FINAL REPORT

Volume 1 of 2
(Text, Figures 1-36, Tables 1-9 and Appendices A-H)

STUDY TITLE

INTER-LABORATORY[1] VALIDATION OF THE 15-DAY ADULT INTACT MALE RAT ASSAY WITH LINURON AND PHENOBARBITAL (WA 5-15)

STUDY NUMBER

WIL-431014

EPA CONTRACT NUMBER

68-W-01-023

STUDY DIRECTOR

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STUDY INITIATION DATE

3 October 2005

STUDY COMPLETION DATE

12 May 2006

PERFORMING LABORATORY

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[1] = The study described in this report was performed by a single laboratory, but will be used in support of an inter-laboratory validation of this bioassay.

COMPLIANCE STATEMENT

This study, designated WIL-431014, was conducted in compliance with the United States Environmental Protection Agency (EPA) Good Laboratory Practice Standards (40 CFR Part 160), 16 October 1989; the United States Environmental Protection Agency (EPA) Good Laboratory Practice Standards (40 CFR Part 792), 18 September 1989; the Organisation for Economic Cooperation and Development (OECD) Principles of Good Laboratory Practice [C (97) 186/Final], 26 November 1997; the Japanese Ministry of Agriculture, Forestry and Fisheries (MAFF) Good Laboratory Standards (59 NohSan No. 3850), 10 August 1984; the standard operating procedures of WIL Research Laboratories, LLC, and the protocol as approved by the sponsor.

12 MAY 2006

Christopher J. Bowman, PhD, DABT
Staff Toxicologist, Developmental and
Reproductive Toxicology
Study Director

Date

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VOLUME 2

1. EXECUTIVE SUMMARY

1.1. PURPOSE AND OBJECTIVE

The overall purpose of the study was to participate in an interlaboratory validation of the 15-day adult intact male rat assay and present results from WIL Research Laboratories, LLC to be used for the subsequent determination of whether independent laboratories can obtain similar results when using the assay with a similar protocol, test substances and dosage levels. A secondary purpose was to determine if the observed results from this interlaboratory validation are comparable to the expected results established in earlier studies using a similar protocol.

The specific purpose of this study was to evaluate the adult male rat assay using 2 test substances that have known endocrine activity. This assay has been previously reviewed in the context of other screening assays (O'Connor et al., 2002a).

The objective of this study was to evaluate the ability of this assay to detect endocrine active chemicals by measuring body and organ weight changes, microscopic changes and changes in circulating concentrations of hormones. The following hormones were analyzed: testosterone, luteinizing hormone, thyroid-stimulating hormone, thyroxine, triiodothyronine, follicle-stimulating hormone, estradiol, prolactin and dihydrotestosterone.

1.2. STUDY DESIGN

Linuron or phenobarbital was administered orally by gavage once daily, for 15 consecutive days to 6 groups (Groups 2-4: linuron; Groups 5-7: phenobarbital) of adult male Crl:CD®(SD) rats; each group consisted of 15 animals. Dosage levels were 50, 100 and 150 mg/kg/day of linuron or 25, 50 and 100 mg/kg/day of phenobarbital. A concurrent control group (Group 1) received 0.25% methylcellulose on a comparable regimen. The dosage volume for all groups was 5 mL/kg, and dose administration occurred between 0606 hours and 0939 hours. All animals were observed twice daily for mortality and moribundity. Detailed physical examinations and body weights were

recorded daily from Test Day 1 to 15, and food consumption was recorded weekly (Test Days 1, 8 and 15). Clinical observations were recorded approximately 6 hours following dose administration on Test Days 1-14. Serum hormone analyses were performed on blood collected from all animals surviving to the scheduled necropsy 1 hour 54 minutes to 4 hours 31 minutes following dose administration on Test Day 15. Complete necropsies were conducted on all animals, and selected organs were weighed at the scheduled necropsies. Thyroids, testes and epididymides were examined microscopically from animals from the control and high dosage groups for each test substance. All in-life and postmortem activities, with the exception of tissue fixation, processing and pathology evaluation, were conducted blind to treatment group.

1.3. RESULTS

Based on documentation in the study records, the analytical chemistry results being within specifications and the absence of GLP deviations and adverse deviations from the protocol or the current WIL SOPs, the test substance formulations were considered to have been properly prepared and the study animals adequately exposed to the test substances at the correct concentrations with stable and homogeneous formulations such that the assay was considered to reliably predict toxicity (both endocrine and general depending on the severity of the effects on body weights). The performance and outcome of all hormone analyses were considered acceptable for interpreting test substance-related differences from control based on the overall low variability and consistency of these radioimmunoassays.

1.3.1. LINURON

In the current study, 4 of 15, 7 of 15 and 13 of 14 animals in the 50, 100 and 150 mg/kg/day linuron groups, respectively, had a decrease in final body weight of >15% relative to the vehicle control group mean. For these animals, this marked effect on body weight likely resulted in some secondary changes in organ weights and hormones, depending on the specific tissue and hormone (O'Connor et al., 2000). In general, because 47% and 93% of the animals in the 100 and 150 mg/kg/day groups, respectively,

had a >15% decrease in final body weight relative to the control group, these dosage levels were considered at or exceeding the maximally tolerated dose (MTD). Consistent with exceeding the MTD, there was 1 animal in the high dosage group euthanized in extremis on Test Day 6. In addition to the marked body weight loss and decreased body weight gain, mean food consumption was decreased in a dose-dependent, statistically significant manner between Test Day 1 and 15. There were also many test substance-related clinical observations observed in the 100 and/or 150 mg/kg/day linuron groups prior to dose administration and/or 6 hours following dose administration throughout the study (impaired mobility, piloerection, hypoactivity, decreased defecation, hair loss, red material around mouth, nose and eyes, rocks, lurches or sways while walking and lying on side with limbs extended).

In addition to the general toxicity observed in these animals, endocrine-related changes consistent with inhibition of androgen action were observed. These changes included significant decreases in mean absolute prostate, seminal vesicle and accessory sex gland weights in all linuron-treated groups with only the effects at the lowest dosage not considered confounded by the decreased final body weight relative to the control group. Relative (to final body weight) organ weight changes were observed in the accessory sex organs but were not dose-related. There were slight decreases in testosterone, dihydrotestosterone and prolactin coupled with slight but generally statistically significant increases in estradiol and follicle-stimulating hormone. While these findings were consistent with previous studies with linuron, testosterone, dihydrotestosterone and prolactin levels may have been affected by the decrease in final body weight compared to the control.

Mean T4 in all linuron treated groups and mean T3 in the 100 and 150 mg/kg/day groups were statistically significantly decreased following linuron treatment, and mean thyroid-stimulating hormone was only numerically decreased in the 100 and 150 mg/kg/day groups. There were no correlating histopathologic changes in the thyroid or biologically significant changes in mean thyroid weights. Without supportive changes

in thyroid weights or histopathology, the relationship of the decreased T3 and T4 to the administration of linuron is uncertain.

1.3.2. PHENOBARBITAL

In the current study, 1 animal in the 100 mg/kg/day group was found dead on Test Day 4. The effects observed in this animal were slightly more severe, but in general all 100 mg/kg/day phenobarbital-treated rats exhibited impaired mobility, hypoactivity, lying on side with limbs extended and rocks, lurches or sways while walking following dose administration throughout the study. Dried red material around nose and eyes were also observed in most of the 100 mg/kg/day animals; this finding was generally noted on Test Days 3, 4 or 5. Mean body weight gain and mean food consumption were statistically significantly decreased in the high dosage phenobarbital group between Test Days 1 and 8, resulting in statistically significantly reduced mean body weight gain between Test Days 1 and 15.

Consistent with the known mechanism of phenobarbital thyrotoxication, all phenobarbital-treated rats had decreased levels of T3 and T4 and increased levels of thyroid-stimulating hormone and increased mean absolute and relative thyroid and liver weights. These changes correlated with the microscopic thyroid changes in the 100 mg/kg/day group. These microscopic changes in the thyroid included increased follicular cell height, decreased colloid area and increased mitotic figures suggesting thyroid cell proliferation consistent with the increased thyroid weights.

Changes in reproductive hormones in all phenobarbital-treated groups included slight decreases in testosterone, dihydrotestosterone and follicle-stimulating hormone and a slight increase in estradiol; the differences from the control group were generally statistically significant. Despite minor inconsistencies in the literature, the profile of hormone changes was generally consistent with that observed previously with phenobarbital (O'Connor et al., 1999; O'Connor et al., 2002b).

Histopathological effects were also observed in the testes and epididymides of rats treated with 100 mg/kg/day phenobarbital. Consistent with a previous report (O'Connor et al., 2002b), spermatid retention was observed in 5 of 14 animals, characterized by retention of step 19 spermatids at the luminal surface beyond stage IX. Though not noted previously, increased multifocal mononuclear cell infiltrates were observed in the epididymides of 100 mg/kg/day phenobarbital rats compared to controls. The significance of this observation is uncertain.

1.4. CONCLUSIONS

The data presented in the current study supports validation of this screening assay for potential thyroid disruptors based on the full complement of endpoints utilized (organ weights, thyroid hormones and histopathology), but caution should be used when interpreting changes in thyroid hormones alone (e.g., antiandrogens). It has been suggested that endocrine effects of antiandrogens such as linuron (and other antiandrogens such as p,p'-DDE) are relatively insensitive to detection in adult intact male rats except at overtly toxic dosages (Gray et al., 2001). The interpretation of the linuron data in the current study may not lend itself to appropriately assess the presumed unique sensitivity of the endocrine system to antiandrogens in adult intact male rats due to the limited measurable effects that were not considered influenced by the general toxicity observed (e.g., decreased final body weight relative to the control group). When considered collectively, the results of this study were comparable to previous studies with these test substances at these dosage levels with a few notable exceptions, and were therefore considered suitable for interlaboratory comparisons for the purposes of validating this 15-Day Adult Intact Male Rat Assay.

2. INTRODUCTION

2.1. GENERAL STUDY INFORMATION

This report presents the data from "Inter-Laboratory Validation Of The 15-Day Adult Intact Male Rat Assay with Linuron And Phenobarbital (WA 5-15)".

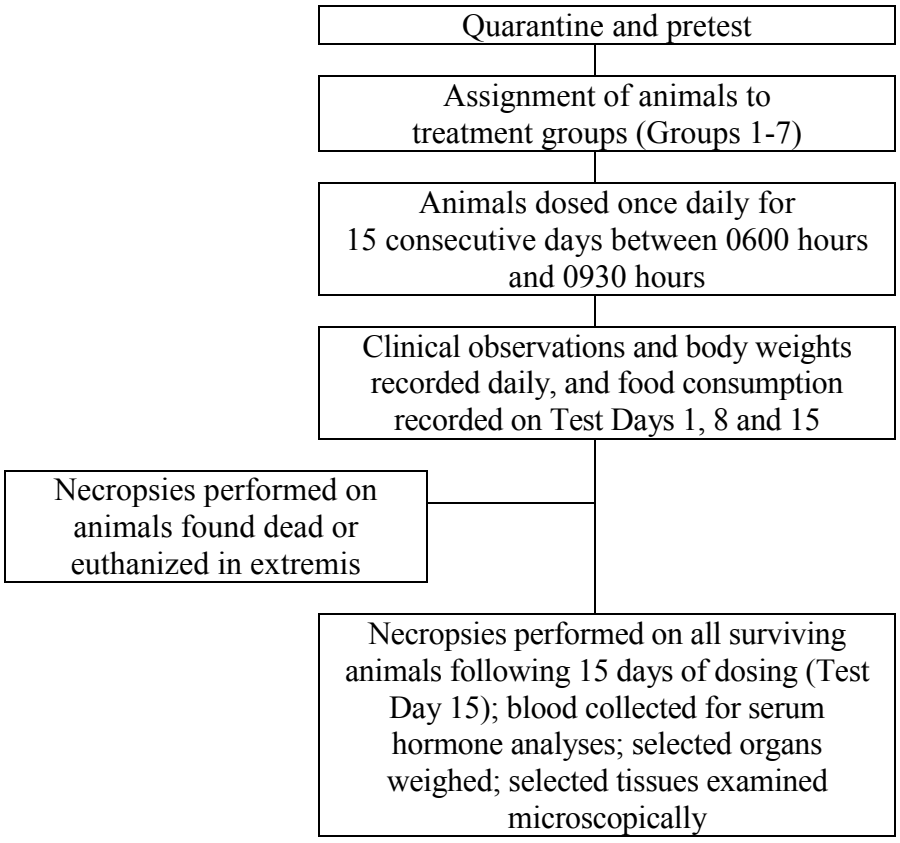
The following computer protocol was used for data collection during the study:

Computer Protocol	Type of Data Collected
WIL-431014	Main study data

2.2. KEY STUDY DATES

Date(s)	Event(s)
18 October 2005	Experimental starting date (animal receipt)
21 October 2005	Assignment to study groups
24 October 2005	Experimental start date (initiation of dose administration)
24 October - 9 November 2005	Dosing period (Test Days 1-15; the start of dose administration was staggered over 3 days)
7-9 November 2005	Necropsies (Test Day 15; the end of dose administration/necropsies were staggered over 3 days)
13 December 2005	Experimental termination (completion) date (last histopathological examination)

3. STUDY DESIGN



4. EXPERIMENTAL PROCEDURES - MATERIALS AND METHODS

4.1. TEST AND VEHICLE CONTROL SUBSTANCES

4.1.1. TEST SUBSTANCES IDENTIFICATION

The test substances, linuron and phenobarbital, were received from Marine Sciences Laboratory of Battelle Northwest, Sequim, Washington, on 13 September 2005, as follows:

Identification	Quantity Received	Physical Description
Linuron[1] Lot no. 348-8A Exp. date: August 2008 CAS no. 330-55-2 [WIL log no. 6623A]	2 bottles Total gross weight: 247.6 g	White powder
Phenobarbital[2] Lot no. 104K2600 Exp. date: February 2010 CAS no. 50-06-6 [WIL log no. 6624A]	1 bottle Gross weight: 128.8 g	White powder

[1] = Sponsor-determined (manufacturer) purity: 97.69% (99.5%)
[2] = Sponsor-determined (manufacturer) purity: 99.98% (99.1%)

Certificates of Analysis for the test substances were provided by the manufacturer and are presented in Appendix A. Additional characterization of the test substances was performed by the sponsor, and the results of the characterization are presented in Appendix B. The dosing formulations were not adjusted for purity. The test substances were stored at room temperature, and were considered stable under this condition. Reserve samples of linuron and phenobarbital (0.101 g and 0.115 g, respectively) were collected on 11 October 2005, and stored in the Archives of WIL Research Laboratories, LLC.

4.1.2. VEHICLE CONTROL SUBSTANCE IDENTIFICATION

The vehicle used in preparation of the test substance formulations and for administration to the control group, 0.25% methylcellulose in deionized water, was received from Marine Sciences Laboratory of Battelle Northwest, Sequim, Washington, on 13 September 2005, as follows:

Identification	Quantity Received	Physical Description
0.25% Methylcellulose in deionized water Lot no. 062K0144 Exp. date: 30 November 2005 CAS no. 9004-67-5 [WIL log no. 6622A]	6 bottles[1]	Clear, colorless liquid

[1] = 5 bottles were used in the study

A reserve sample of the vehicle (0.593 g) was collected on 11 October 2005 and stored refrigerated in the Archives of WIL Research Laboratories, LLC.

4.1.3. PREPARATION

For the control group (Group 1), a sufficient amount of 0.25% methylcellulose in deionized water was transferred to a glass container. The vehicle was divided into aliquots for daily dispensation and stored refrigerated. The vehicle was stirred continuously throughout sampling, dispensation and dose administration.

The test substance formulations were weight/volume (test substance/vehicle) mixtures. For the test substance-treated groups, the appropriate amount of the test substance for each group was weighed into a glass container. Vehicle was added to each container to bring the formulations nearly to the calibration mark. The formulations were mixed until uniform using a magnetic stirrer. Additional vehicle was added to each container to bring the formulations to the calibration mark, and the formulations were further mixed until uniform. Linuron formulations were also homogenized at 6500 rpm for approximately 5 minutes using a Silverson LMRT No.1 homogenizer.

The test substance formulations were prepared approximately weekly as single formulations for each dosage level, divided into aliquots for daily dispensation and stored refrigerated in amber glass containers. The time aliquots were removed from the refrigerator was documented, and aliquots were stirred at room temperature for at least 45 minutes prior to dose administration. The test substance formulations were stirred continuously throughout the preparation, sampling and dose administration procedures.

Test substance formulations prepared prior to the treatment period were visually inspected by the study director on 18 October 2005, and were found to be visibly homogeneous and acceptable for dose administration.

4.1.4. ADMINISTRATION

Dose administration was performed blind to treatment group by assigning each group a letter designation. The test and vehicle control substance formulations were administered orally by gavage, via an appropriately sized flexible, Teflon®-shafted, stainless steel ball-tipped dosing cannula (Natume, Japan) once daily at approximately the same time each day (0710 hours to 0939 hours until the day of necropsy and 0606 hours to 0630 hours on the day of necropsy) for 15 consecutive days (Test Days 1 through 15), through the day of scheduled necropsy. The dosage volume for all groups was 5 mL/kg/day. Individual dosages were based on the most recently recorded body weights, with the following exception. Individual dosages on the last day of dose administration were based on the body weight from the previous day. On the last day of dose administration, the animals were dosed across groups, so that 1 animal was dosed in each group prior to dose administration the second animal in each group (e.g., the first animal in Group 1 followed by the first animal in Group 2, etc.). Necropsies were then performed in this order. Therefore, dose administration, blood collection and euthanasia were, in general, performed across groups in the same order such that effects of time and stress on these endpoints (particularly hormone measurements) were minimized to the extent possible. On 8 November 2005, the blood collection and euthanasia of 4 animals

in the 100 mg/kg/day phenobarbital group were not performed in the same order as dose administration.

The following table presents the study group assignment:

Group Number	Letter Code	Test Substance	Dosage Level (mg/kg/day)	Dosage Concentration (mg/mL)	Dosage Volume (mL/kg)	Number of Males
1	A	0.25% Methylcellulose	0	0	5	15
2	B	Linuron	50	10	5	15
3	C	Linuron	100	20	5	15
4	D	Linuron	150	30	5	15
5	E	Phenobarbital	25	5	5	15
6	F	Phenobarbital	50	10	5	15
7	G	Phenobarbital	100	20	5	15

Test substances were selected by the Sponsor to represent 2 different modes of action (antiandrogen and thyroid disruption). Each of the test substances has previously been evaluated in the adult male assay with results published (O'Connor et al., 2002b; 2002c; Sloan et al., 2005). Based on the results of the O'Connor studies, the high dosage level was not expected to exceed the maximally tolerated dose. The lower dosage levels were selected to assess dose-response relationships.

The selected route of administration was oral (gavage) as this is a biologically relevant potential route of exposure to environmental chemicals with endocrine-modulating potential. The animal model, the Crl:CD®(SD) rat, is recognized as appropriate on the basis of extensive experience with this strain and its suitability with respect to sensitivity to endocrine modulators.

4.1.5. SAMPLING AND ANALYSES

Prior to the initiation of dose administration (Test Day 1), quadruplicate samples, 2 for homogeneity and concentration determinations and 2 for possible future analyses, were collected from the top, middle and bottom strata of the vehicle and the formulations for the 50, 100 and 150 mg/kg/day linuron and 25, 50 and 100 mg/kg/day phenobarbital

groups. In addition, quadruplicate samples, 2 for resuspension homogeneity and stability determinations and 2 for possible future analyses, were collected from the top and bottom strata of the last dosing aliquot from the first formulation, which had been stored refrigerated for 13 days.

All analyses were conducted by the Analytical Chemistry Department, WIL Research Laboratories, LLC. The methodology and results of these analyses are presented in Appendix C, and the results are summarized in Section 6.1.

4.2. ANIMAL RECEIPT AND QUARANTINE

One hundred-twenty male Crl:CD®(SD) rats were received in good health from Charles River Laboratories, Raleigh, North Carolina, on 18 October 2005. The animals were approximately 66 days old at receipt. Each animal was examined by a qualified technician on the day of receipt and weighed on the following day. Animals were uniquely identified by Monel® metal eartags displaying the permanent identification number. All animals were housed for a 6-day quarantine period. During this period, each animal was observed twice daily for mortality and general changes in appearance or behavior.

4.3. ANIMAL HOUSING

Upon arrival, all animals were housed individually in clean, wire-mesh cages suspended above cage-board, which was changed at least 3 times each week. Animals were maintained in accordance with the *Guide for the Care and Use of Laboratory Animals* (National Research Council, 1996). The animal facilities at WIL Research Laboratories, LLC, are accredited by the Association for Assessment and Accreditation of Laboratory Animal Care International (AAALAC International).

4.4. DIET, DRINKING WATER AND MAINTENANCE

The basal diet used in this study, Teklad 2018 diet (low phytoestrogen), is a certified feed with appropriate analyses performed by the manufacturer and provided to WIL Research Laboratories, LLC. The results of the feed lot analysis are presented in Appendix D. The

batch of feed used in this study (lot no. 082605MA) had a total genistein-equivalent content (aglycone) of approximately 155.1 ppm. Feeders were changed and sanitized once per week. Municipal water supplying the facility is sampled for contaminants according to the standard operating procedures. No contaminants were thought to be present in animal feed or water at concentrations sufficient to interfere with the objectives of this study. The results of the drinking water analysis are presented in Appendix D. Reverse-osmosis-treated (on-site) drinking water, delivered by an automatic watering system, and the basal diet were provided *ad libitum* throughout the study.

4.5. ENVIRONMENTAL CONDITIONS

All animals were housed throughout the quarantine period and during the study in an environmentally controlled room. The room temperature and humidity controls were set to maintain daily averages of 71°F ± 5°F (22°C ± 3°C) and 50% ± 20% relative humidity. Room temperature and relative humidity were monitored using the Metasys® DDC Electronic Environmental control system and were recorded approximately hourly. These data are summarized in Appendix E. Actual mean daily temperature ranged from 70.4°F to 71.3°F (21.3°C to 21.9°C) and mean daily relative humidity ranged from 39.3% to 56.3% during the study. Light timers were set to provide a 12-hour light (0600 hours to 1800 hours)/12-hour dark photoperiod. Air handling units were set to provide a minimum of 10 fresh air changes per hour.

