITY STUDY IN RATS  
 SUMMARY OF ABSOLUTE ORGAN WEIGHT DATA (GRAMS)  
 (SCHEDULED EUTHANASIA - DAY 91/92)

PAGE 2

|                    |      | ----- M A L E ----- |       |       |
|--------------------|------|---------------------|-------|-------|
| GROUP:             |      | 1                   | 2     | 3     |
| LEVEL (MG/KG/DAY): |      | 0                   | 50    | 200   |
| THYROID            | MEAN | 0.33                | 0.31  | 0.25* |
|                    | S.D. | 0.059               | 0.085 | 0.079 |
|                    | N    | 12                  | 11    | 11    |
| HEART              | MEAN | 1.53                | 1.63  | 1.54  |
|                    | S.D. | 0.242               | 0.220 | 0.113 |
|                    | N    | 12                  | 11    | 11    |
| LIVER              | MEAN | 14.06               | 14.02 | 13.12 |
|                    | S.D. | 2.124               | 1.881 | 2.023 |
|                    | N    | 12                  | 11    | 11    |

SIGNIFICANTLY DIFFERENT FROM CONTROL: \* = P<0.05

SLI STUDY NO.: 3188.11  
 CLIENT: ECO LAB INC.

TABLE 8  
 A. 90-DAY ORAL TOXICITY STUDY IN RATS  
 SUMMARY OF ABSOLUTE ORGAN WEIGHT DATA (GRAMS)  
 (SCHEDULED EUTHANASIA - DAY 91/92)

PAGE 3

----- F E M A L E -----

|                    | GROUP:  |         |         |
|--------------------|---------|---------|---------|
|                    | 1       | 2       | 3       |
| LEVEL (MG/KG/DAY): | 0       | 50      | 200     |
| <b>BRAIN</b>       |         |         |         |
| MEAN               | 2.01    | 2.02    | 1.99    |
| S.D.               | 0.120   | 0.063   | 0.115   |
| N                  | 12      | 11      | 8       |
| <b>ADRENALS</b>    |         |         |         |
| MEAN               | 0.0659  | 0.0734  | 0.0682  |
| S.D.               | 0.00758 | 0.00871 | 0.00983 |
| N                  | 12      | 11      | 8       |
| <b>THYROID</b>     |         |         |         |
| MEAN               | 0.0179  | 0.0181  | 0.0182  |
| S.D.               | 0.00393 | 0.00482 | 0.00397 |
| N                  | 12      | 11      | 8       |
| <b>OVARIES</b>     |         |         |         |
| MEAN               | 0.0830  | 0.0810  | 0.0787  |
| S.D.               | 0.01100 | 0.01001 | 0.00965 |
| N                  | 12      | 11      | 8       |
| <b>KIDNEYS</b>     |         |         |         |
| MEAN               | 2.02    | 2.03    | 2.02    |
| S.D.               | 0.131   | 0.170   | 0.119   |
| N                  | 12      | 11      | 8       |
| <b>SPLEEN</b>      |         |         |         |
| MEAN               | 0.46    | 0.50    | 0.43    |
| S.D.               | 0.058   | 0.161   | 0.062   |
| N                  | 12      | 11      | 8       |

NONE SIGNIFICANTLY DIFFERENT FROM CONTROL

SLI STUDY NO.: 3188.11  
 CLIENT: ECO LAB INC.

TABLE 8  
 A 90-DAY ORAL TOXICITY STUDY IN RATS  
 SUMMARY OF ABSOLUTE ORGAN WEIGHT DATA (GRAMS)  
 (SCHEDULED EUTHANASIA - DAY 91/92)

PAGE 4

----- FEMALE -----

|                    | GROUP: |       |       |
|--------------------|--------|-------|-------|
|                    | 1      | 2     | 3     |
| LEVEL (MG/KG/DAY): | 0      | 50    | 200   |
| THYROID            |        |       |       |
| MEAN               | 0.27   | 0.25  | 0.24  |
| S.D.               | 0.037  | 0.036 | 0.049 |
| N                  | 12     | 11    | 8     |
| HEART              |        |       |       |
| MEAN               | 0.97   | 0.94  | 0.99  |
| S.D.               | 0.043  | 0.102 | 0.072 |
| N                  | 12     | 11    | 8     |
| LIVER              |        |       |       |
| MEAN               | 7.62   | 7.53  | 7.01  |
| S.D.               | 0.961  | 1.041 | 0.445 |
| N                  | 12     | 11    | 8     |