4.6. ASSIGNMENT OF ANIMALS TO STUDY GROUPS

On 21 October 2005 (3 days prior to the initiation of dose administration), all available rats were weighed, examined in detail for physical abnormalities and released for study by a laboratory veterinarian. The animals judged suitable for assignment to the study were assigned to 1 of 7 (blinded) groups at random using the WIL Toxicology Data Management System (WTDMS™) computer program, which randomized the animals based on stratification of the pretest body weights in a block design so that no statistical differences among group body weight means were present. Therefore, the experimental design for WIL-431014 consisted of 6 test substance-treated groups (2 test substances at

3 dosage levels each) and 1 vehicle control group composed of 15 males each. The selected animals were approximately 72 days old at the initiation of dose administration; body weights ranged from 286 g to 359 g on the first day of dose administration.

5. PARAMETERS EVALUATED

All in-life and postmortem activities, with the exception of tissue fixation, processing and pathological evaluation, were conducted blind to treatment and treatment group.

5.1. CLINICAL OBSERVATIONS AND SURVIVAL

The animals were observed twice daily, once in the morning and once in the afternoon, for mortality and moribundity. A detailed physical examination was conducted on the day of randomization and daily prior to dose administration except on Test Day 15. On Test Day 15, a detailed physical examination was conducted 13 minutes to 26 minutes following dose administration. All animals were also observed for signs of toxicity approximately 6 hours following dose administration on Test Days 1-14. All significant findings were recorded at these observation periods.

5.2. BODY WEIGHTS

Individual body weights were recorded daily prior to dose administration on Test Days 1 through 14. On the last day of dose administration (Test Day 15), body weights were collected following dose administration. Mean body weights and mean body weight changes were calculated for the corresponding intervals and for Test Days 1-8, 8-15 and 1-15.

5.3. FOOD CONSUMPTION

Individual food consumption was recorded on Test Days 1, 8 and 15. Food intake was calculated as g/kg/day for the corresponding intervals and for Test Days 1-15.

5.4. MACROSCOPIC EXAMINATION

Gross necropsies were performed on animals found dead and euthanized in extremis. Moribund animals were euthanized by carbon dioxide inhalation. Tissues were preserved in 10% neutral-buffered formalin for possible future histopathological examination only as indicated by the gross findings.

On Test Day 15, all surviving animals were euthanized by exposure to carbon dioxide (up to 60 seconds) followed by decapitation. Rapid euthanasia was necessary because of the likelihood that undue stress associated with anesthesia alone would interfere with the accurate measurement of the various hormones that are essential endpoints with this assay (Holson, 1992). Stress-induced changes in hormone levels related to cage transport were also minimized by delaying euthanasia for 1 hour after moving the animals to the necropsy holding room. All surviving animals were euthanized by 1101 hours to minimize variability associated with serum hormone measurements, and the time of euthanasia was recorded. In order to ensure that euthanasia would occur between 0800 hours and 1101 hours, the start of dose administration (Test Day 1) was staggered over 3 calendar days (approximately 1/3 of all animals started each day); consequently, the last dose administration/necropsies (Test Day 15) were staggered over 3 days. A complete necropsy was conducted on all animals starting approximately 1 hour 54 minutes following dose administration, and the order of necropsy was stratified across all groups and corresponded to the order in which the animals were dosed on that day, with the following exception. On 8 November 2005, the blood collection and euthanasia of 4 animals in the 100 mg/kg/day phenobarbital group were not performed in the same order as dose administration.

The necropsy included the external surface, all orifices, the external surface of the brain and the thoracic, abdominal and pelvic cavities, including viscera. Selected organs and tissues were weighed and preserved for all animals as described in Sections 5.6. and 5.7. Other tissues were preserved in 10% neutral-buffered formalin for possible future histopathological examination only as indicated by the gross findings.

5.5. HORMONE ANALYSES

Immediately following euthanasia, trunk blood (approximately 10 mL) was collected for serum hormone evaluations from all animals at the scheduled necropsy. The blood samples were placed on ice. Serum was isolated by centrifugation (at 4°C for approximately 10 minutes) and divided into aliquots. Serum was stored at approximately

-70°C until hormone analyses were performed. The Metabolism Department, WIL Research Laboratories, LLC conducted all hormone analyses by radioimmunoassay (RIA) procedures, with each serum sample run in duplicate. Hormone analyses methods, procedures, performance and references are presented in Appendix F. The following hormones were analyzed in the order in which they are presented:

1. Testosterone (T)
2. Luteinizing Hormone (LH)
3. Thyroid-Stimulating Hormone (TSH)
4. Thyroxine (T_4)
5. Triiodothyronine (T_3)
6. Follicle-Stimulating Hormone (FSH)
7. Estradiol (E2)
8. Prolactin (PRL)
9. Dihydrotestosterone (DHT)

5.6. TISSUE COLLECTION AND ORGAN WEIGHTS

The following organs from all animals euthanized at the scheduled termination on Test Day 15 were weighed to the nearest 0.1 mg:

Epididymides[a]	Seminal vesicles with fluid and coagulating gland[a]
Liver	Testes[b]
Prostate (ventral and dorsolateral)	Thyroid[c,d]

[a] = These paired organs were weighed together.
[b] = These paired organs were weighted separately.
[c] = Includes parathyroid glands; designated as "Thyroid Glands" on all tables.
[d] = Weighed after fixation in 10% neutral-buffered formalin.

To minimize systematic bias, organ harvesting procedures, with the exception of those related to thyroid trimming (see Section 5.7.), were divided as equally as possible among the prosecting technicians, such that all animals from a group were not processed by a single individual, and weighing procedures were performed by 1 technician. Ratios of organ weight relative to final body weight were calculated for each organ and for the paired testes (the summation of the left and right testis weights) and the accessory sex gland unit (the summation of the prostate and seminal vesicles with fluid and coagulating gland).

5.7. TISSUE FIXATION AND PROCESSING AND MICROSCOPIC EVALUATION

The testes were placed in Bouin's fixative for approximately 24 hours, after which they were rinsed and stored in 70% alcohol until histological processing. The epididymides and liver from each animal were placed in 10% neutral-buffered formalin. The thyroid, with attached trachea, was fixed in 10% neutral-buffered formalin for at least 48 hours. Then, the thyroid was dissected from the trachea, blotted, weighed to the nearest 0.1 mg and subsequently placed in 10% neutral-buffered formalin until histological processing. The fixed thyroid dissection was performed by a single individual in order to reduce the variability of the dissection procedure and the variability of the thyroid weights due to differences.

The testes, epididymides and the thyroid from animals in the control, 100 mg/kg/day phenobarbital and 150 mg/kg/day linuron groups were then embedded in paraffin, sectioned and stained with hematoxylin and eosin (H&E) for subsequent histological evaluations. Sections of 5 microns were made for the testis (transverse) and for the epididymis (longitudinal).

Microscopic examination was performed on the testes, epididymides and thyroid from all animals in the control, 150 mg/kg/day linuron and 100 mg/kg/day phenobarbital groups. For the thyroid microscopic examination, 3 sections of the paired lobes were examined microscopically for each animal. Thyroid epithelial height and colloid area were graded on a 5 point scale in which (1) was the least and (5) the greatest. There was great variability in the microscopic appearance of the thyroid follicles in some animals, both within an individual section of thyroid and between sections of the same lobe. In general, when variability was noted, follicles toward the center of the thyroid lobes were given greater emphasis than those follicles at the periphery of the lobe, and sections of thyroid that were closer to the center of the lobe were given greater emphasis than those sections that were obtained closer to the periphery. Other microscopic changes were also recorded when present.

5.8. STATISTICAL METHODS

All statistical tests were performed using appropriate computing devices or programs. Analyses were conducted using two-tailed tests (except as noted otherwise) for minimum significance levels of 5% and 0.6%, comparing each test substance-treated group to the control group. Each mean was presented with the standard deviation (S.D.), (Appendices G, H and I only), standard error of the mean (S.E.) and the number of animals (N) used to calculate the mean. Tables 2-9 also present the coefficient of variation, the difference of the mean from the control group mean with ±1 S.E. and the mean as a percent of the control group mean with the S.E. Due to the different rounding conventions inherent in the types of software used, the means and standard deviations on the summary and individual tables in Appendices H and I may differ by ±1 in the last significant figure.

Using untransformed data, outlier screens were carried out prior to analysis (separately for each endpoint) following Grubbs analysis (1969) and an evaluation of normal probability plots. Tests for heterogeneity of variance were carried out on the data (excluding the values identified as potential outliers) using a one-way analysis of variance model fitted to the data.

Test Day 15 body weight, body weight change during Test Days 1-8, 8-15 and 1-15, food consumption during Test Days 1-8, 8-15 and 1-15, absolute organ weights, organ weights relative to final body weights and hormone data were subjected to a one-way analysis of variance (ANOVA) model that was fitted to the data to estimate treatment effects. The factors in the ANOVA models included treatment and residual [replicate (treatment)]. Linear trend statistics were compared to 0 trend by means of one-sample t-tests. A detailed description of the statistics is presented in Appendix G.

5.9. DATA RETENTION

The sponsor has title to all documentation records, raw data, specimens or other work product generated during the performance of the study. All work product generated by

WIL Research Laboratories, LLC, including raw paper data and specimens, is retained in the Archives at WIL Research Laboratories, LLC, as specified in the study protocol. Data generated by Battelle Memorial Institute will be archived by the sponsor or the sponsor's designee.

Reserve samples of the test and vehicle control substances, pertinent electronic storage media and the original final report are retained in the Archives at WIL Research Laboratories, LLC, in compliance with regulatory requirements.

6. RESULTS

6.1. ANALYTICAL CHEMISTRY

Appendix C

Linuron and phenobarbital homogeneity and concentration, as well as resuspension homogeneity and stability following 13 days of refrigerated storage, met protocol or WIL standard operating procedure (SOP) acceptance criteria. This acceptance criteria consists of the following: homogeneity (percentage difference across strata of ≤5%, concentration within 10% of the target concentration), resuspension homogeneity (relative standard deviation of ≤10%) and stability (concentration values ≥90% of corresponding initial values). Dosing formulations analyzed for test article concentration met the protocol requirement for acceptability.

6.2. LINURON

6.2.1. CLINICAL OBSERVATIONS AND SURVIVAL

Appendices H and I

Male no. 97223 in the 150 mg/kg/day linuron group was euthanized in extremis on Test Day 6 due to a 20% loss of its initial body weight and clinical observations of red material around the nose, prostration and body cool to touch. The latter finding, in addition to impaired mobility (also noted 3 days prior to euthanasia), lying on side with limbs extended, hypoactivity and red material around the eyes, was noted approximately 6 hours following dose administration on the day of euthanasia. Rocks, lurches or sways while walking was also noted for this male approximately 6 hours following dose administration 2 days prior to euthanasia.

A test substance-related effect on the clinical condition of the animals in the 100 and 150 mg/kg/day dosage groups was noted. During daily clinical observations (prior to dose administration), increased incidences of decreased defecation and hair loss on the hindlimbs and abdominal, thoracic, urogenital, anogenital and/or rump areas were observed in the 100 and 150 mg/kg/day groups throughout the period of dose

administration. In addition, red material around mouth, nose and/or eyes at the daily clinical examinations was noted in the 150 mg/kg/day group generally during the first week of dose administration. Throughout the study, impaired mobility, piloerection, hypoactivity and rocks, lurches or sways while walking and lying on side with limbs extended were observed approximately 6 hours following dose administration in the 150 mg/kg/day group animals that survived to necropsy.

6.2.2. BODY WEIGHTS

Tables 1 and 2, Figures 1, 3, 4, 5 and 6 and Appendices H and I

Statistically significant mean body weight losses and decreased body weight gains were observed in all linuron-treated groups between Test Days 1 and 8 compared to controls (10.4%, 15.9% and 17.9% decreased mean body weight on Test Day 8 in the 50, 100 and 150 mg/kg/day groups, respectively, compared to the control group). Statistically significant body weight losses and decreased body weight gain persisted into the second week of treatment for the 100 and 150 mg/kg/day groups. Consequently, there were dose-dependent, statistically significant decreases in body weight change between Test Days 1 and 15 (17 g, -10 g and -19 g for the 50, 100 and 150 mg/kg/day linuron groups, respectively, compared to 56 g for the control group). The changes in body weight over the course of the study resulted in 10%, 17% and 20 % decreases (statistically significant) in final body weight in the 50, 100 and 150 mg/kg/day groups, respectively, compared to control. More specifically, 4 of 15, 7 of 15 and 13 of 14 animals in the 50, 100 and 150 mg/kg/day groups, respectively, exhibited a >15% decrease in final body weight compared to the vehicle control group mean final body weight.

6.2.3. FOOD CONSUMPTION

Tables 1 and 2, Figures 7, 8 and 9 and Appendices H and I

Consistent with the effects on body weight, food consumption (g/kg/day) was statistically significantly decreased in a dose-dependent manner in all linuron-treated groups for the first week of treatment and in the 100 and 150 mg/kg/day dosage groups during the

second week of treatment. Mean daily food consumption between Test Days 1 and 15 was 65 g/kg/day, 55 g/kg/day and 50 g/kg/day in the 50, 100 and 150 mg/kg/day groups, respectively, compared to 72 g/kg/day in the control group (all statistically significant).

6.2.4. MACROSCOPIC EXAMINATION

Appendices H and I

The animal euthanized in extremis on Test Day 6 had no findings at necropsy.

Gross necropsy findings in the linuron-treated groups included 2, 4 and 3 animals in the 50, 100 and 150 mg/kg/day linuron groups, respectively, observed with small seminal vesicles. One of these small seminal vesicles in the 100 mg/kg/day group was also soft (no. 97193); this animal also had a small prostate. The other macroscopic findings (dilated kidney pelvis and white areas on spleen) occurred in single animals, were not dose-responsive and/or were considered to be spontaneous and/or incidental in nature and unrelated to the test substance.

6.2.5. HORMONE ANALYSES

Tables 1, 6 and 8, Figures 28-36 and Appendices H and I

Although the radioimmunoassay kit controls and independent quality controls were not always “as-expected”, the low intra-assay variability across assays allowed for acceptable determination of test substance-related changes relative to the control group despite a few uncertainties regarding the absolute numbers calculated and presented (see Appendix F for assay-specific details).

Multiple changes in mean reproductive hormone levels were observed in the linuron-treated groups, although most were not statistically significant. Statistically significantly increased mean follicle-stimulating hormone and estradiol (when outliers were excluded from the statistical analysis) were observed in all linuron-treated groups; the results of the trend tests were statistically significant, but the increases in mean follicle-stimulating hormone and estradiol were not observed in a dose-related manner.

Slight numerical but biologically relevant decreases in mean testosterone and prolactin at 150 mg/kg/day and in mean dihydrotestosterone at 50 and 150 mg/kg/day were also observed. The decrease in mean prolactin at 150 mg/kg/day was statistically significant when outliers were excluded from the statistical analysis. Both testosterone and dihydrotestosterone in the 150 mg/kg/day group were slightly but not statistically significantly lower than controls in this study (33% and 24% lower than controls, respectively). Mean luteinizing hormone was similar to controls for all linuron groups. Except for the absence of change in luteinizing hormone and significantly increased follicle-stimulating hormone, the spectrum of changes in reproductive hormones in this study is similar to those reported previously for linuron at these dosages (O'Connor et al., 2002c).

Mean thyroid hormone concentrations were affected by linuron treatment. Statistically significant decreases in mean T4 were observed at all tested dosages and in mean T3 at 100 and 150 mg/kg/day, while mean TSH was numerically decreased (not statistically significant) in the 100 and 150 mg/kg/day groups. However, there were no correlating histopathologic changes in the thyroid or biologically meaningful changes in mean absolute or relative thyroid weights. Similar changes in thyroid hormones without changes in thyroid weights or histopathology have been previously reported in linuron-treated rats where it was postulated that these hormonal changes were secondary to liver enzyme induction, based on increased relative liver weights (O'Connor et al., 2002c). Mean relative liver weights were also statistically significantly increased in the current study. Decreased thyroid hormone levels may also be secondary to decreased body weight, as was noted by O'Connor and colleagues (1999 and 2000). Without supportive changes in other thyroid parameters, the relationship of decreased T3, T4 and thyroid-stimulating hormone to linuron administration is uncertain.

6.2.6. ORGAN WEIGHTS

Tables 1 and 4, Figures 10-27 and Appendices H and I

Multiple test substance-related changes were observed in organ weights in the linuron-treated animals. Mean final body weights were statistically significantly decreased in a dose-related manner across all groups. Mean absolute liver weights were also decreased in all groups. The decreased mean absolute liver weights in the 50 and 100 mg/kg/day groups were considered secondary to body weight decreases, but were statistically significant in the 150 mg/kg/day group only. Mean relative (to final body weight) liver weights were statistically significantly increased in all groups in a manner that was not dose-related. The similarity in the relative liver weights in the 100 and 150 mg/kg/day groups (4.115 g/100 g vs. 4.112 g/100 g) and the dose-related differences in final body weights in the 50, 100 and 150 mg/kg/day groups indicate that the increased relative liver weight in the 150 mg/kg/day group was test substance-related despite the decreased body weight. Increased relative liver weights have been reported and were suggested to be a result of liver enzyme induction (O'Connor et al., 2002c).

Mean absolute and mean relative thyroid weights were unaffected by test substance administration at all dosage levels of linuron. Although the differences from the control group in mean relative thyroid weights in the 100 and 150 mg/kg/day groups were statistically significant, they were not considered biologically relevant. Differences in mean relative thyroid weights between the control and 100 and 150 mg/kg/day groups of a previous study (O'Connor et al., 2002c) were of similar magnitude but were not statistically significant. In the current study, as well as in the O'Connor et al. study (2002c), these differences were observed in the absence of corresponding changes in thyroid histopathology (evaluated for the 150 mg/kg/day group only). Therefore, the slight increase in mean relative thyroid weights at 100 and 150 mg/kg/day were not considered test substance-related.

Test substance-related, statistically significant decreases in mean absolute prostate, seminal vesicle, and accessory sex gland weights were observed in all linuron-treated groups, although the decreases were not dose-related. Because the decreases in these mean absolute organ weights were likely affected by the 17% and 20% lower mean final body weights relative to the controls in the 100 and 150 mg/kg/day groups, respectively (O'Connor et al., 2000), the differences at these dosage levels were considered secondary to the lower final body weights. In contrast, the statistically significant decreases in mean absolute prostate, seminal vesicle and accessory sex gland weights in the 50 mg/kg/day group were considered related to the altered androgen status caused by the test article because these parameters have been shown to be sufficiently robust with a ≤10% decrease in final body weight relative to control (O'Connor et al., 2000). Mean relative weights of these organs were statistically significantly decreased only in the 100 mg/kg/day group. Therefore, the significance of the decreases in the mean relative weights of the prostate, seminal vesicle, and accessory sex gland was unclear due to the absence of effects at 150 mg/kg/day and the lack of a significant dose trend. Decreased mean relative accessory sex gland and prostate weights have been reported previously with linuron at 150 mg/kg/day (O'Connor et al., 2002c).

Mean individual and paired testis weights were unaffected by treatment. Absolute weight changes observed for the testis (individual and paired) in the 100 mg/kg/day group were not observed at the highest dosage and were not considered test substance-related. Mean relative testis weights (both individual and paired) were statistically significantly increased at all dosage levels; however these increases were considered artifacts of mean body weight decreases relative to the control group and not direct effects of linuron based on a previous study that reported similar changes in mean relative testis weights due to lower final body weights relative to the control group (O'Connor et al., 2000).

Mean epididymis weights were decreased at 100 and 150 mg/kg/day; the change was statistically significant at 100 mg/kg/day. At both dosage levels, mean relative epididymis weights were statistically significantly increased, likely as a result of

decreased mean final body weights compared to the control group. Increases in mean relative epididymis weights have been reported in rats with decreases in mean final body weight relative to the control similar to those observed in the current study (O'Connor et al., 2000). Additionally, there were no correlating microscopic changes observed in the epididymis of the 150 mg/kg/day animals.

6.2.7. MICROSCOPIC EXAMINATION

Appendices H and I

There were no definitive microscopic effects of oral administration of 150 mg/kg/day linuron to rats. One animal (no. 97161) showed multiple changes in the testis, including spermatid retention, giant cells, vacuolation of the seminiferous epithelium and decreased elongated spermatids. All changes were minimal but were observed in both testes. Whether the occurrence of this spectrum of changes in 1 animal in this study is related to the test substance is uncertain. The lesion, decreased elongating spermatids, was characterized by partial loss of elongating spermatids in the seminiferous epithelium, primarily in stages 12-14. Decreased elongated spermatids and spermatid retention can be induced by testosterone insufficiency (Creasy, 2002), and both mean testosterone and dihydrotestosterone in the 150 mg/kg/day group were slightly but not statistically significantly lower than controls in this study. The above indications are consistent with decreased testosterone and dihydrotestosterone, and a low incidence of spermatid retention (4 of 15 animals) previously reported in rats administered 150 mg/kg/day of linuron (O'Connor et al., 2002c). Giant cells and vacuolation of the seminiferous epithelium often are non-specific changes that can be observed as spontaneous lesions in control animals. Giant cells were observed in 1 other 150 mg/kg/day animal (no. 97207) in a single tubule. In both animals, these non-specific changes were considered incidental and unrelated to linuron administration.

Cellular luminal debris in the epididymis was observed in 3 animals (nos. 97161, 97207, 97174) in the 150 mg/kg/day group. This change in all animals was minimal and was

unilateral in 1 animal. Animal no. 97161 had testicular degeneration which correlated with the epididymal observation. Luminal debris was considered incidental in all 3 animals.

There were no test substance-related microscopic changes in the thyroid in the 150 mg/kg/day linuron group. Mean follicular height and colloid area were similar to controls, and no change in incidence of mitotic figures compared to controls was observed (see table below). All microscopic observations were considered incidental to treatment.

Diagnosis	vehicle control	150 mg/kg/day linuron
Follicular Epithelial Height (total)	15	14
Grade 1	0	2
Grade 2	6	7
Grade 3	9	2
Grade 4	0	3
Grade 5	0	0
Mean	**2.6**	**2.4**
Colloid Area (total)	15	14
Grade 1	1	2
Grade 2	6	3
Grade 3	8	5
Grade 4	0	4
Grade 5	0	0
Mean	**2.5**	**2.8**
Mitotic Figures (total)	5	3
Minimal	5	3
Mild	0	0

6.3. PHENOBARBITAL

6.3.1. CLINICAL OBSERVATIONS AND SURVIVAL

Appendices H and I

A 100 mg/kg/day phenobarbital animal was found dead on Test Day 4 (no. 97175); on the day prior to death, the animal was cool to touch, unconscious, unresponsive, exhibited lateral recumbency and had red material around the eyes and nose. This animal had lost

>10% of its initial body weight and approximately 6 hours following dose administration had exhibited impaired mobility, lying on side with limbs extended, lacrimation and shallow respiration.

In the animals that survived to necropsy, dried red material around both eyes and nose was observed frequently in more than half the 100 mg/kg/day group animals. In general, the onset of red material findings began on Test Day 3 and primarily lasted for 2-3 consecutive days. Impaired mobility, hypoactivity, lying on side with limbs extended and rocks, lurches or sways while walking were observed approximately 6 hours following dose administration in the majority of 100 mg/kg/day group animals. The occurrences of impaired mobility and lying on side with limbs extended began on Test Days 1 and 2, respectively, while the occurrences of hypoactivity and rocks, lurches or sways while walking generally began on Test Day 5 or later. All of these behavioral/central nervous system findings were noted throughout the period of dose administration.

6.3.2. BODY WEIGHTS

Tables 1 and 3, Figures 2, 3, 4, 5 and 6, and Appendices H and I

During the first week of dose administration (Test Days 1 to 8, mean body weight gain in the 100 mg/kg/day phenobarbital group (9 g) was statistically significantly decreased compared to the control group value (32 g), resulting in a 6% decrease in mean body weight by Test Day 8 compared to the control group. Although the effect did not persist through the second week of dose administration, the mean body weight change was significantly decreased during the entire treatment period (Test Days 1 to 15); this was attributed to the effect during the first week of dose administration. Mean body weight gains in the 25 and 50 mg/kg/day groups were similar to the control group values throughout the study. Mean body weights on Test Day 15 were 388 g, 387 g, 381 g and 369 g in the control, 25, 50 and 100 mg/kg/day groups, respectively; the 5% decrease in

mean body weight relative to the control group value in the 100 mg/kg/day group on Test Day 15 (final body weight) was statistically significant.

6.3.3. FOOD CONSUMPTION

Tables 1 and 3, Figures 7, 8 and 9 and Appendices H and I

Mean food consumption (g/kg/day) was slightly, but statistically significantly decreased in the 100 mg/kg/day phenobarbital group during the first week of treatment (Test Day 1 to 8); 71 g/kg/day compared to 76 g/kg/day in the control group. This is consistent with the significant body weight effect observed at this dosage. Mean daily food consumption was similar across groups during the second week of treatment and the mean daily food consumption for the study duration was similar across groups despite the effect observed during the first week.

6.3.4. MACROSCOPIC EXAMINATION

Appendices H and I

The animal found dead on Test Day 4 was observed with yellow matting on the skin, yellow stomach contents and a distended urinary bladder.

There were no phenobarbital-related macroscopic observations. Macroscopic findings noted (enlarged coagulating gland, small left testis and epididymis and enlarged spleen) occurred in single animals, were not dose-responsive and/or were considered to be spontaneous and/or incidental in nature and unrelated to the test substance.

6.3.5. HORMONE ANALYSES

Tables 7 and 9, Figures 28-36 and Appendices H and I

Although the radioimmunoassay kit controls and independent quality controls were not always “as-expected”, the low intra-assay variability across assays allowed for acceptable determination of test substance-related changes relative to the control group despite a few uncertainties regarding the absolute numbers calculated and presented (see Appendix F for assay-specific details).

Mean thyroid-stimulating hormone was significantly increased and mean total T3 and T4 were decreased in a dose-related manner at all dosage levels of phenobarbital. All changes were statistically significant except the mean T3 level at 25 mg/kg/day. These changes are consistent with the known mechanism of phenobarbital thyrotoxication (enhanced thyroid hormone excretion secondary to liver enzyme induction), and correlate with increased mean thyroid weights and histopathologic changes in the thyroid follicular epithelium and colloid.

Mean estradiol was statistically significantly increased and mean testosterone and dihydrotestosterone were statistically significantly decreased in the 50 and 100 mg/kg/day phenobarbital groups; the increase in mean estradiol at 50 mg/kg/day was statistically significant only when outliers were excluded from the statistical analysis. Mean testosterone and dihydrotestosterone were also slightly decreased in the 25 mg/kg/day phenobarbital group. The decreases in mean testosterone and dihydrotestosterone are consistent with the histopathological changes observed in these animals at 100 mg/kg/day (spermatid retention), which are consistent with androgen insufficiency. Similar changes have been reported in rats administered phenobarbital for 2 and 4 weeks (O'Connor et al., 1999; 2002b). Mean follicle-stimulating hormone levels were statistically significantly decreased in the 25 and 50 mg/kg/day phenobarbital group and slightly decreased in the 100 mg/kg/day group (not significant, likely due to a high value in a single animal); the decreases in these hormone levels were considered test substance-related. Mean prolactin levels were slightly (not statistically significantly) decreased in the 25, 50 and 100 mg/kg/day phenobarbital group animals compared to the control values; however, these decreases were not considered test substance-related because they were not observed in a dose-related manner. No other statistically significant or test substance-related changes in serum hormone levels were observed.

6.3.6. ORGAN WEIGHTS

Tables 1 and 5, Figures 10-27 and Appendices H and I

Mean absolute and relative (to final body weight) liver and thyroid weights were statistically significantly increased at all dosage levels. Liver weight increases were dose-related. These organ weight increases are expected test substance-related changes with phenobarbital treatment. The increased thyroid weights correlated with the microscopic thyroid changes in the 100 mg/kg/day group (increased mitoses, increased follicular height and decreased colloid area) and with the altered thyroid-stimulating hormone, T3 and T4 levels at all dosages. There were no other test substance-related changes in organ weights in the phenobarbital groups; the other statistically significant difference from the control group (relative prostate weight at 50 mg/kg/day) was not observed in a dose-related manner.

6.3.7. MICROSCOPIC EXAMINATION

Appendices H and I

Test substance-related changes were observed in the thyroid of the 100 mg/kg/day phenobarbital group animals. In general, individual animal epithelial height grades were higher and colloid area grades were lower than the control group, resulting in an increased mean follicular epithelial height and decreased mean colloid area. Additionally, increased numbers of animals in the phenobarbital group showed mitotic figures in the follicular epithelium when compared to the control group. These changes for the phenobarbital group were considered test substance-related and are presented in the table below. Similar decreases in colloid have been reported in 2 and 4 week studies in male rats with phenobarbital at this dosage level (O'Connor et al., 1999). Additionally, in this same reported study, increased thyroid cell proliferation was detected using BrDU after 2 weeks of dose administration with 100 mg/kg/day phenobarbital. The increased mitotic activity in the phenobarbital-treated rats in the current study is consistent with the increased cell proliferation observed in the reported

study, and is consistent with increased mean thyroid weights, increased mean thyroid-stimulating hormone values and decreased mean T4 and T3 values for this group.

Diagnosis	**vehicle control**	**100 mg/kg/day phenobarbital**
Follicular Epithelial Height (total)	15	14
Grade 1	0	0
Grade 2	6	3
Grade 3	9	8
Grade 4	0	3
Grade 5	0	0
Mean	**2.6**	**3.0**
Colloid Area (total)	15	14
Grade 1	1	5
Grade 2	6	5
Grade 3	8	3
Grade 4	0	1
Grade 5	0	0
Mean	**2.5**	**2.0**
Mitotic Figures (total)	5	14
Minimal	5	8
Mild	0	6

Test substance-related spermatid retention was observed in the testes of 5 of 14 animals in the 100 mg/kg/day phenobarbital group. This change was characterized by retention of step 19 spermatids at the luminal surface beyond stage IX. Typically, mature spermatids are released at stage VIII or IX. In phenobarbital-treated animals, spermatid retention was also evidenced by occasional mature spermatids present at various levels within the seminiferous epithelium in stages X-XII, suggesting increased phagocytosis. Spermatid retention has been reported in rats dosed with 100 mg/kg/day phenobarbital orally for 15 days (O'Connor et al., 2002b). Spermatid retention can be induced by testosterone insufficiency (Creasy, 2002). In this study, mean dihydrotestosterone and testosterone levels in the 50 and 100 mg/kg/day phenobarbital group animals were statistically significantly lower than controls. Slight changes dihydrotestosterone levels have been previously reported in rats administered phenobarbital for 2-4 weeks (O'Connor et al., 1999; 2002b).

In the epididymis, increased mononuclear cell infiltrates were observed in the 100 mg/kg/day phenobarbital group compared to controls. Mononuclear cell infiltrates were observed as small aggregates, primarily of lymphocytes with lesser numbers of larger mononuclear cells, around vessels in the interstitium of the epididymis. Although the overall incidence of mononuclear infiltrates was similar in all groups examined, in the control group the infiltrates were usually focal, while in phenobarbital-treated animals, all animals had multifocal infiltrates. The occurrence of focal and multifocal lesions is presented in the following table.

Diagnosis	**vehicle control**	**100 mg/kg/day phenobarbital**
Mononuclear Cell Infiltrates (total)	12	14
Focal, minimal	8	0
Multifocal, minimal	4	14
Multifocal, mild	0	0

Other lesions observed in the testis and epididymis of the phenobarbital-treated animals were considered spontaneous. One animal in the 100 mg/kg/day phenobarbital group (no. 97145) showed degeneration of the seminiferous tubules, a nonspecific change in which the tubules showed decreased numbers of germ cells in the seminiferous epithelium, and vacuolation of the epithelium. Animal no. 97224, another 100 mg/kg/day phenobarbital group animal, also had minimal degeneration of the seminiferous tubules. These changes were considered spontaneous and incidental, as 1 animal in the control group also had seminiferous tubule degeneration. Cellular luminal debris in the epididymis was observed in 2 animals (nos. 97145 and 97120) in the 100 mg/kg/day phenobarbital group. The changes were minimal in both animals. Animal no. 97145 had testicular degeneration which correlated with the epididymal observation. Luminal debris was considered incidental in both animals.

7. DISCUSSION

The overall purpose of this study was to conduct and report results from a participating laboratory (WIL) to an interlaboratory validation effort to determine if similar results can be obtained among 3 different contract research laboratories using a similar protocol, test substances and dosage levels. A secondary purpose was to evaluate the observed results with linuron and phenobarbital from the current study in the context of previously conducted 15-Day Adult Intact Male Rat Bioassays.

Based on documentation in the study records, the analytical chemistry results and the absence of GLP deviations and adverse deviations from the protocol or the current WIL SOPs, the test substance formulations were considered to have been properly prepared and the study animals adequately exposed to the test substances as per protocol such that the assay was considered to reliably predict toxicity (both endocrine and general depending on the severity of the effects on body weights). The performance and outcome of all hormone analyses were considered acceptable for interpreting test substance-related differences from control based on the overall low variability and consistency of these radioimmunoassays.

Since many endocrine-dependent parameters can be affected by altered homeostasis (e.g., changes in body weight), a deliberate attempt was made to interpret endocrine-specific effects in the context of general toxicity based on available information in the peer-reviewed literature (e.g., O'Connor et al., 2000).

7.1. LINURON

Linuron is an herbicide with weak affinity for the androgen receptor (Lambright et al., 2000). There is also evidence that linuron may inhibit testosterone biosynthesis as well (Hotchkiss et al., 2004). Previous studies have shown that linuron exposure leads to a range of effects in male reproductive tissues, including testicular malformations and decreased reproductive organ weights (Gray et al., 1999; McIntyre at al., 2002).

In the current study, 4 of 15, 7 of 15 and 13 of 14 animals in the 50, 100 and 150 mg/kg/day linuron dosage groups, respectively, had a >15% decrease in final body weights relative to the vehicle control group mean (see following text table). For these animals, this marked effect on body weight likely resulted in some secondary changes in organ weights and hormones, depending on the specific tissue and hormone (O'Connor et al., 2000). In general, since 47% and 93% of the animals in the 100 and 150 mg/kg/day groups, respectively, had a >15% decrease in final body weight relative to the control group, these dosage levels were considered at or exceeding the maximally tolerated dose (MTD), recognizing that O'Connor et al. (2000) has demonstrated that some of the endpoints (in particular, organ weighs) measured in this assay are sufficiently robust in the presence of >15% decrease in final body weight relative to control values. Consistent with exceeding the MTD, there was 1 animal in the high dosage group euthanized in extremis on Test Day 6. In addition to the marked body weight loss and decreased mean body weight gain, mean food consumption was decreased in the dose-dependent, statistically significant manner between Test Days 1 and 15. There were also many test substance-related clinical observations noted in the 100 and 150 mg/kg/day groups prior to dose administration and/or 6 hours post-dose administration throughout the study (impaired mobility, piloerection, hypoactivity, decreased defecation, hair loss, red material around mouth, nose and eyes, rocks, lurches or sways while walking and lying on side with limbs extended).

Group Number	Treatment	Total Number in Group	≤10% Decrease in BW[a] (N) [≥349 g]	11-15% Decrease in BW[a] (N) [330 g - 348 g]	16-20% Decrease in BW[a] (N) [310 g - 329 g]	>20% Decrease in BW[a] (N) [<310 g]
2	50 mg/kg/day Linuron	15	7	4	4	-
3	100 mg/kg/day Linuron	15	2	6	1	6
4	150 mg/kg/day Linuron	14[b]	-	1	5	8

[a] = Final body weight relative to the mean control group final body weight.
[b] = Male no. 97223 was euthanized in extremis on Test Day 6 due to a 20% loss of its initial body weight.

In the context of the general toxicity observed in these animals, particularly at the 100 and 150 mg/kg/day dosage levels (e.g., decreased body weight and food consumption), endocrine-related changes consistent with inhibition of androgen action were observed. Although the ability to determine if the statistically significant decreases in mean absolute prostate, seminal vesicle and accessory sex gland weights in all linuron-treated groups are due to an altered androgen state is likely confounded by general toxicity in those animals with a 15% or greater decrease in final body weight (O'Connor et al., 2000), the following conclusions were made. The significant decreases in mean absolute prostate, seminal vesicle and accessory sex gland weights observed in the 50 mg/kg/day group were not necessarily considered secondary to the final body weight as only 4 of 15 animals had a >15% decrease in final body weight relative to the control group. Instead, these decreases may be due to the known endocrine activity of the test substance, while the decreases in mean absolute prostate, seminal vesicle and accessory sex gland weights in the 100 and 150 mg/kg/day groups were confounded by the decreased final body weights in these groups. In contrast, the statistically significant decreases in mean relative prostate, seminal vesicle and accessory sex gland weights at the middle linuron dosage (100 mg/kg/day) were not considered affected by the loss in body weight (O'Connor et al., 2000). However, because the decreases in the relative weights of these organs were not observed in a dose-related manner and no significant dose trend was observed, the significance of these decreased relative weights at 100 mg/kg/day was considered equivocal. The statistically significant trends in decreased absolute left testis and paired epididymides weights (with statistically significant reductions in absolute right, left and paired testes and paired epididymides weights only at the 100 mg/kg/day dosage) were not considered test substance-related because there were no statistically significant decreases in the corresponding absolute organ weights at the high dosage (150 mg/kg/day). In general, the changes in male reproductive organ weights observed in the current study are consistent with those reported previously at these dosages of linuron except for the significant accessory sex organ weight effects at 50 mg/kg/day (O'Connor et al., 2002c). In addition, most of the mean reproductive hormone levels in the current

study were consistent (T, DHT, E2 and PRL) with those observed in previous studies (see table below) although some were not (FSH and LH). Primarily, there were slight decreases, generally non-statistically significant in testosterone at 150 mg/kg/day, dihydrotestosterone at 50 and 150 mg/kg/day and prolactin at 150 mg/kg/day coupled with slight but statistically significant increases in estradiol and follicle-stimulating hormone at all dosage levels; estradiol, follicle stimulating hormone and prolactin had statistically significant linear trends. The statistical significance of the increases in estradiol and the linear trends in estradiol and prolactin were observed only when outliers were excluded from the analyses. The decreases in testosterone, dihydrotestosterone and prolactin may be confounded in those animals with >20% decrease in final body weight relative to the control group mean, as a >20% decrease in final body weight relative to controls has been shown to significantly decrease these hormones (O'Connor et al., 2000).

	T	DHT	E2	FSH	LH	PRL	TSH	T4	T3
Linuron (150 mg/kg) (O'Connor et al., 2002c)	↓	↓	↑	-	↓	↓	↓[a]	↓	↓
Linuron (150 mg/kg) (Current study)	↓[a]	↓[a]	↑[b]	↑	-	↓[b]	↓[a]	↓	↓

[a] = Not statistically significant, but change was considered biologically relevant
[b] = Statistically significant when outliers were excluded from the analysis; change considered biologically relevant

Mean T4 in all linuron treated groups and T3 in the 100 and 150 mg/kg/day groups were statistically significantly decreased, and mean thyroid-stimulating hormone was only numerically decreased in the 100 and 150 mg/kg/day groups. There were no correlating histopathologic changes in the thyroid or biologically significant changes in mean thyroid weights. Similar changes in thyroid hormones without biologically significant changes in thyroid weights or histopathology have been previously reported in linuron-treated rats, where it was postulated that these hormonal changes were secondary to liver enzyme induction based on increased relative liver weights (O'Connor et al., 2002c).

Additionally, previous diet-restriction studies have reported decreased T4 and T3 with a >15% decrease in final body weight compared to controls and decreased thyroid-stimulating hormone levels with a >20% decrease in final body weight compared to controls (O'Connor et al., 1999, O'Connor et al., 2000). Thus, considering the number of linuron-treated animals with >15% and >20% decreases in final body weight, it is likely that the body weight decreases alone in the linuron-treated groups had an impact on the thyroid hormone levels. It has been suggested that many chemicals that are not thyrotoxicants or endocrine modulators can transiently alter thyroid hormone homeostasis in rodents without long-term thyroid effects (O'Connor et al., 2002c). Without supportive and biologically relevant changes in thyroid weights or histopathology, the relationship of the decreased T3 and T4 to the administration of linuron is uncertain.

7.2. PHENOBARBITAL

Phenobarbital is a hepatic enzyme inducer that enhances the clearance of thyroid hormones (reviewed in Capen, 2001).

In the current study, 1 animal in the 100 mg/kg/day group was found dead on Test Day 4. The effects observed in this animal were slightly more severe, but in general, all 100 mg/kg/day phenobarbital-treated rats exhibited impaired mobility, hypoactivity, lying on side with limbs extended and rocks, lurches or sways while walking following dose administration throughout the study. Dried red material around nose and eyes generally on Test Days 3, 4 and/or 5 were also observed in this dosage group in most of the 100 mg/kg/day animals. Mean body weight gain and food consumption were statistically significantly decreased in the high dosage phenobarbital group between Test Days 1 and 8, resulting in statistically significantly reduced mean body weight gain between Test Days 1 and 15. This effect on body weight gain in the 100 mg/kg/day group resulted in a statistically significant decrease of 5% in mean body weight relative to the control group on Test Day 15, with the final body weights of only 2 animals in this group being greater than 10% lower than the control group mean (see following text table). In general, the mean body weight gain and food consumption in the 25 and 50 mg/kg/day phenobarbital

animals were similar to the control group animals for the duration of the study. Therefore, for these dosages of phenobarbital there was no discernible adverse impact on the ability to interpret endocrine changes based on decreased final body weights relative to the control group.

Group Number	Treatment	Total Number in Group	11-15% Increase in BW[a] (N) [428 g - 446 g]	≤10% Increase in BW[a] (N) [388 g - 427 g]	≤10% Decrease in BW[a] (N) [≥349 g]	11-15% Decrease in BW[a] (N) [330 g - 348 g]
5	25 mg/kg/day Phenobarbital	15	1	7	6	1
6	50 mg/kg/day Phenobarbital	15	-	5	10	-
7	100 mg/kg/day Phenobarbital	14[b]	-	3	9	2

[a] = Final body weight relative to the mean control group final body weight.
[b]= Male no. 97175 was found dead on Test Day 4 and had lost >10% of its initial body weight.

Consistent with the known mechanism of phenobarbital thyrotoxication, all phenobarbital-treated rats had decreased T3 and T4 levels and increased levels of thyroid-stimulating hormone and mean absolute and relative thyroid and liver weights; all differences from the control group were statistically significant except for the mean T3 level at 25 mg/kg/day. These changes correlated with microscopic thyroid changes in the 100 mg/kg/day group. These microscopic changes in the thyroid included increased follicular cell height, decreased colloid area and increased mitotic figures suggesting thyroid cell proliferation consistent with the increased thyroid weights.

Changes in reproductive hormones included slight but generally statistically significant decreases in follicle-stimulating hormone in all phenobarbital-treated animals, statistically significant decreases in testosterone and dihydrotestosterone and statistically significant increases in estradiol in the 50 (when outliers were excluded) and 100 mg/kg/day group animals and slight decreases in testosterone and dihydrotestosterone in the 25 mg/kg/day group animals. In general, the profile of hormone changes, particularly the thyroid hormones, was consistent with that observed previously with phenobarbital (see table below).

	T	DHT	E2	FSH	LH	PRL	TSH	T4	T3
Phenobarbital (100 mg/kg) (O'Connor et al., 2002b)	-	↓	-	-	↓	↓	↑	↓	↓
Phenobarbital (100 mg/kg) (Current study)	↓	↓	↑	↓[a]	-	-	↑	↓	↓
[a] = Not statistically significant, but change was considered biologically relevant									

Histopathological effects were observed in the testes and epididymides of rats treated with 100 mg/kg/day phenobarbital. Spermatid retention was observed in 5 of 14 animals, characterized by retention of step 19 spermatids at the luminal surface beyond stage IX. This has also been observed previously in rats dosed 2 weeks with 100 mg/kg/day phenobarbital (O'Connor et al., 2002b), and is consistent with testosterone insufficiency-induced spermatid retention (Creasy, 2002). Though not noted previously, increased multifocal mononuclear cell infiltrates were observed in the epididymides of 100 mg/kg/day phenobarbital rats compared to controls. The significance of this observation is uncertain.