----- NONE SIGNIFICANTLY DIFFERENT FROM CONTROL -----

TABLE 9  
 A 90-DAY ORAL TOXICITY STUDY IN RATS  
 SUMMARY OF ORGAN WEIGHT DATA RELATIVE TO FINAL BODY WEIGHT (%)  
 (SCHEDULED EUTHANASIA - DAY 91/92)

|                       | M A L E                      |         |         |          |
|-----------------------|------------------------------|---------|---------|----------|
|                       | GROUP:<br>LEVEL (MG/KG/DAY): | 1<br>0  | 2<br>50 | 3<br>200 |
| FINAL BODY WEIGHT (g) |                              |         |         |          |
| MEAN                  | 515                          | 512     | 481     |          |
| S.D.                  | 61.3                         | 42.2    | 54.9    |          |
| N                     | 12                           | 11      | 11      |          |
| MEAN                  | 0.43                         | 0.43    | 0.45    |          |
| S.D.                  | 0.039                        | 0.028   | 0.052   |          |
| N                     | 12                           | 11      | 11      |          |
| ADRENALS              |                              |         |         |          |
| MEAN                  | 0.0121                       | 0.0123  | 0.0134  |          |
| S.D.                  | 0.00151                      | 0.00150 | 0.00256 |          |
| N                     | 12                           | 11      | 11      |          |
| THYROID               |                              |         |         |          |
| MEAN                  | 0.0645                       | 0.0041  | 0.0051  |          |
| S.D.                  | 0.00103                      | 0.00096 | 0.00100 |          |
| N                     | 12                           | 11      | 11      |          |
| KIDNEYS               |                              |         |         |          |
| MEAN                  | 0.73                         | 0.74    | 0.79*   |          |
| S.D.                  | 0.037                        | 0.051   | 0.067   |          |
| N                     | 12                           | 11      | 11      |          |
| TESTES/EPIDIDIMIDES   |                              |         |         |          |
| MEAN                  | 0.97                         | 0.94    | 1.01    |          |
| S.D.                  | 0.132                        | 0.094   | 0.101   |          |
| N                     | 12                           | 11      | 11      |          |

SIGNIFICANTLY DIFFERENT FROM CONTROL: \* = P<0.05

SLI STUDY NO.: 3188.11  
CLIENT: ECOLAB INC.  
A 90-DAY ORAL TOXICITY STUDY IN RATS  
SUMMARY OF ORGAN WEIGHT DATA RELATIVE TO FINAL BODY WEIGHT (%)  
(SCHEDULED EUTHANASIA - DAY 91/92)

----- M A L E -----

|        | GROUP:             |       |       | M A L E |       |       |
|--------|--------------------|-------|-------|---------|-------|-------|
|        | 1                  | 2     | 3     | 1       | 2     | 3     |
|        | LEVEL (MG/KG/DAY): |       |       | 200     |       |       |
|        | 0                  | 50    | 200   | 0       | 50    | 200   |
| SPLEEN | MEAN               | 0.15  | 0.16  | 0.14    | 0.16  | 0.14  |
|        | S.D.               | 0.014 | 0.023 | 0.036   | 0.023 | 0.036 |
|        | N                  | 12    | 11    | 11      | 11    | 11    |
| THYMUS | MEAN               | 0.06  | 0.06  | 0.05    | 0.06  | 0.05  |
|        | S.D.               | 0.010 | 0.017 | 0.014   | 0.017 | 0.014 |
|        | N                  | 12    | 11    | 11      | 11    | 11    |
| HEART  | MEAN               | 0.30  | 0.32  | 0.32    | 0.32  | 0.32  |
|        | S.D.               | 0.030 | 0.044 | 0.032   | 0.044 | 0.032 |
|        | N                  | 12    | 11    | 11      | 11    | 11    |
| LIVER  | MEAN               | 2.72  | 2.73  | 2.73    | 2.73  | 2.73  |
|        | S.D.               | 0.156 | 0.180 | 0.238   | 0.180 | 0.238 |
|        | N                  | 12    | 11    | 11      | 11    | 11    |

NONE SIGNIFICANTLY DIFFERENT FROM CONTROL

SLI STUDY NO.: 3188.11  
 CLIENT: ECOLAB INC.