8. CONCLUSIONS

The data presented in the current study supports validation of this screening assay for potential thyroid disruptors based on the full complement of endpoints utilized (organ weights, thyroid hormones and histopathology), but caution should be used when interpreting changes in thyroid hormones alone (e.g., antiandrogens). It has been suggested that endocrine effects of antiandrogens such as linuron (and other antiandrogens such as p,p'-DDE) are relatively insensitive to detection in adult intact male rats except at overtly toxic dosages (Gray et al., 2001). The interpretation of the linuron data in the current study may not lend itself to appropriately assess the presumed unique sensitivity of the endocrine system to antiandrogens in adult intact male rats due to the limited measurable effects that were not considered influenced by the general toxicity observed (e.g., decreased final body weight relative to the control group). When considered collectively, the results of this study were comparable to previous studies with these test substances at these dosage levels with a few notable exceptions, and were therefore considered suitable for interlaboratory comparisons for the purposes of validating this 15-Day Adult Intact Male Rat Assay.

9. KEY STUDY PERSONNEL AND REPORT SUBMISSION

Report Submitted By:

Christopher J. Bowman, PhD, DABT
Staff Toxicologist, Developmental and
Reproductive Toxicology
Study Director

12 MAY 2006
Date

Pathologist Of Record:

Karen S. Regan, DVM, DACVP, DABT
Consulting Pathologist

5 May 06
Date

Report Prepared By:

Erin E. Petruzzi, MS
Study Analyst

12 MAY 06
Date

Report Reviewed By:

Joelle D. Ibanes, DVM, DACVP
Senior Pathologist

12 May 06
Date

Mark D. Nemec, BS, DABT
Director, Developmental and
Reproductive Toxicology

5 May 2006
Date

Donald G. Stump, PhD, DABT
Associate Director, Developmental and
Reproductive Toxicology

10 May 2006
Date

Evelyn Tanchevski, BS
Group Supervisor, Study Analysis and Reports

12 May 2006
Date

KEY STUDY PERSONNEL AND REPORT SUBMISSION (CONTINUED)

Study Personnel:

Susan C. Haley, BS	Manager, Clinical Pathology
Sally A. Keets, AS	Senior Operations Manager, Vivarium
Carol A. Kopp, BS, LAT	Manager, Gross Pathology and Developmental Toxicology Laboratory
Theresa M. Rafeld	Group Manager, Formulations Laboratory
Michael A. Safron, AS, HT (ASCP)	Manager, Histology
Daniel W. Sved, PhD	Director, Metabolism and Analytical Chemistry
Bennett J. Varsho, BS, DABT	Operations Manager, Developmental, Reproductive and Neurotoxicology
Robert A. Wally, BS, RAC	Manager, Reporting and Regulatory Technical Services

10. QUALITY ASSURANCE UNIT STATEMENT

10.1. PHASES INSPECTED

Date(s) of Inspection(s)	Phase Inspected	Date(s) Findings Reported to Study Director	Date(s) Findings Reported to Management	Auditor(s)
30-Sep-2005, 03-Oct-2005	Protocol Review	03-Oct-2005	19-Nov-2005	K.Shaner
18-Oct-2005	Homogeneity Analysis of 18 October 2005 Dosing Formulations	18-Oct-2005	19-Nov-2005	E.Crawford
18-Oct-2005	Test Article Preparation	19-Oct-2005	19-Nov-2005	K.Dobbs
20-Oct-2005, 21-Oct-2005	Protocol Amendment I Review	21-Oct-2005	19-Nov-2005	K.Mentzer
24-Oct-2005	Test Article Administration	24-Oct-2005	19-Nov-2005	K.Dobbs
07-Nov-2005	Necropsy	07-Nov-2005	21-Dec-2005	K.Dobbs
15-Nov-2005, 16-Nov-2005	Study Records (I-1)	16-Nov-2005	21-Dec-2005	L.Rush
16-Nov-2005	Study Records (N-1)	16-Nov-2005	21-Dec-2005	L.Rush
17-Nov-2005, 22-Nov-2005	Study Records (Rx-1)	22-Nov-2005	21-Dec-2005	L.Rush
18-Nov-2005, 21-Nov-2005, 22-Nov-2005	Study Records (A-1, A-2, A-3)	23-Nov-2005	21-Dec-2005	L.Rush; N.Daniels
23-Nov-2005	Protocol Amendment II Review	23-Nov-2005	21-Dec-2005	K.Mentzer
02-Dec-2005, 05-Dec-2005	Study Records (C-1)	06-Dec-2005	27-Jan-2006	L.Rush
14-Dec-2005, 15-Dec-2005	Draft Report (Analytical Appendix)	15-Dec-2005	27-Jan-2006	N.Daniels; L.Rush
16-Dec-2005	Study Records (H-1)	16-Dec-2005	27-Jan-2006	L.Rush
16-Dec-2005	Study Records (P-1)	16-Dec-2005	27-Jan-2006	L.Rush
21-Dec-2005, 26-Dec-2005, 27-Dec-2005	Draft Report (excluding Analytical Appendix)	27-Dec-2005	27-Jan-2006	L.Rush
27-Dec-2005	Study Records (C-2)	27-Dec-2005	27-Jan-2006	L.Rush
28-Dec-2005	Study Records (N-1, Supplemental)	28-Dec-2005	27-Jan-2006	L.Rush
05-May-2006, 08-May-2006	Draft Report (Appendix F)	08-May-2006	12-May-2006	L.Rush

This study was inspected in accordance with the U.S. EPA Good Laboratory Practice Standards (40 CFR Parts 160 and 792), the OECD Principles of Good Laboratory Practice, the Japanese MAFF Good Laboratory Practice Standards, the standard operating procedures of WIL Research Laboratories, LLC, and the sponsor's protocol and protocol amendments with the following exceptions. The data located in Appendix A (Certificates of Analysis) were the responsibility of the manufacturer, and the data located in Appendices B (Analyses of Test Substances) and G (Statistical Analyses Summary), as well as Tables 1-9 and Figures 1-36, were the responsibility of the sponsor. Quality Assurance findings, derived from the inspections during the conduct of the study and from the inspections of the raw data and draft report, are documented and have been reported to the study director. A status report is submitted to management monthly.

The raw data and draft report were audited by the WIL Quality Assurance Unit prior to submission to the Sponsor to assure that the Final Report accurately describes the conduct and the findings of the study. Quality control (QC) and quality assurance (QA) procedures followed those outlined in the Quality Assurance Project Plan (QAPP) that was prepared for this study (Appendix J). This report accurately reflects the data generated during the study. The methods and procedures used in the study were those specified in the protocol, its amendments and the standard operating procedures of WIL Research Laboratories, LLC.

The raw data, the retention sample(s), if applicable, and the final report will be stored in the Archives at WIL Research Laboratories, LLC, or another location specified by the sponsor.

10.2. APPROVAL

This study was inspected according to the criteria discussed in Section 10.1.

Report Audited By:

Nancy J. Daniels — Date: 12 May 2006
Associate Compliance Specialist

Lori A. Rush, BS, LAT, RQAP-GLP — Date: 12 May 2006
Sponsor Specialist, Quality Assurance

Report Released By:

Heather L. Osborn, BS, RQAP-GLP — Date: 12 May 2006
Manager, Quality Assurance

Offsite Quality Assurance Statement

Printed: 1/10/2006 1:39:34 PM

Study Number: WA 5-15

This study was inspected by the Quality Assurance Unit and reports were submitted to the Study Director and Management as follows:

Phase Inspected	Inspection Date	Date Reported to Battelle Task Leader/Battelle Management	Date Reported to Offsite Study Director / Management
Audit study file	1/ 5/2006	1/ 5/2006	1/10/2006
Audit supplemental report	1/ 5/2006	1/ 5/2006	1/10/2006

Jerri Y Pollock for Kathy E Reed
Quality Assurance Unit

5/4/06
Date

11. REFERENCES

Capen, C.C. Toxic responses of the endocrine system, In: CD Klaassen, ed *Casarett and Doull's Toxicology: The Basic Science of Poisons*. New York, NY, McGraw-Hill Medical Publishing Division, **2001**, 6th ed, pp. 711-759.

Creasy, D.M.; Foster, P.M.D. Male reproductive system, In: WM Haschek, CG Rousseaux and MA Wallig, eds *Handbook of Toxicologic Pathology*. San Diego, CA, Academic Press, Inc, **2002**, Vol 2, 2nd ed, pp. 785-846.

Gray, L.E. Jr.; Wolf, C.; Lambright, C.; Mann, P.; Cooper, R.L.; Ostby, J. Administration of potentially antiandrogenic pesticides (procymidone, linuron, iprodione, chlozolinate, p,p'-DDE, and ketoconazole) and toxic substances (dibutyl- and diethylhexyl phthalate, PCB 169, and ethane dimethane sulphonate) during sexual differentiation produces diverse profiles of reproductive malformations in the male rat. *Toxicology and Industrial Health*, **1999**, *15*, 94-188.

Gray, L.E. Jr.; Ostby, J.; Furr, J.; Wolf, C.J.; Lambright, C.; Parks, L.; Veeramachaneni, D.N.; Wilson, V.; Price, M.; Hotchkiss, A.; Orlando, E.; Guillette, L. Effects of environmental antiandrogen on reproductive development in experimental animals. *Human Reproduction Update*, **2001**, *7*, 248-264.

Grubbs, F. Procedures for detecting outlying observations in samples. *Technometrics,* **1969,** *11*, 1-21.

Holson, R.R. Euthanasia by decapitation: evidence that this technique produces prompt, painless unconsciousness in laboratory rodents. *Neurotoxicology and Teratology*, **1992**, *14*, 253-257.

Hotchkiss, A.K.; Parks-Saldutti, L.G.; Ostby, J.S.; Lambright, C.; Furr, J.; Vandenbergh, J.G.; Gray, L.E. Jr. A mixture of the "antiandrogens" linuron and butyl benzyl phthalate alters sexual differentiation of the male rat in a cumulative fashion, *Biology of Reproduction*, **2004**, *71*, 1852-1861.

Lambright, C.; Ostby, J.; Bobseine, K.; Wilson, V.; Hotchkiss, A.K.; Mann, P.C.; Gray, L.E. Jr. Cellular and molecular mechanisms of action of linuron: an antiandrogenic herbicide that produces reproductive malformations in male rats, *Toxicological Sciences*, **2000**, *56*, 389-399.

McIntyre, B.S.; Barlow, N.J.; Foster, P.M.D. Male rats exposed to linuron in utero exhibit permanent changes in anogenital distance, nipple retention, and epididymal malformations that result in subsequent testicular atrophy, *Toxicological Sciences*, **2002**, *65*, 62-70.

National Research Council. *Guide for the Care and Use of Laboratory Animals*, Institute of Laboratory Animal Resources, Commission on Life Sciences; National Academy Press: Washington, DC, **1996**.

O'Connor, J.C.; Frame, S.R.; Davis, LG; Cook, JC. Detection of thyroid toxicants in a tier 1 screening battery and alterations in thyroid endpoints over 28 days of exposure. *Toxicological Sciences,* **1999**, *51*, 54-70.

O'Connor, J.C.; Davis, L.G.; Frame, S.R.; Cook, J.C. Evaluation of a Tier I screening battery for detecting endocrine-active compounds (EACs) using the positive controls testosterone, coumestrol, progesterone, and RU486. Toxicological Sciences, **2000**, *54*, 338-354.

O'Connor, J.C.; Cook, J.C.; Marty, M.S.; Davis, L.G.; Kaplan, A.M.; Carney, E.W. Evaluation of the Tier I screening options for detecting endocrine active compounds (EACs). *Critical Reviews in Toxicology*, **2002a**, *32*: 521-549.

O'Connor, J.C.; Frame, S.R.; Ladics, G.S. Evaluation of a 15-day screening assay using intact male rats for identifying antiandrogens. *Toxicological Sciences,* **2002c**, *69*, 92-108.

O'Connor, J.C.; Frame, S.R.; Ladics, G.S. Evaluation of a 15-day screening assay using intact male rats for identifying steroid biosynthesis inhibitors and thyroid modulators. *Toxicological Sciences,* **2002b**, *69*, 79-91.

Sloan, C; Tyl, R.W.; George, J.D.; Vick, K.D.; Pearce, S.W.; Hamby, B.T.; Myers, C.B.; Marr, M.C. 15-day Tier 1 screen of endocrine active compounds administered by gavage to adult male Sprague-Dawley® rats. RTI International. Research Triangle Park, NC. **2005**, Final Report 65U-08055.001.021.

12. DEVIATIONS FROM THE PROTOCOL

This study was conducted in accordance with the protocol and protocol amendments, except for the following.

- **Protocol Section 7.1** states that rats would be in quarantine for a minimum of 7 days. The actual quarantine period was 6 days.
- **Protocol Section 7.2** states that the release by the laboratory veterinarian of animals as suitable test subjects and the randomization of animals into test groups would occur at the end of the quarantine period. Animal release by the veterinarian and randomization occurred 3 days prior to the end of the quarantine period.
- **Protocol Section 7.4.3** states that lot no. 14601TC of formulated methylcellulose would be used as the vehicle control substance. Lot no. 062K0144 was actually used.
- **Protocol Section 7.6.1** states that detailed physical examinations would be conducted daily prior to dose administration except on Test Day 15. On Test Day 15, a detailed physical examination was conducted 13 minutes to 26 minutes following dose administration.
- **Protocol Sections 7.7** and **8.1** state that tissues with unusual gross findings would be preserved in 10% neutral-buffered formalin. The small prostate of animal no. 97193 (scheduled euthanasia) in the 100 mg/kg/day linuron group, the small seminal vesicles of animal no. 97128 (scheduled euthanasia) in the 150 mg/kg/day linuron group, and the distended urinary bladder of animal no. 97175 (found dead on Test Day 4) in the 100 mg/kg/day phenobarbital group were not saved.
- **Protocol Section 8.1** states that following dose administration on the morning of Test Day 15, animals would be moved to the necropsy holding room and held for at least 1 hour before euthanasia was to begin. The time of animal arrival to the holding room was not documented; therefore, the holding time of 1 hour could not be verified.
- **Protocol Section 8.1** states that animals would be necropsied for blood and tissue collection in the same order in which they were dosed. On 8 November 2005, male nos. 97160, 97177, 97182 and 97187 in the 100 mg/kg/day phenobarbital group were the 13th, 20th, 27th and 34th animals, respectively to be dosed, but were the seventh, 14th, 21st and 28th animals, respectively, to be euthanized and have blood collected.

- **Protocol Section 8.1** states that euthanasia would occur between 0800 hours and 1100 hours (2-3 hours following the final dose administration). Animal no. 97158 in the 100 mg/kg/day phenobarbital group was euthanized at 1101 hours. Euthanasia for animals at the scheduled necropsy occurred 1 hour 54 minutes to 4 hours 31 minutes after the final dose was administered. Specifically, 3, 3, 1, 0, 0, 0 and 0 animals in the control, 50, 100 and 150 mg/kg/day linuron and 25, 50 and 100 mg/kg/day phenobarbital groups were euthanized less than 2 hours following the final dose administration, and 6, 6, 8, 8, 9, 9 and 8 animals in the same respective groups were euthanized more than 3 hours following the final dose administration.

- **Protocol Section 8.3** states that sections of 2-4 microns for histopathological evaluation would be made from the testis and epididymis. Sections of 5 microns were made.

- **Protocol Section 9** states that that for quality control (QC) samples, the buffer/medium in which the standards were prepared would be spiked with respective QC hormones at concentrations that are expected to encompass 70% B/B_0 (±10%) and 30% B/B_0 (±10%). For TSH, FSH, PRL, and LH analyses, the B/B_0 ranges for different concentrations are in the kit manufacturer's (Amersham Life Science Ltd.) package insert. However, the concentrations of QC hormone added for these specific QC hormones on these respective assays were 10-fold lower than was needed to target the appropriate 70% B/B_0 and 30% B/B_0 due to a simple calculation error. One consequence of this miscalculation was that the assay results of the low concentration QC samples for these specific hormones were below the lowest standard on the standard curve.

- **Protocol Section 11** states that linear trend statistics would be evaluated using the means of two-sample t-tests. The linear trend statistics were compared to 0 trend by means of one-sample t-tests.

These deviations did not negatively impact the quality or integrity of the data nor the outcome of the study.

FIGURES 1-36

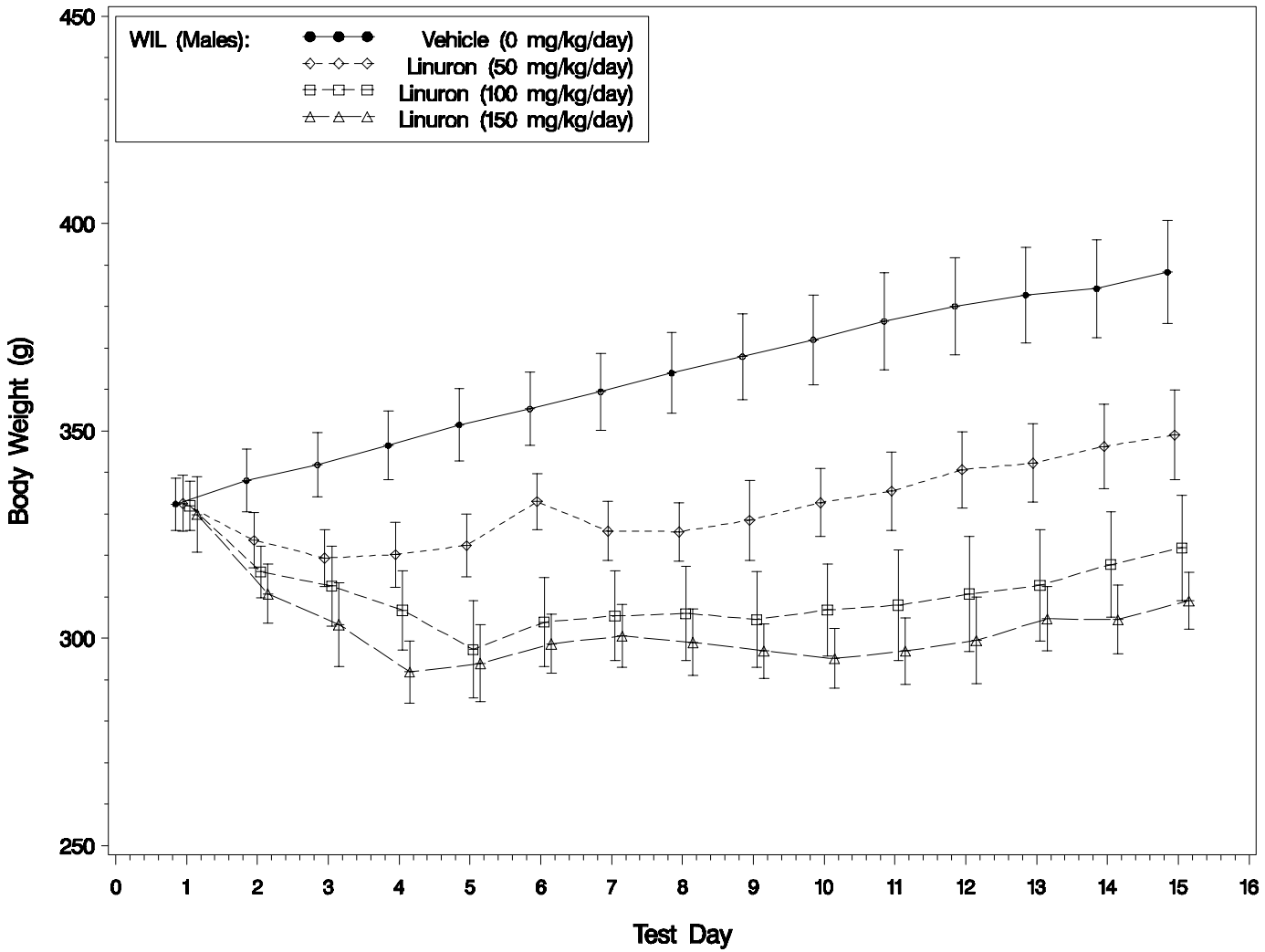


Figure 1. **<u>WIL Adult Males</u> Means (with ± 2 Standard Error Bars) of Body Weights (g) on Each Day from Test Day 1 to Test Day 15 for the Vehicle (0.25% methylcellulose) Group and the Three Linuron Dose Groups.**