TABLE 9  
 A 90-DAY ORAL TOXICITY STUDY IN RATS  
 SUMMARY OF ORGAN WEIGHT DATA RELATIVE TO FINAL BODY WEIGHT (%)  
 (SCHEDULED EUTHANASIA - DAY 91/92)

PAGE 3

----- F E M A L E -----

|                       | GROUP:  |         |         |
|-----------------------|---------|---------|---------|
|                       | 1       | 2       | 3       |
| LEVEL (MG/KG/DAY):    | 0       | 50      | 200     |
| FINAL BODY WEIGHT (g) |         |         |         |
| MEAN                  | 271     | 263     | 257     |
| S.D.                  | 27.8    | 27.6    | 18.6    |
| N                     | 12      | 11      | 8       |
| BRAIN                 |         |         |         |
| MEAN                  | 0.75    | 0.78    | 0.78    |
| S.D.                  | 0.053   | 0.081   | 0.037   |
| N                     | 12      | 11      | 8       |
| ADRENALS              |         |         |         |
| MEAN                  | 0.0245  | 0.0282  | 0.0267  |
| S.D.                  | 0.00351 | 0.00457 | 0.00440 |
| N                     | 12      | 11      | 8       |
| THYROIDIS             |         |         |         |
| MEAN                  | 0.0067  | 0.0069  | 0.0071  |
| S.D.                  | 0.00154 | 0.00186 | 0.00152 |
| N                     | 12      | 11      | 8       |
| OVARIES               |         |         |         |
| MEAN                  | 0.0308  | 0.0310  | 0.0307  |
| S.D.                  | 0.00452 | 0.00421 | 0.00365 |
| N                     | 12      | 11      | 8       |
| KIDNEYS               |         |         |         |
| MEAN                  | 0.75    | 0.77    | 0.79    |
| S.D.                  | 0.043   | 0.041   | 0.035   |
| N                     | 12      | 11      | 8       |

NONE SIGNIFICANTLY DIFFERENT FROM CONTROL

TABLE 9  
 A 90-DAY ORAL TOXICITY STUDY IN RATS  
 SUMMARY OF ORGAN WEIGHT DATA RELATIVE TO FINAL BODY WEIGHT (%)  
 (SCHEDULED EUTHANASIA - DAY 91/92)

SLI STUDY NO.: 3188.11  
 CLIENT: ECOLAB INC.

PAGE 4

----- FEMALE -----

|                    | GROUP: |       |       |       |
|--------------------|--------|-------|-------|-------|
|                    | 1      | 2     | 3     |       |
| LEVEL (MG/KG/DAY): | 0      | 50    | 200   |       |
| SPLEEN             | MEAN   | 0.17  | 0.19  | 0.17  |
|                    | S.D.   | 0.021 | 0.059 | 0.022 |
|                    | N      | 12    | 11    | 8     |
| THYMUS             | MEAN   | 0.10  | 0.10  | 0.09  |
|                    | S.D.   | 0.013 | 0.016 | 0.014 |
|                    | N      | 12    | 11    | 8     |
| HEART              | MEAN   | 0.36  | 0.36  | 0.38  |
|                    | S.D.   | 0.030 | 0.029 | 0.028 |
|                    | N      | 12    | 11    | 8     |
| LIVER              | MEAN   | 2.82  | 2.87  | 2.74  |
|                    | S.D.   | 0.235 | 0.316 | 0.127 |
|                    | N      | 12    | 11    | 8     |

NONE SIGNIFICANTLY DIFFERENT FROM CONTROL

**CERTIFICATE OF AUTHENTICITY**

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