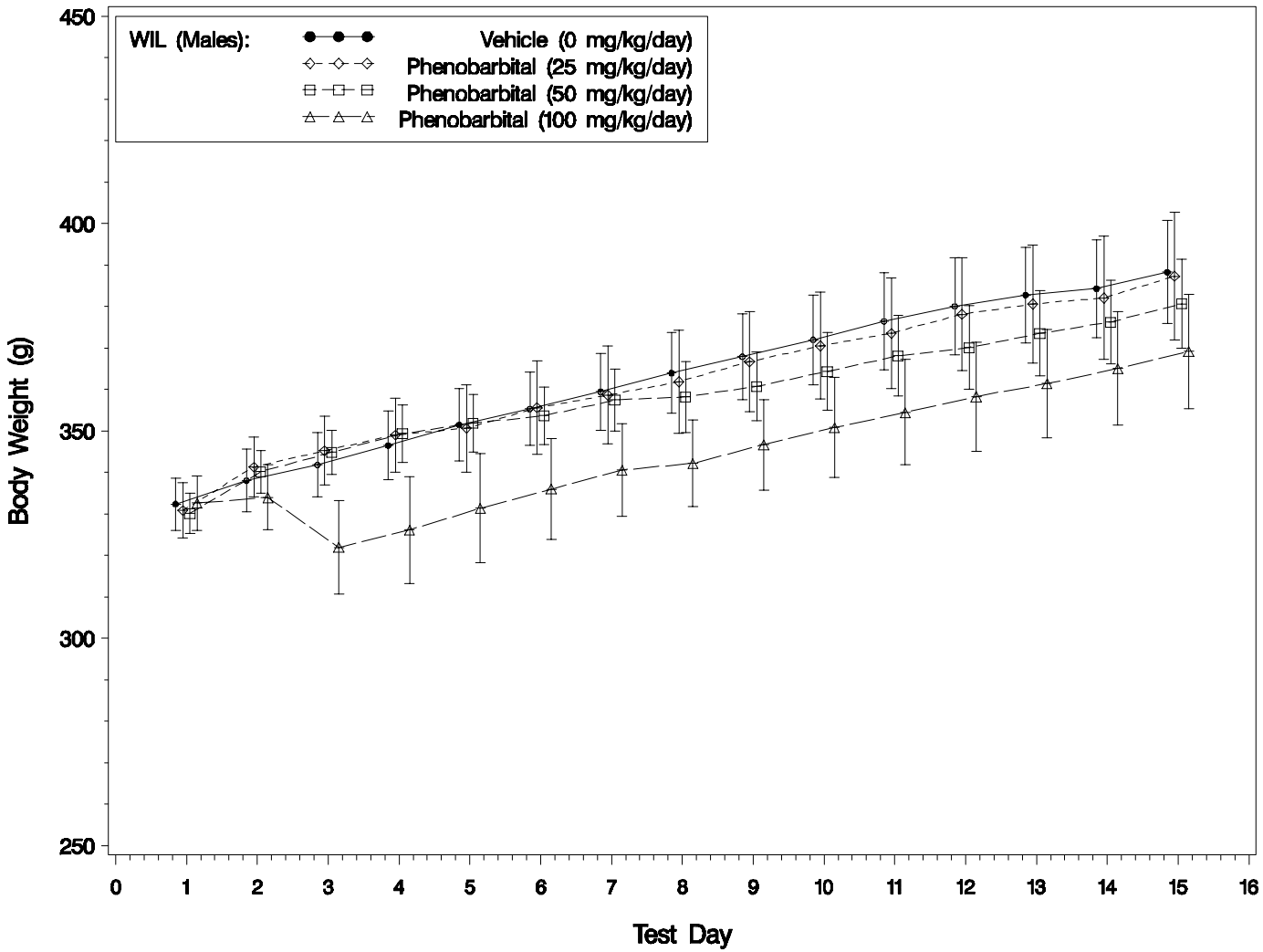


Figure 2. **<u>WIL Adult Males</u> Means (with ± 2 Standard Error Bars) of Body Weights (g) on Each Day from Test Day 1 through Test Day 15 for the Vehicle (0.25% methylcellulose) Group and the Three Phenobarbital Dose Groups.**

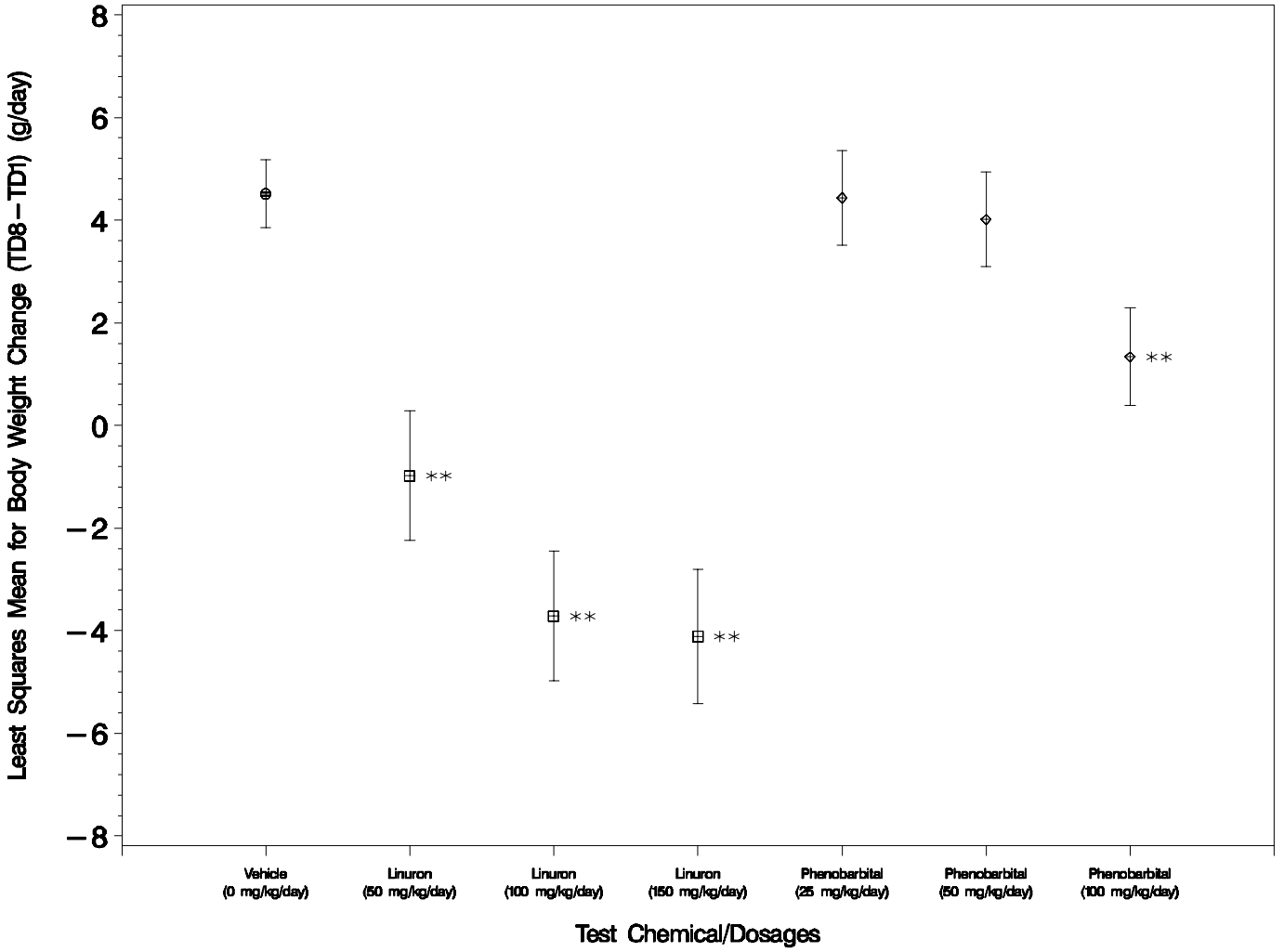


Figure 3. **<u>WIL Adult Males</u> Least Squares Means (with ± 2 Standard Error Bars) of Average Daily Body Weight Change (g/day) from Test Day 1 to Test Day 8 for Each Dose Group (Significant Differences from Vehicle Control are Indicated by "*" for the 0.05 Level, and by "**" for the 0.05/8 Level).**

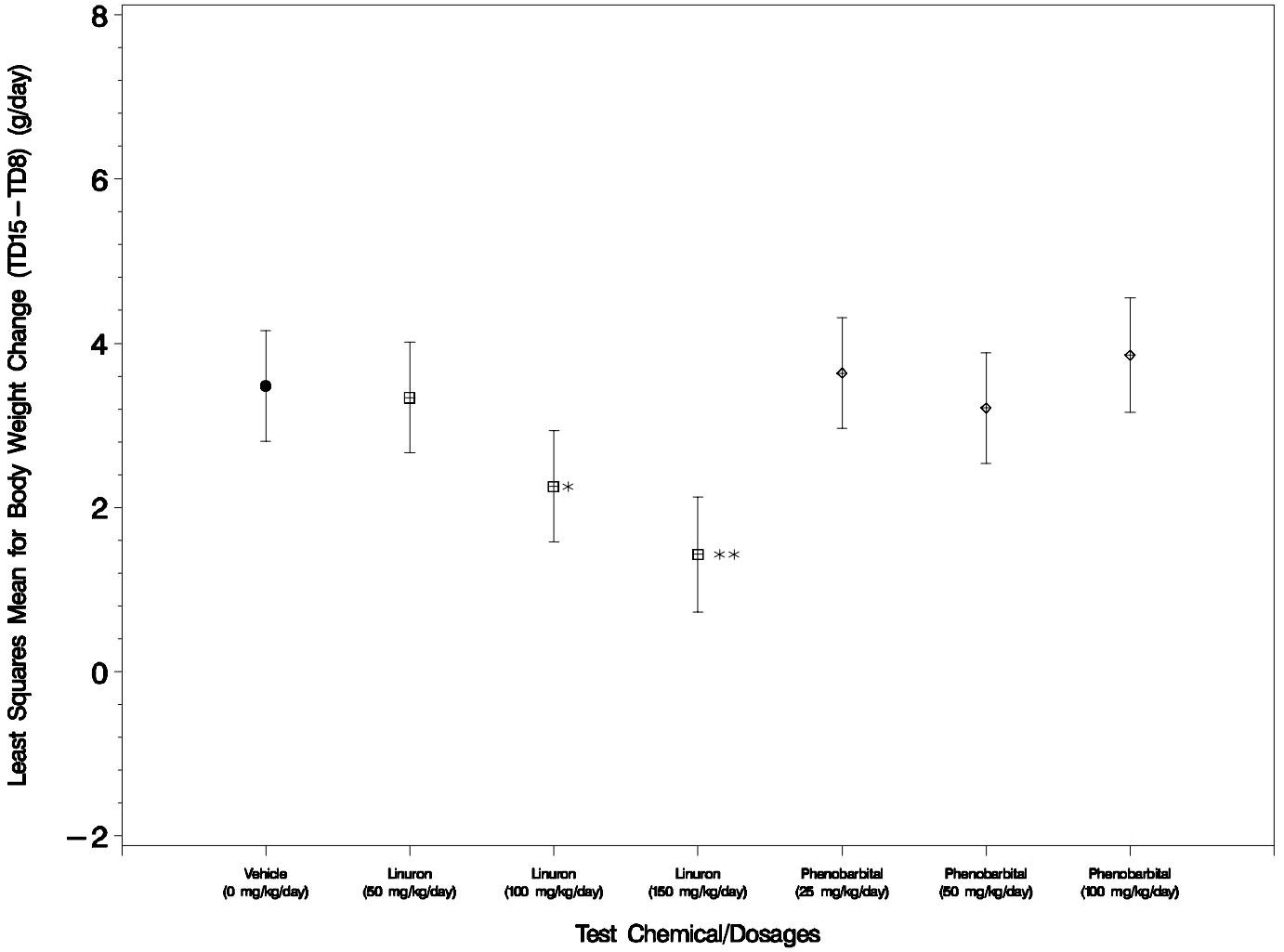


Figure 4. **<u>WIL Adult Males</u> Least Squares Means (with ± 2 Standard Error Bars) of Average Daily Body Weight Change (g/day) from Test Day 8 to Test Day 15 for Each Dose Group (Significant Differences from Vehicle Control are Indicated by "*" for the 0.05 Level, and by "**" for the 0.05/8 Level).**

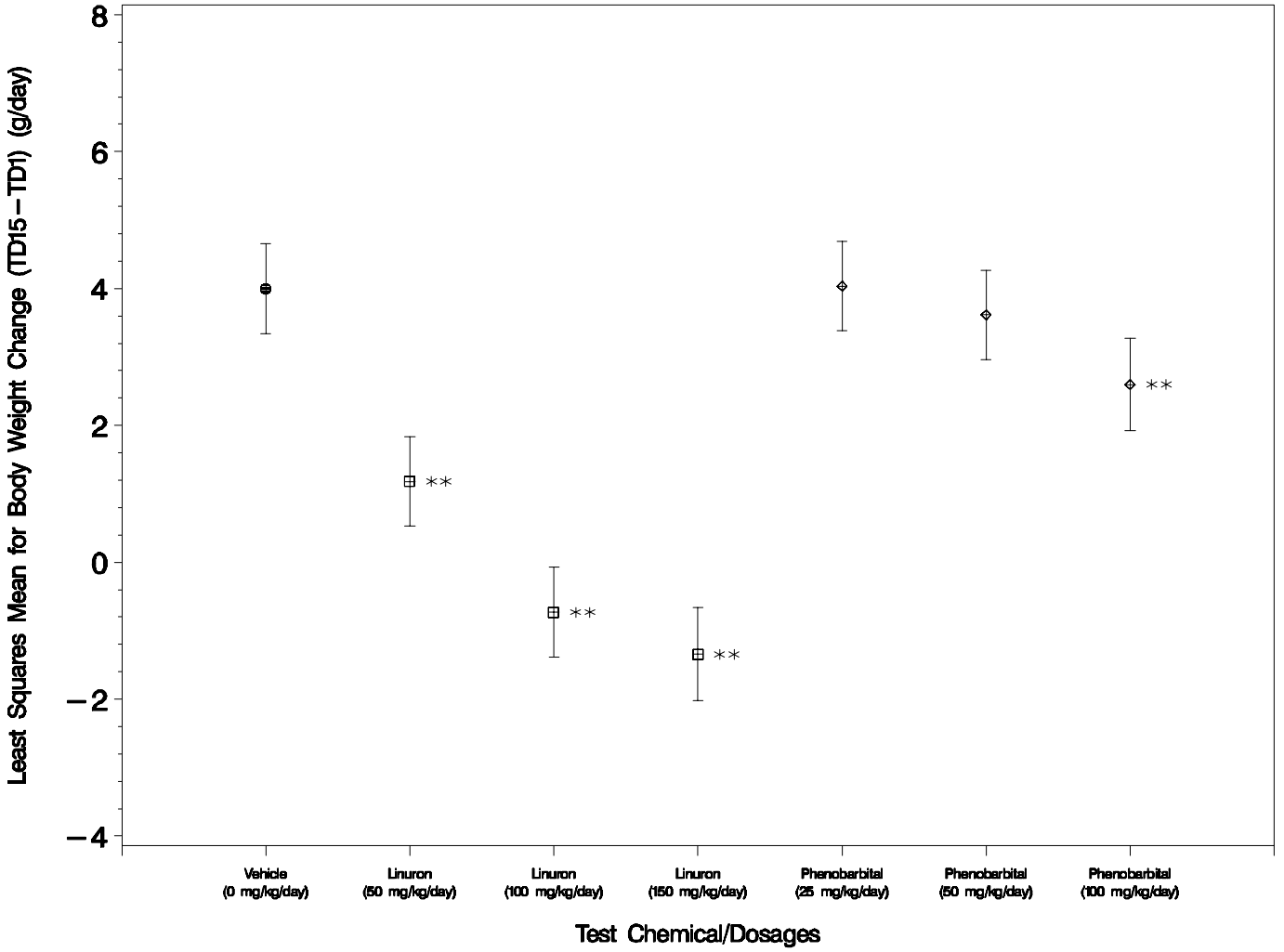


Figure 5. **<u>WIL Adult Males</u> Least Squares Means (with ± 2 Standard Error Bars) of Average Daily Body Weight Change (g/day) from Test Day 1 to Test Day 15 for Each Dose Group (Significant Differences from Vehicle Control are Indicated by "*" for the 0.05 Level, and by "**" for the 0.05/8 Level).**

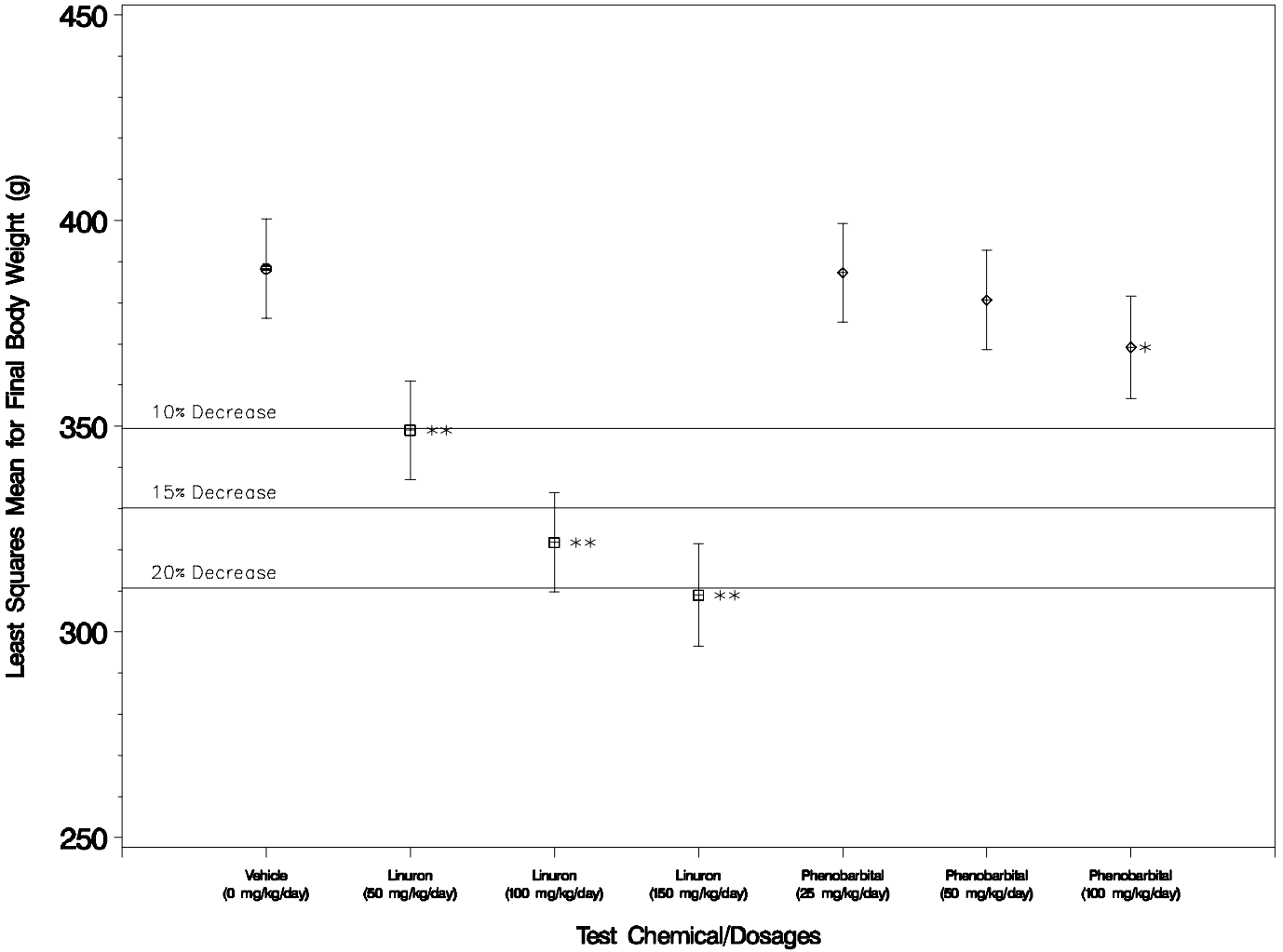


Figure 6. **<u>WIL Adult Males</u> Least Squares Means (with ± 2 Standard Error Bars) for Final Body Weight (g) (TD15) For Each Dose Group (Significant Differences from Vehicle Control are Indicated by "*" for the 0.05 Level, and by "**" for the 0.05/8 Level). The Horizontal Reference Lines Represent 10%, 15% and 20% Decrease in Final Body Weight Relative to Vehicle.**

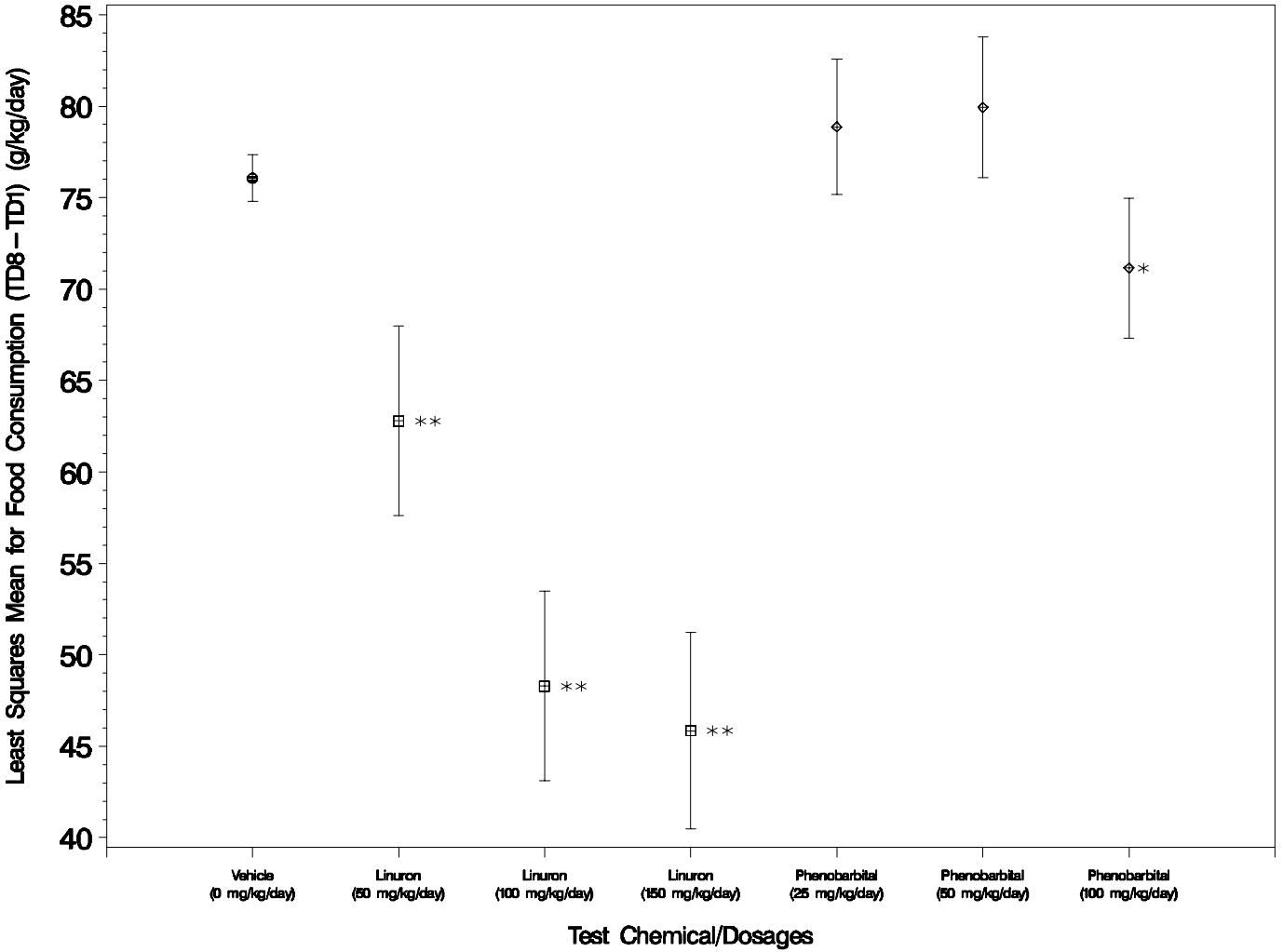


Figure 7. **<u>WIL Adult Males</u> Least Squares Means (with ± 2 Standard Error Bars) of Average Daily Food Consumption (g/kg/day) from Test Day 1 to Test Day 8 for Each Dose Group (Significant Differences from Vehicle Control are Indicated by "*" for the 0.05 Level, and by "**" for the 0.05/8 Level).**

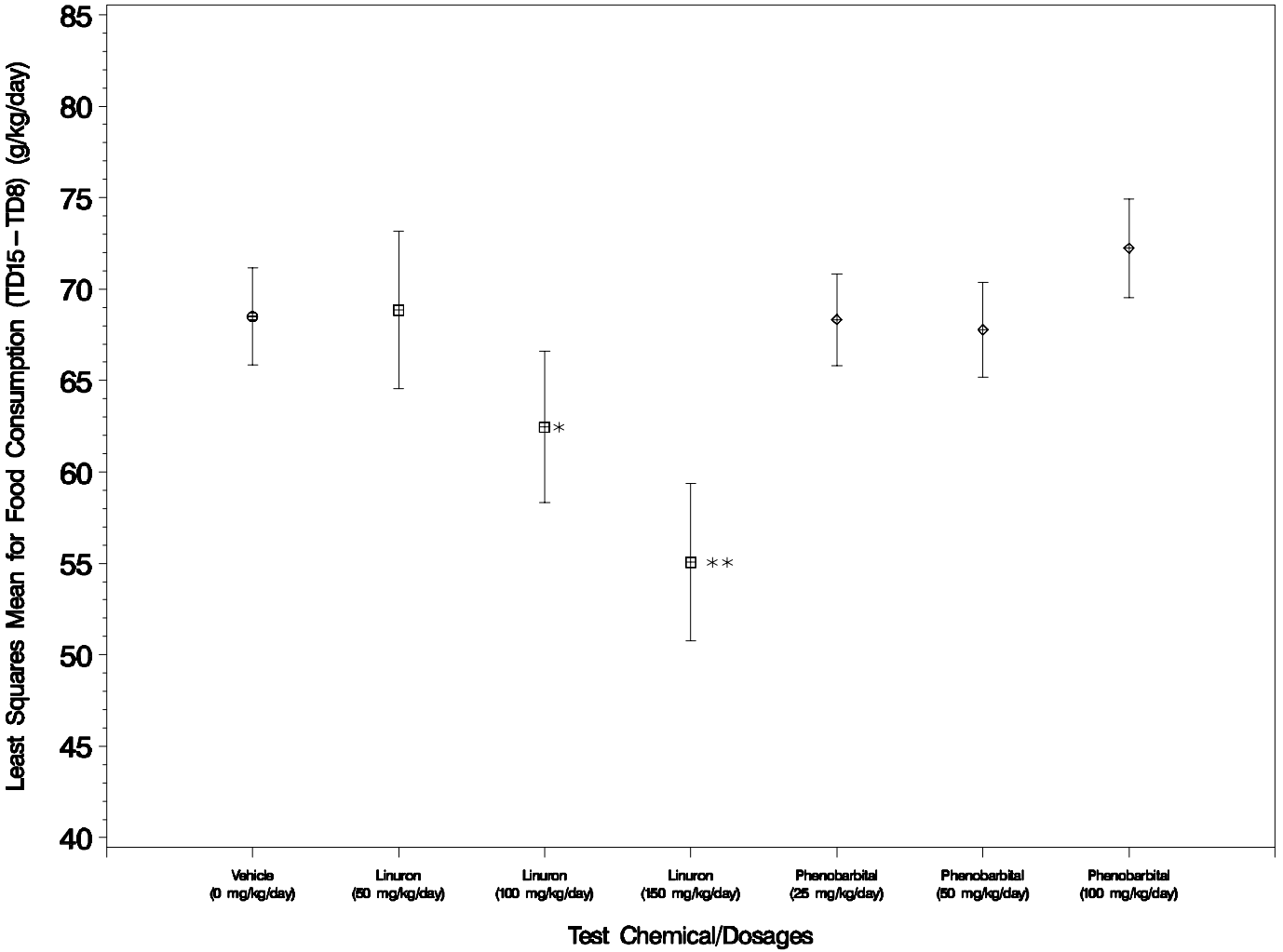


Figure 8. **<u>WIL Adult Males</u> Least Squares Means (with ± 2 Standard Error Bars) of Average Daily Food Consumption (g/kg/day) from Test Day 8 to Test Day 15 for Each Dose Group (Significant Differences from Vehicle Control are Indicated by "*" for the 0.05 Level, and by "**" for the 0.05/8 Level).**

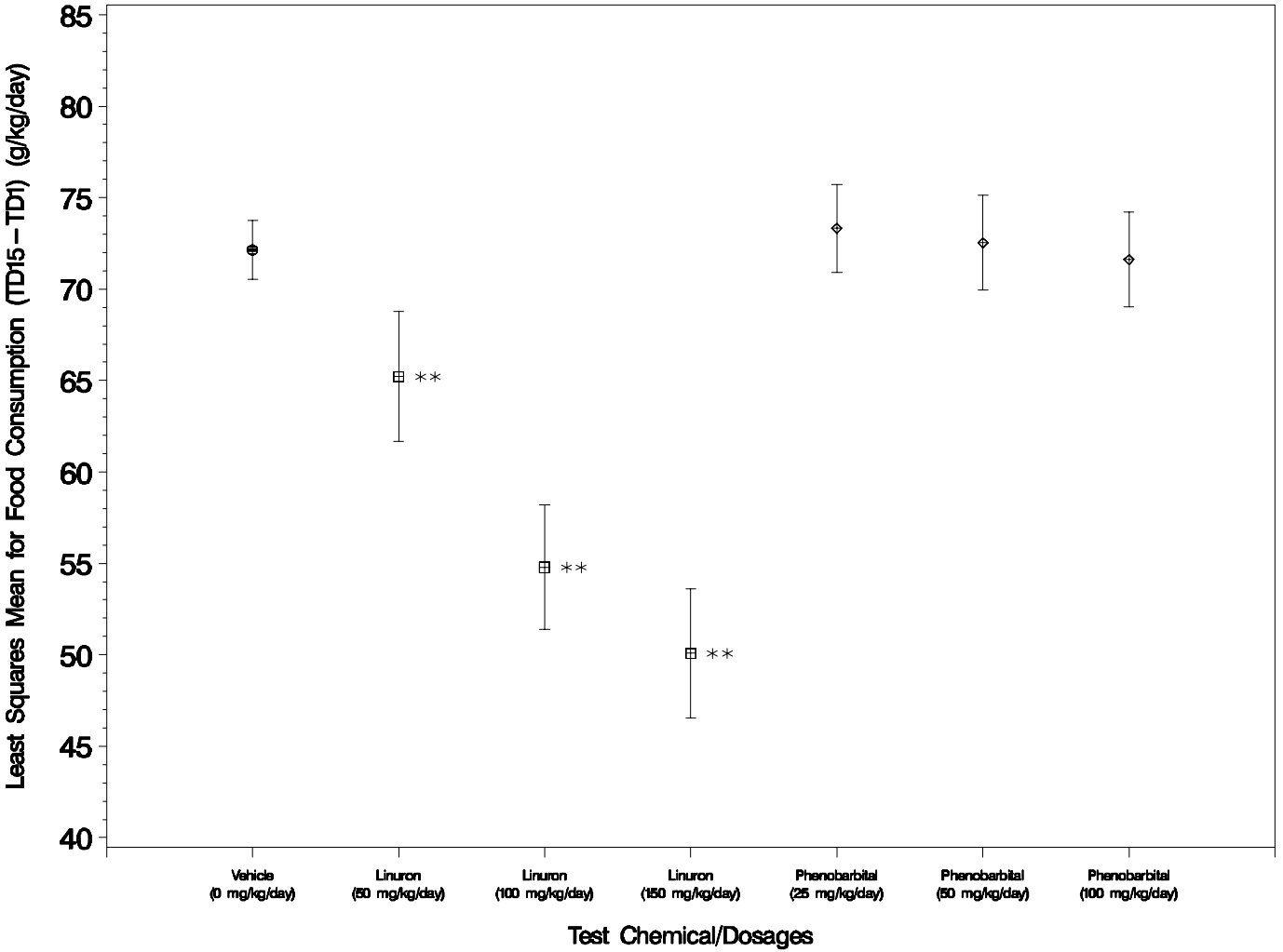


Figure 9. **<u>WIL Adult Males</u> Least Squares Means (with ± 2 Standard Error Bars) of Average Food Consumption (g/kg/day) from Test Day 1 to Test Day 15 for Each Dose Group (Significant Differences from Vehicle Control are Indicated by "*" for the 0.05 Level, and by "**" for the 0.05/8 Level).**

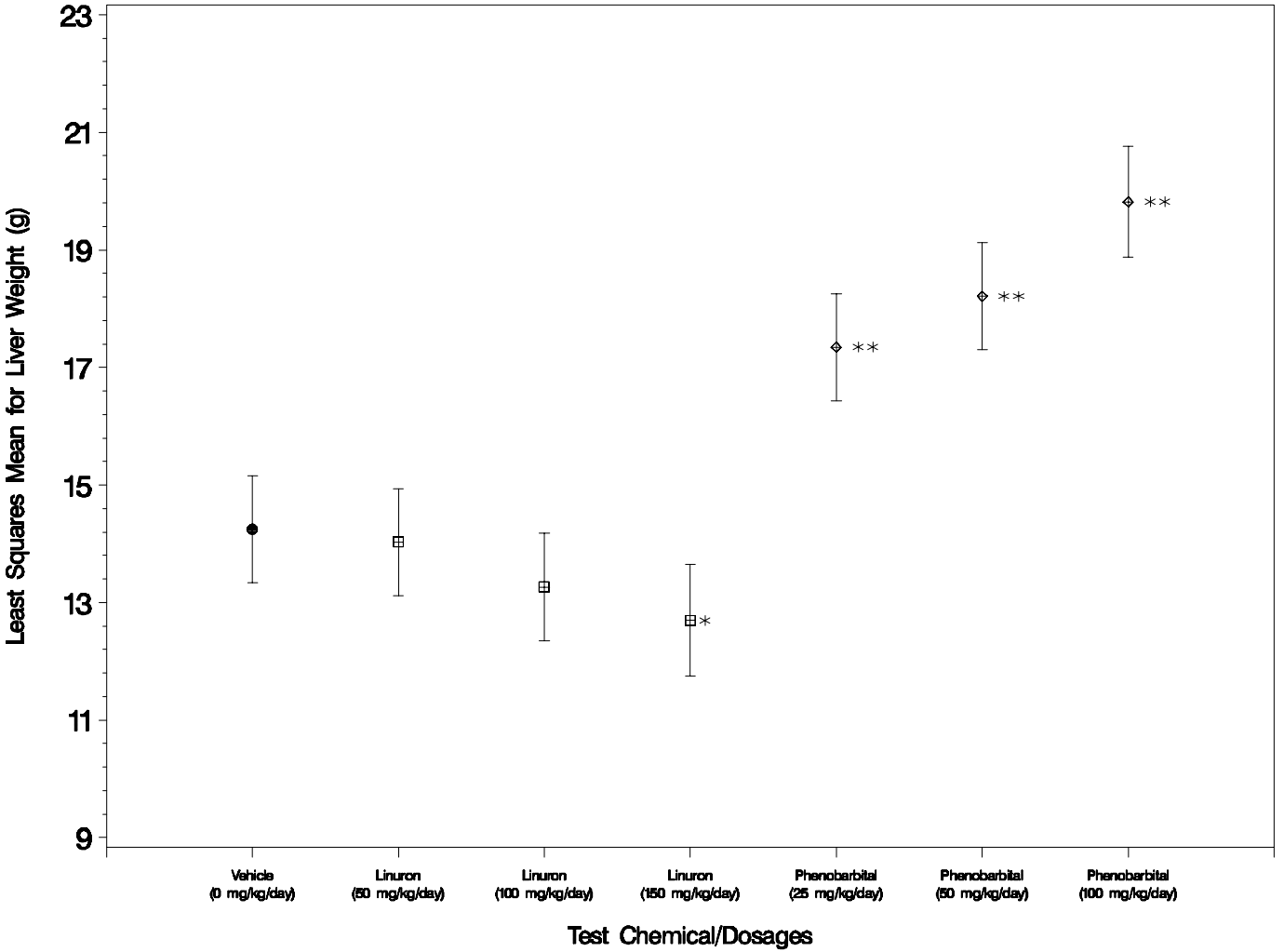


Figure 10. **<u>WIL Adult Males</u> Least Squares Means (with ± 2 Standard Error Bars) for Liver Weight (g) for Each Dose Group (Significant Differences from Vehicle Control are Indicated by "*" for the 0.05 Level, and by "**" for the 0.05/8 Level).**

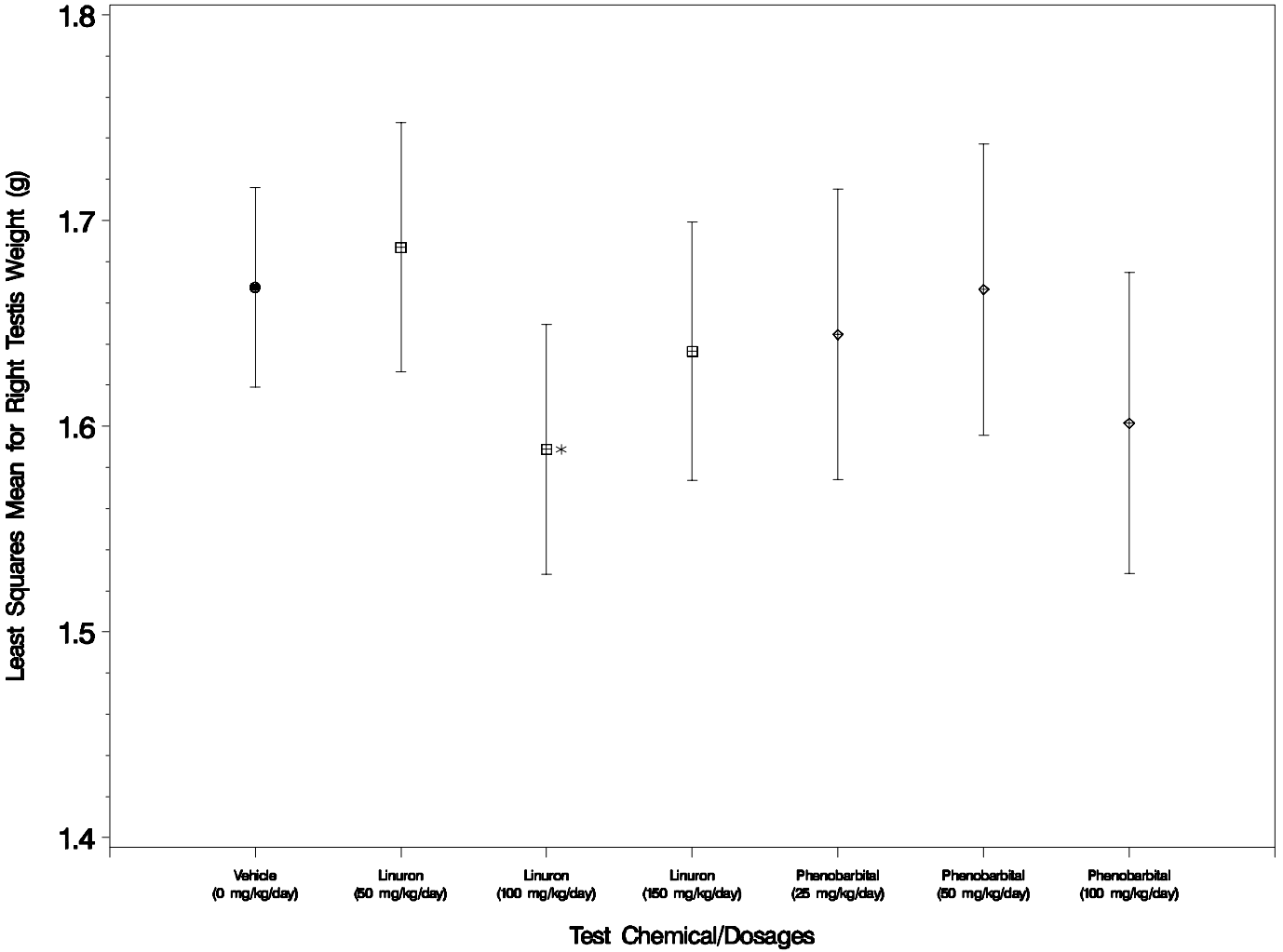


Figure 11. **<u>WIL Adult Males</u> Least Squares Means (with ± 2 Standard Error Bars) for Right Testis Weight (g) for Each Dose Group (Significant Differences from Vehicle Control are Indicated by "*" for the 0.05 Level, and by "**" for the 0.05/8 Level).**

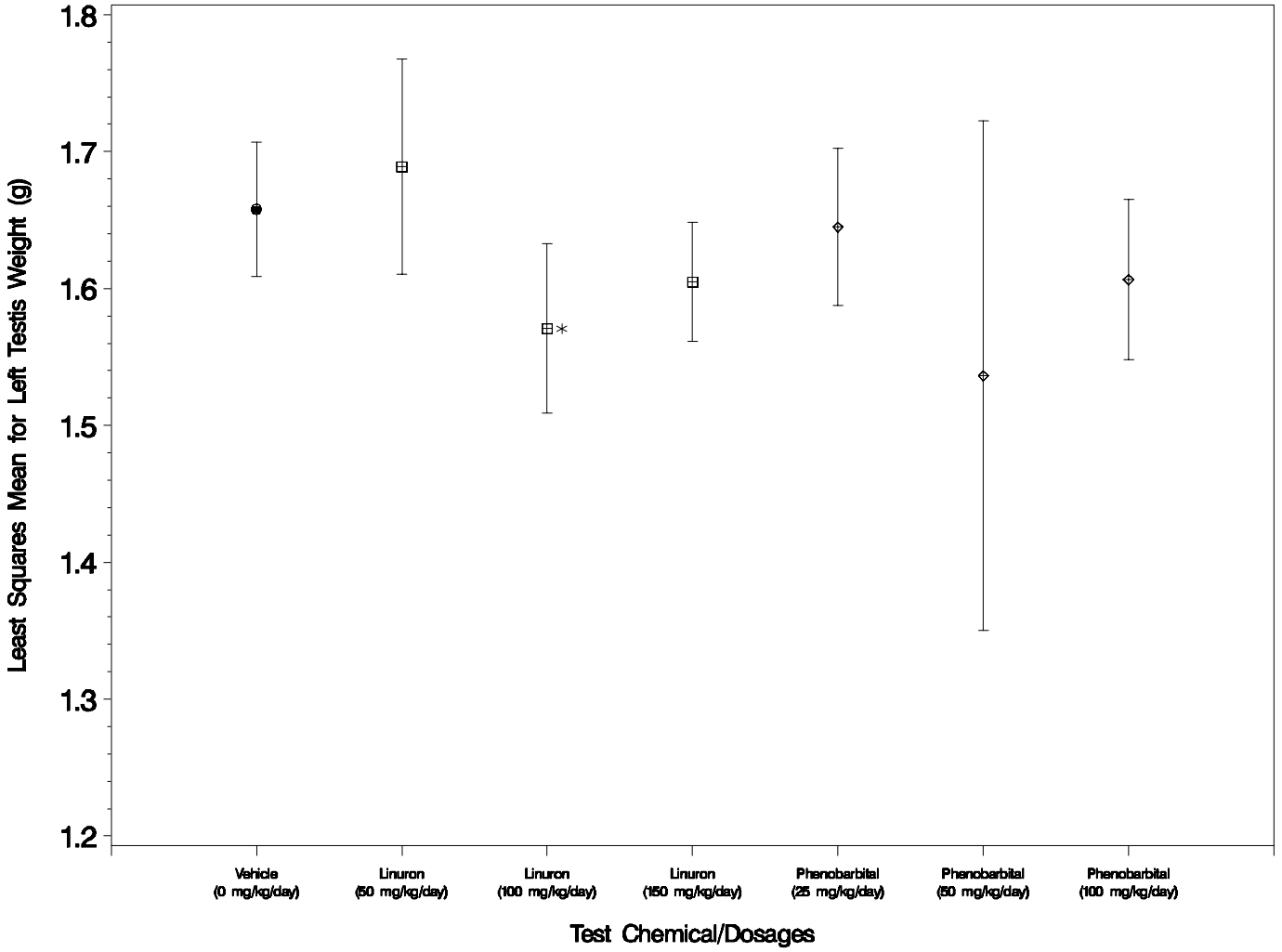


Figure 12. **<u>WIL Adult Males</u> Least Squares Means (with ± 2 Standard Error Bars) for Left Testis Weight (g) for Each Dose Group (Significant Differences from Vehicle Control are Indicated by "*" for the 0.05 Level, and by "**" for the 0.05/8 Level).**

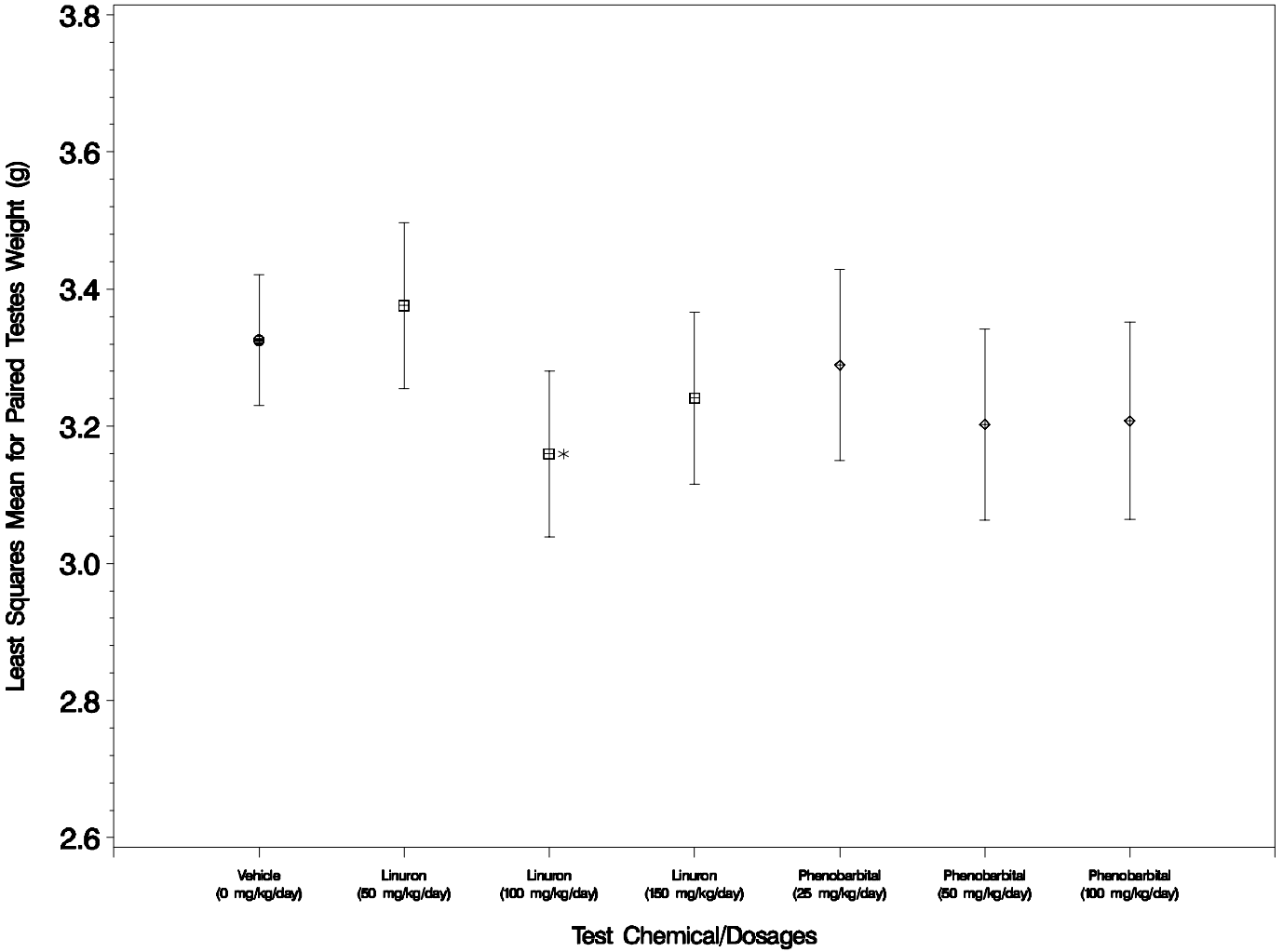


Figure 13. **<u>WIL Adult Males</u> Least Squares Means (with ± 2 Standard Error Bars) for Paired Testes Weight (g) for Each Dose Group (Significant Differences from Vehicle Control are Indicated by "*" for the 0.05 Level, and by "**" for the 0.05/8 Level).**

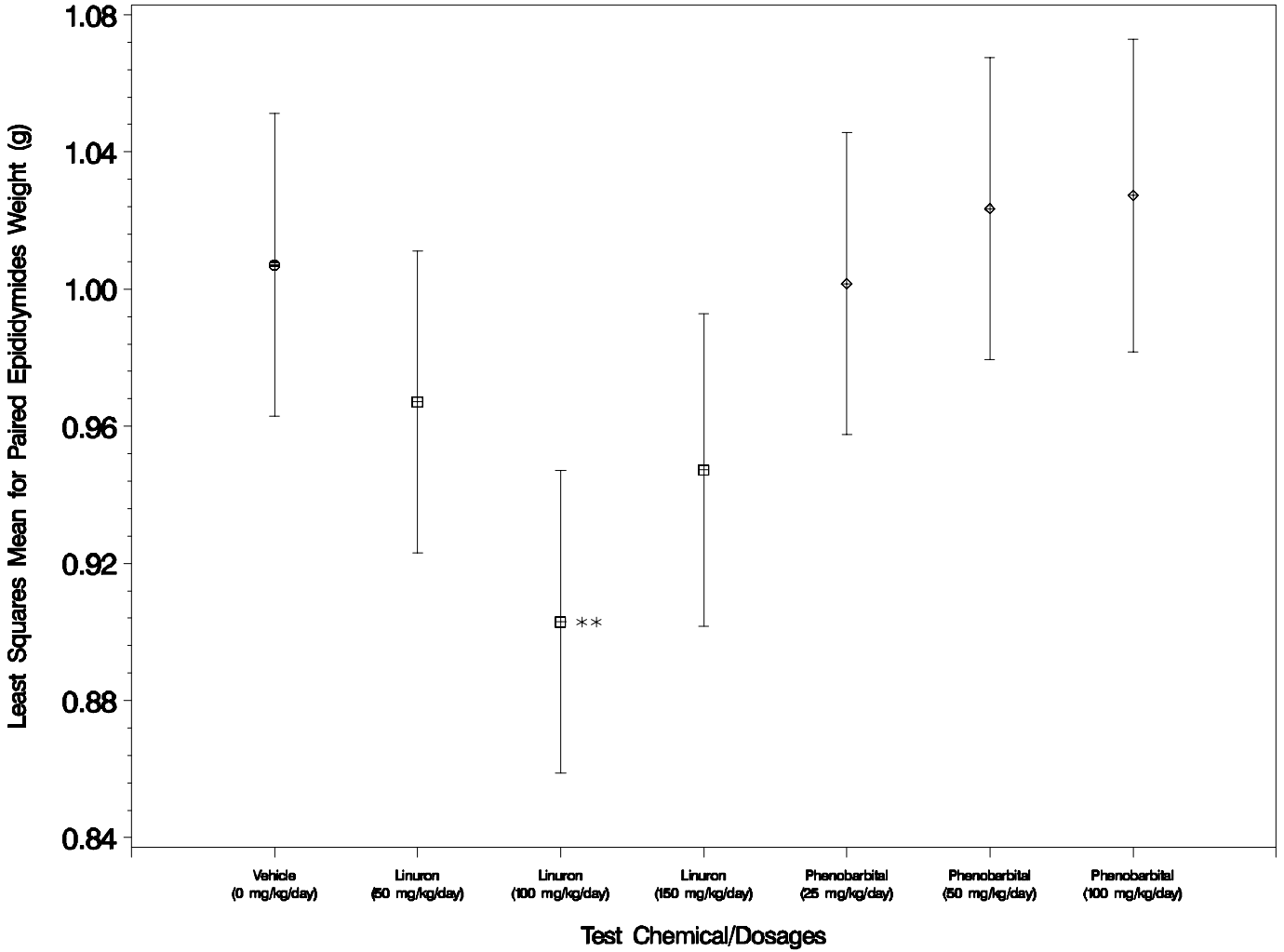


Figure 14. **<u>WIL Adult Males</u> Least Squares Means (with ± 2 Standard Error Bars) for Paired Epididymides Weight (g) for Each Dose Group (Significant Differences from Vehicle Control are Indicated by "*" for the 0.05 Level, and by "**" for the 0.05/8 Level).**

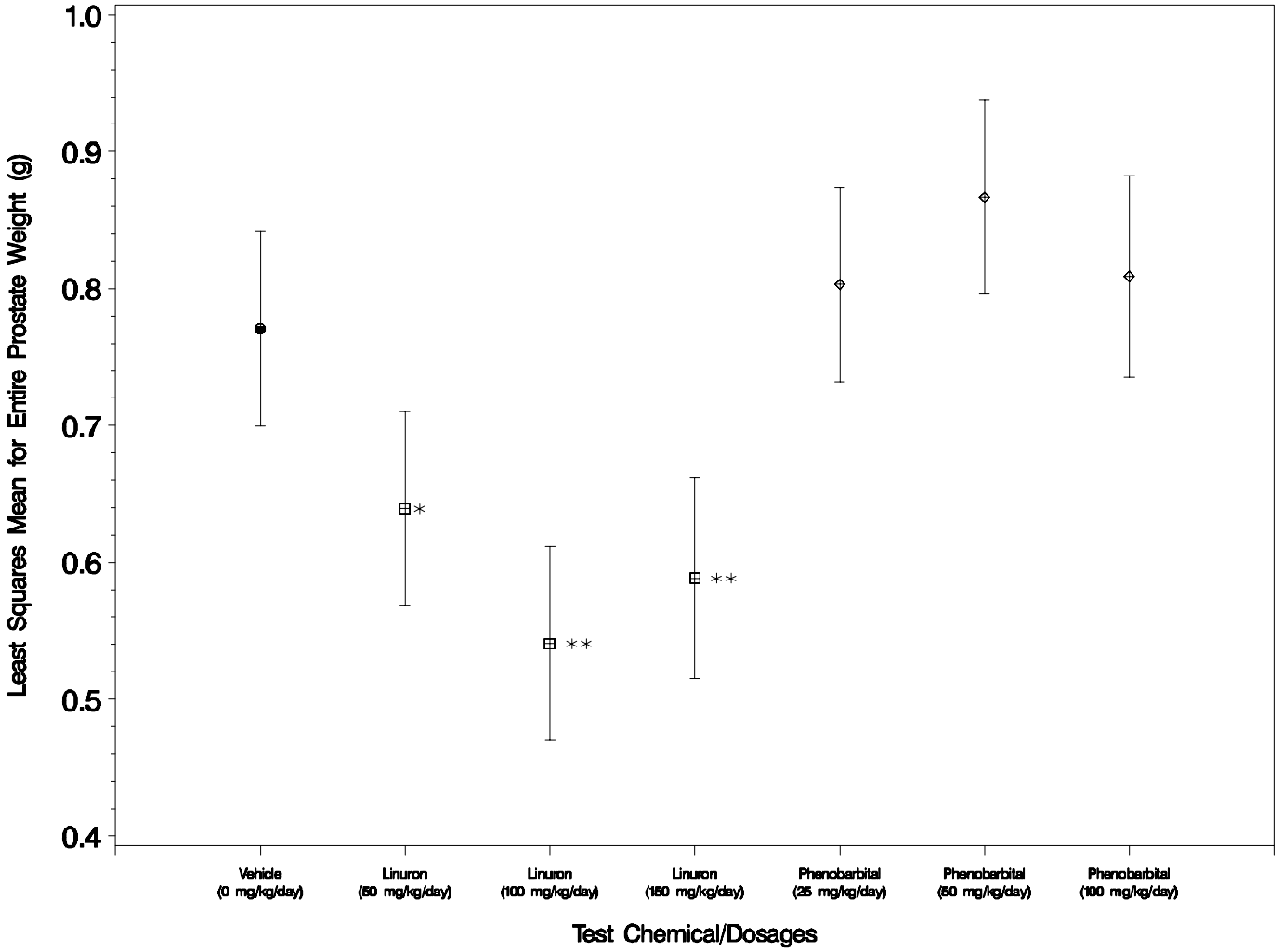


Figure 15. **<u>WIL Adult Males</u> Least Squares Means (with ± 2 Standard Error Bars) for Entire Prostate Weight (g) for Each Dose Group (Significant Differences from Vehicle Control are Indicated by "*" for the 0.05 Level, and by "**" for the 0.05/8 Level).**

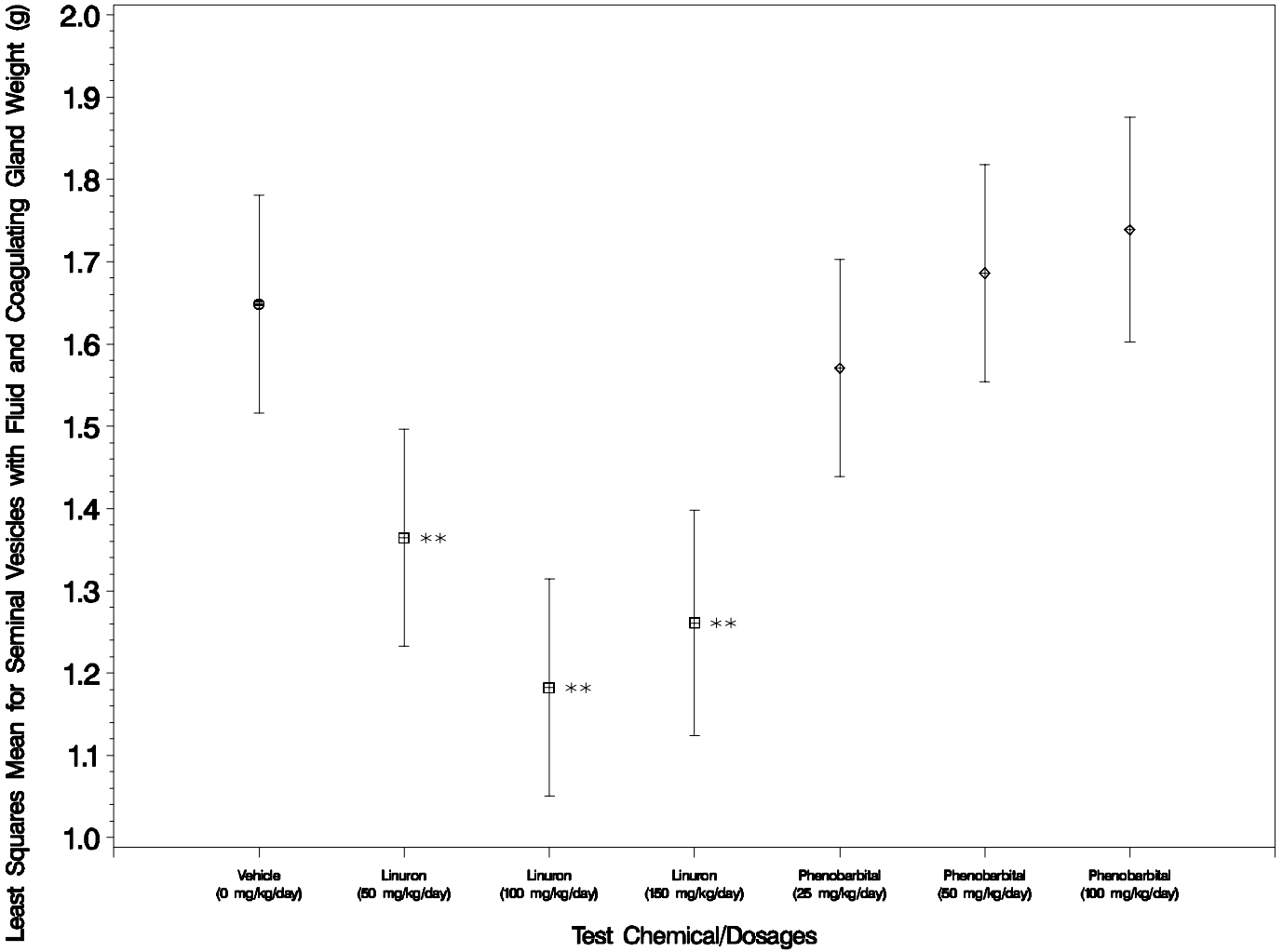


Figure 16. **<u>WIL Adult Males</u> Least Squares Means (with ± 2 Standard Error Bars) for Male Seminal Vesicles with Fluid and Coagulating Gland Weight (g) for Each Dose Group (Significant Differences from Vehicle Control are Indicated by "*" for the 0.05 Level, and by "**" for the 0.05/8 Level).**

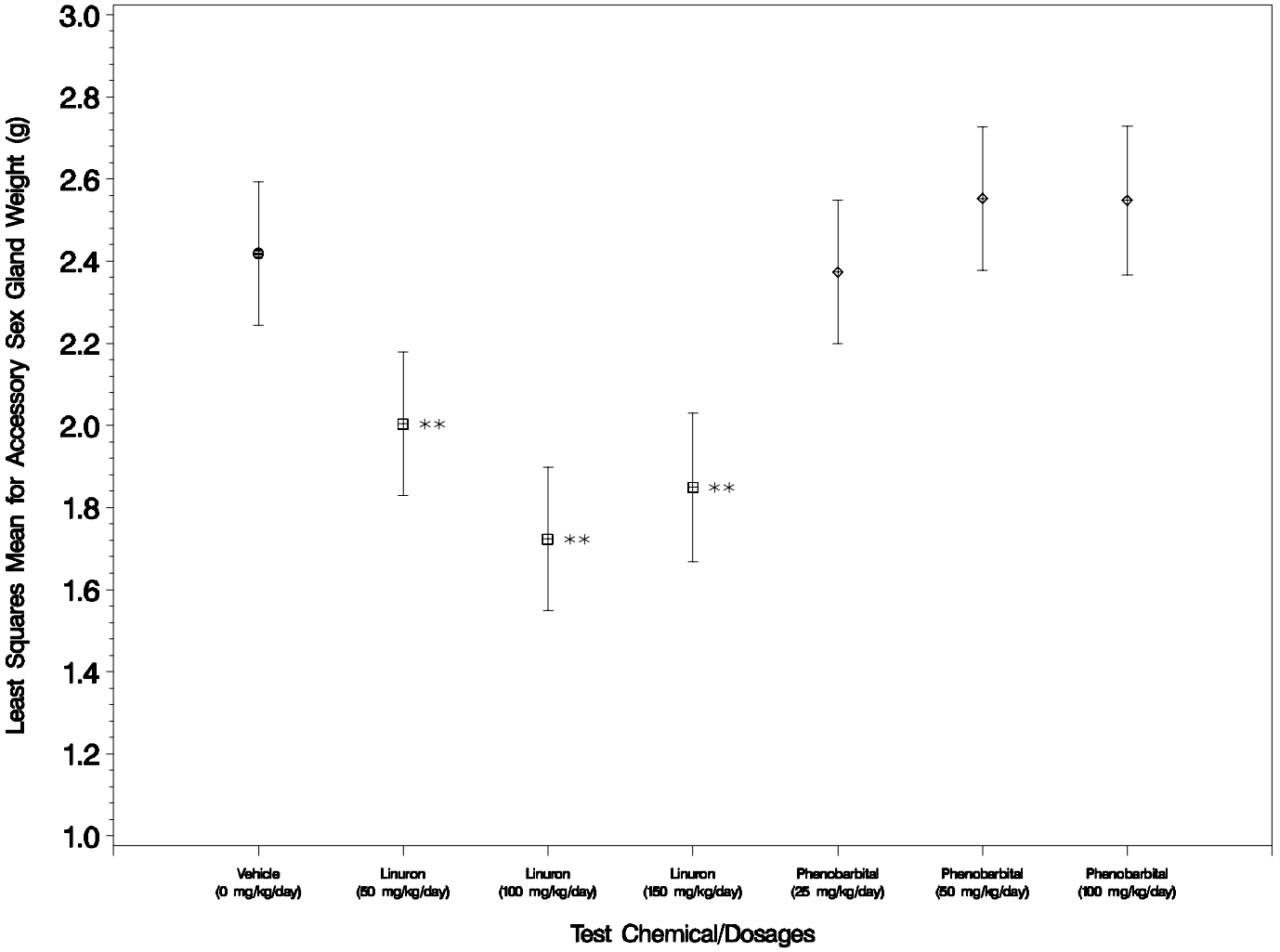


Figure 17. **<u>WIL Adult Males</u> Least Squares Means (with ± 2 Standard Error Bars) for Accessory Sex Gland Weight (g) for Each Dose Group (Significant Differences from Vehicle Control are Indicated by "*" for the 0.05 Level, and by "**" for the 0.05/8 Level).**

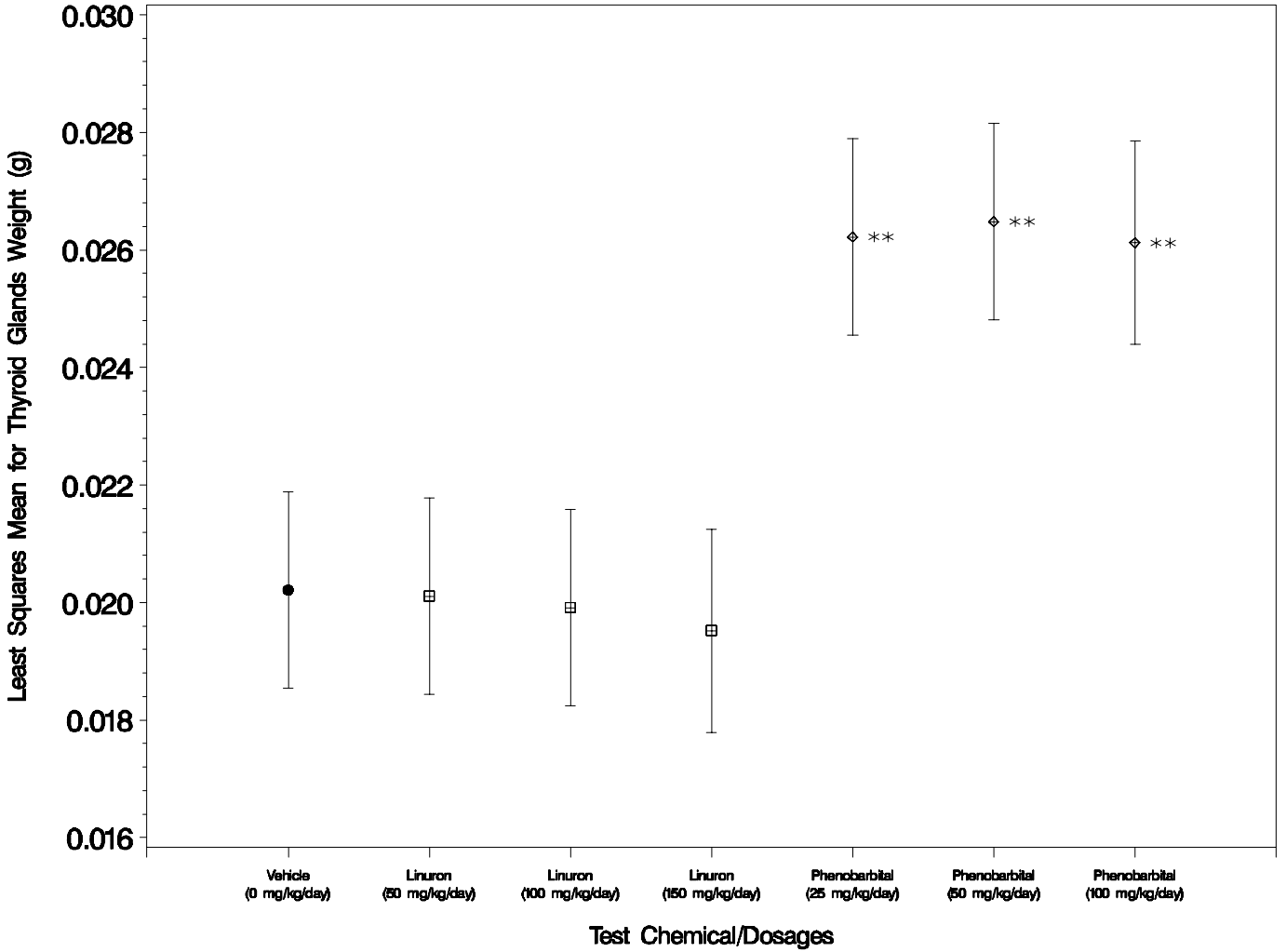


Figure 18. **<u>WIL Adult Males</u> Least Squares Means (with ± 2 Standard Error Bars) for Thyroid Glands Weight (g) for Each Dose Group (Significant Differences from Vehicle Control are Indicated by "*" for the 0.05 Level, and by "**" for the 0.05/8 Level).**

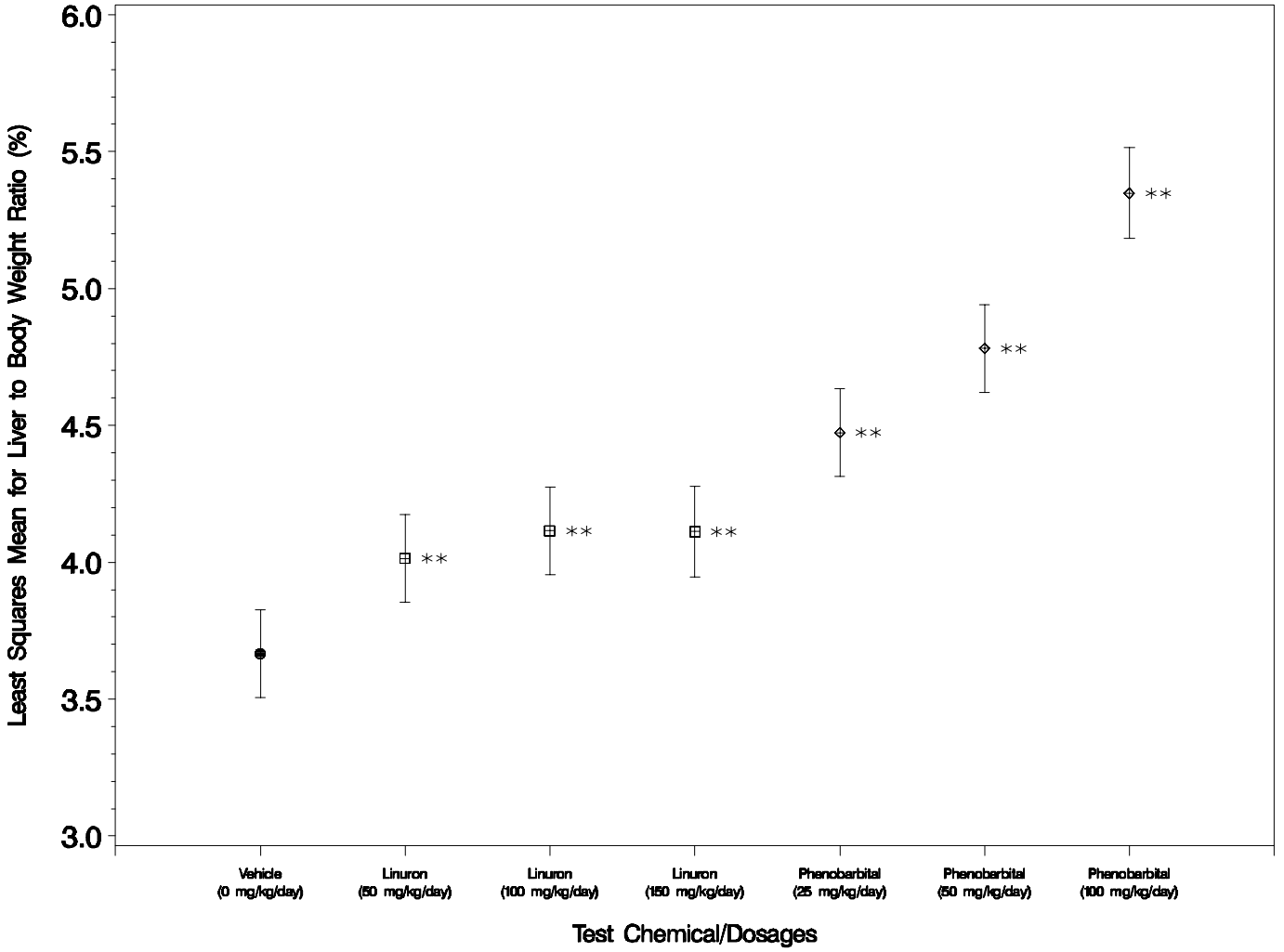


Figure 19. **<u>WIL Adult Males</u> Least Squares Means (with ± 2 Standard Error Bars) for Liver to Body Weight Ratio (%) for Each Dose Group (Significant Differences from Vehicle Control are Indicated by "*" for the 0.05 Level, and by "**" for the 0.05/8 Level).**

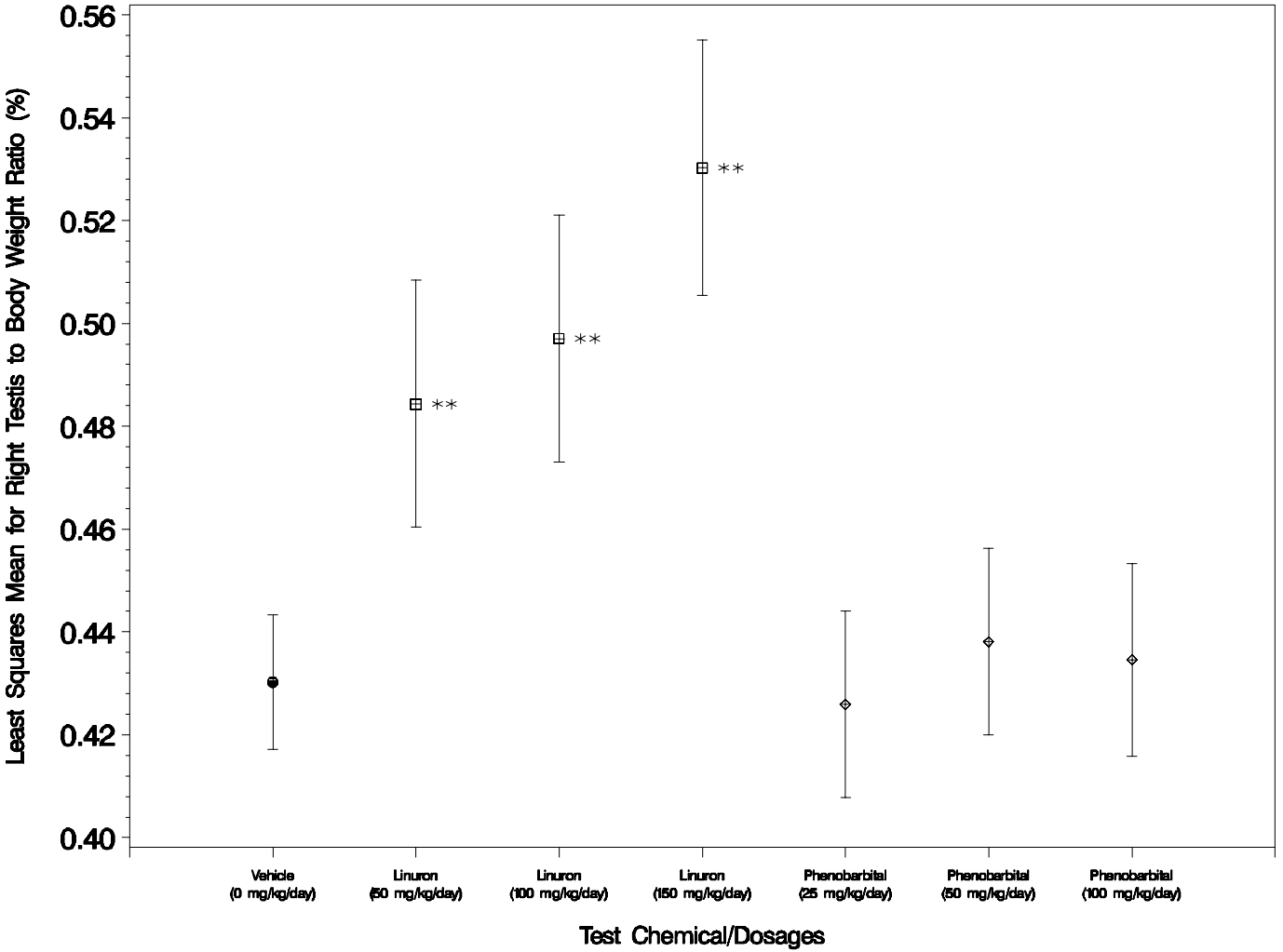


Figure 20. **<u>WIL Adult Males</u> Least Squares Means (with ± 2 Standard Error Bars) for Right Testis to Body Weight Ratio (%) for Each Dose Group (Significant Differences from Vehicle Control are Indicated by "*" for the 0.05 Level, and by "**" for the 0.05/8 Level).**

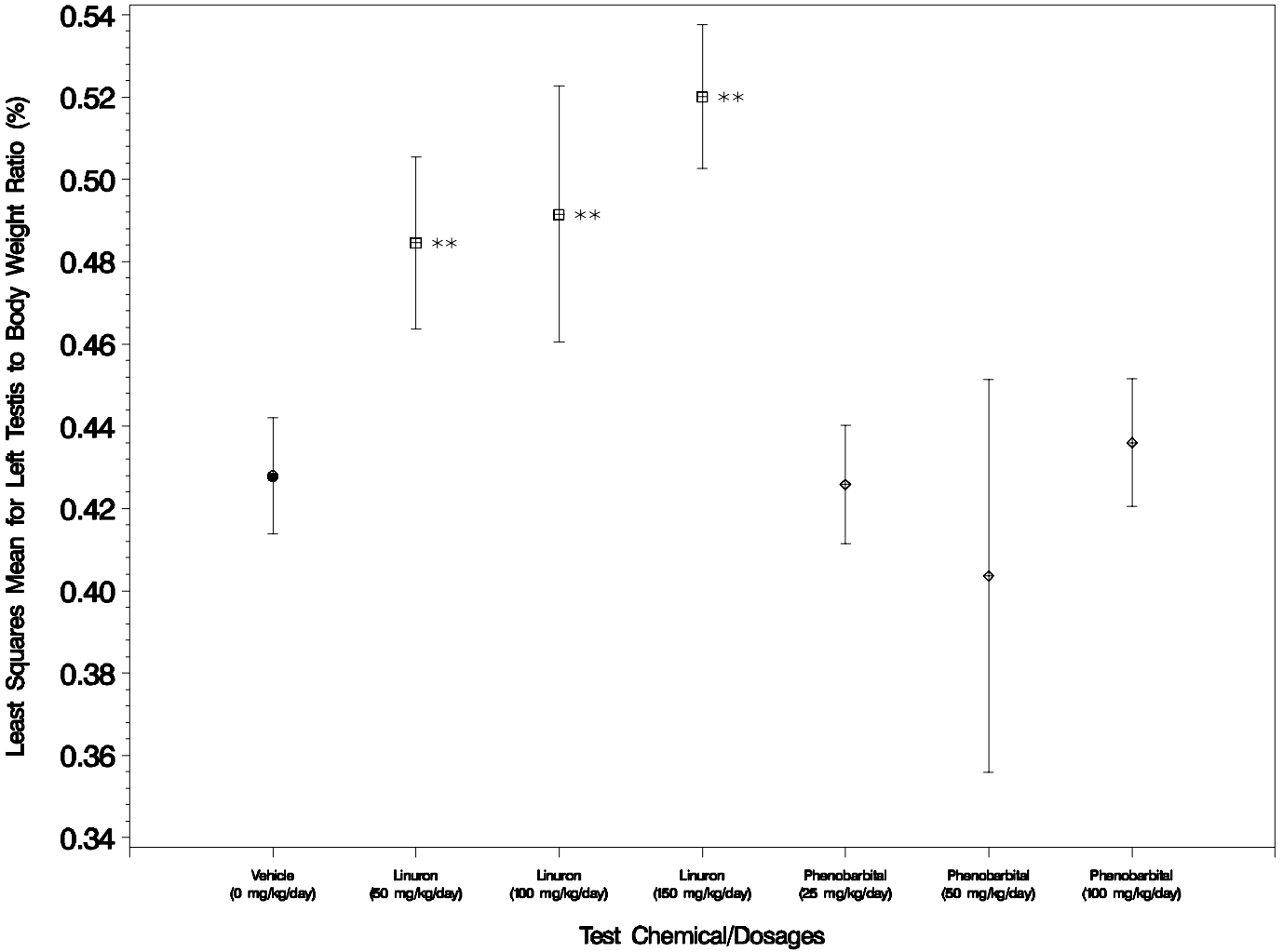


Figure 21. **<u>WIL Adult Males</u> Least Squares Means (with ± 2 Standard Error Bars) for Left Testis to Body Weight Ratio (%) for Each Dose Group (Significant Differences from Vehicle Control are Indicated by "*" for the 0.05 Level, and by "**" for the 0.05/8 Level).**

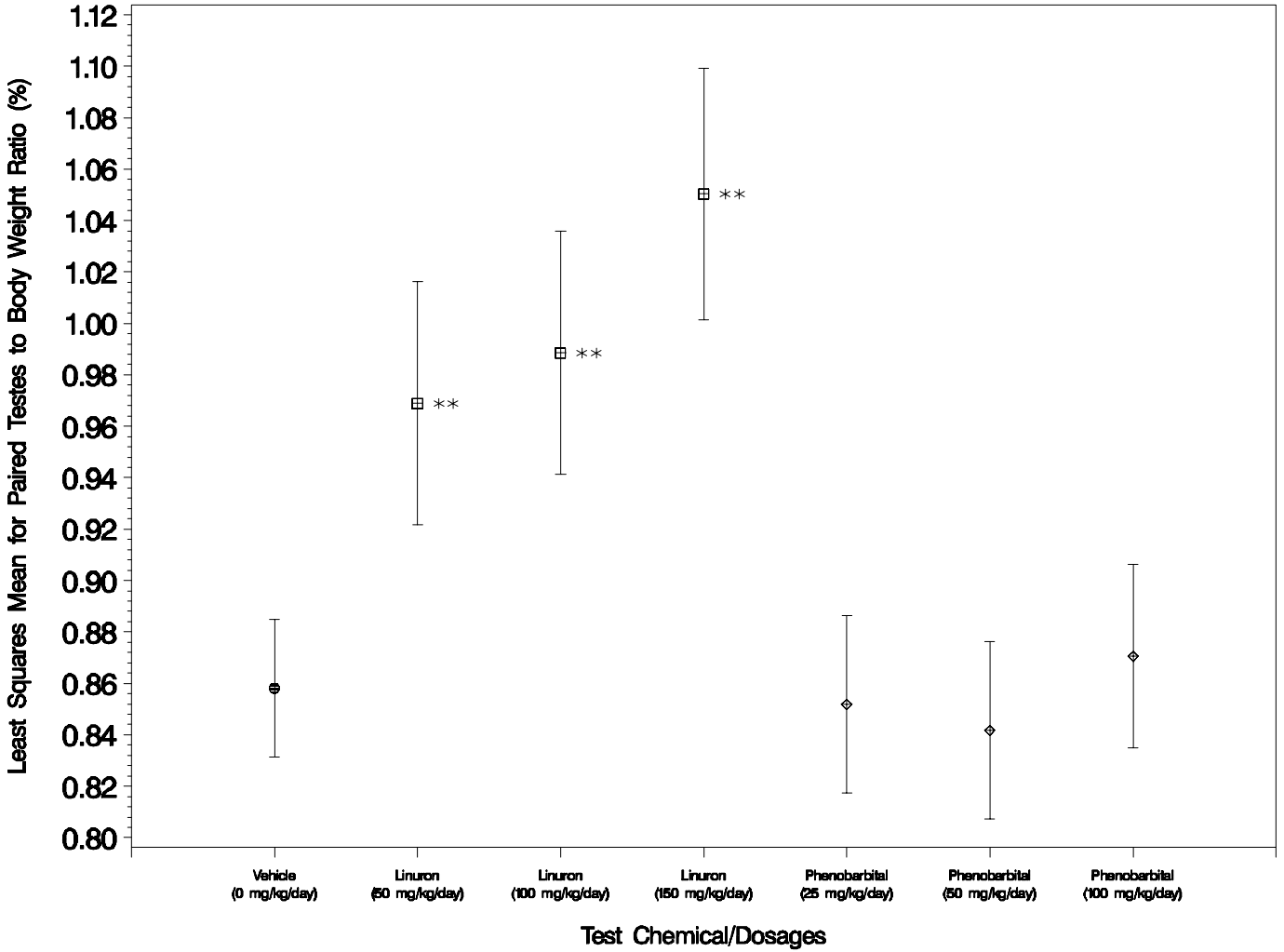


Figure 22. **<u>WIL Adult Males</u> Least Squares Means (with ± 2 Standard Error Bars) for Paired Testes to Body Weight Ratio (%) for Each Dose Group (Significant Differences from Vehicle Control are Indicated by "*" for the 0.05 Level, and by "**" for the 0.05/8 Level).**

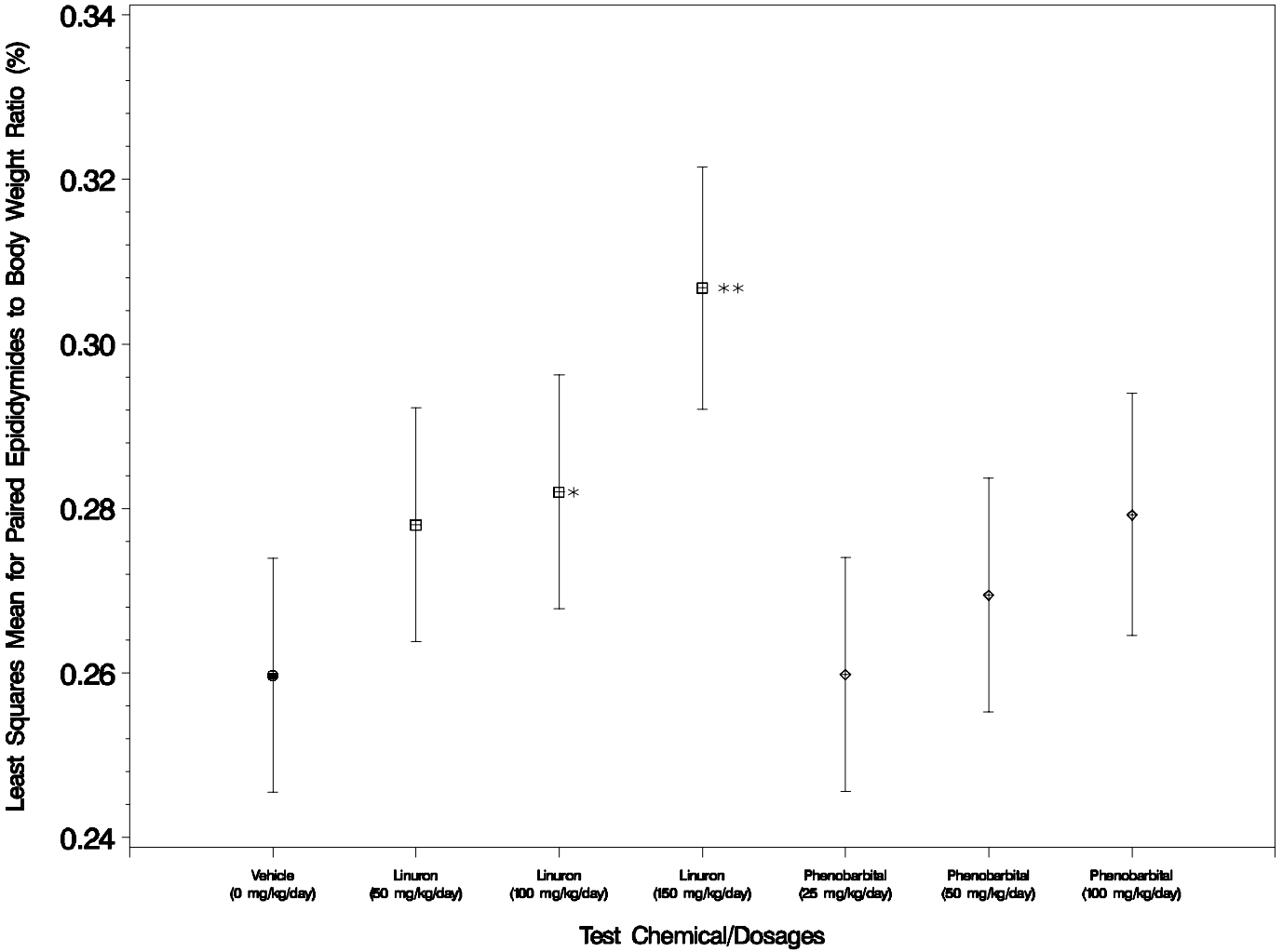


Figure 23. **<u>WIL Adult Males</u> Least Squares Means (with ± 2 Standard Error Bars) for Paired Epididymides to Body Weight Ratio (%) for Each Dose Group (Significant Differences from Vehicle Control are Indicated by "*" for the 0.05 Level, and by "**" for the 0.05/8 Level).**

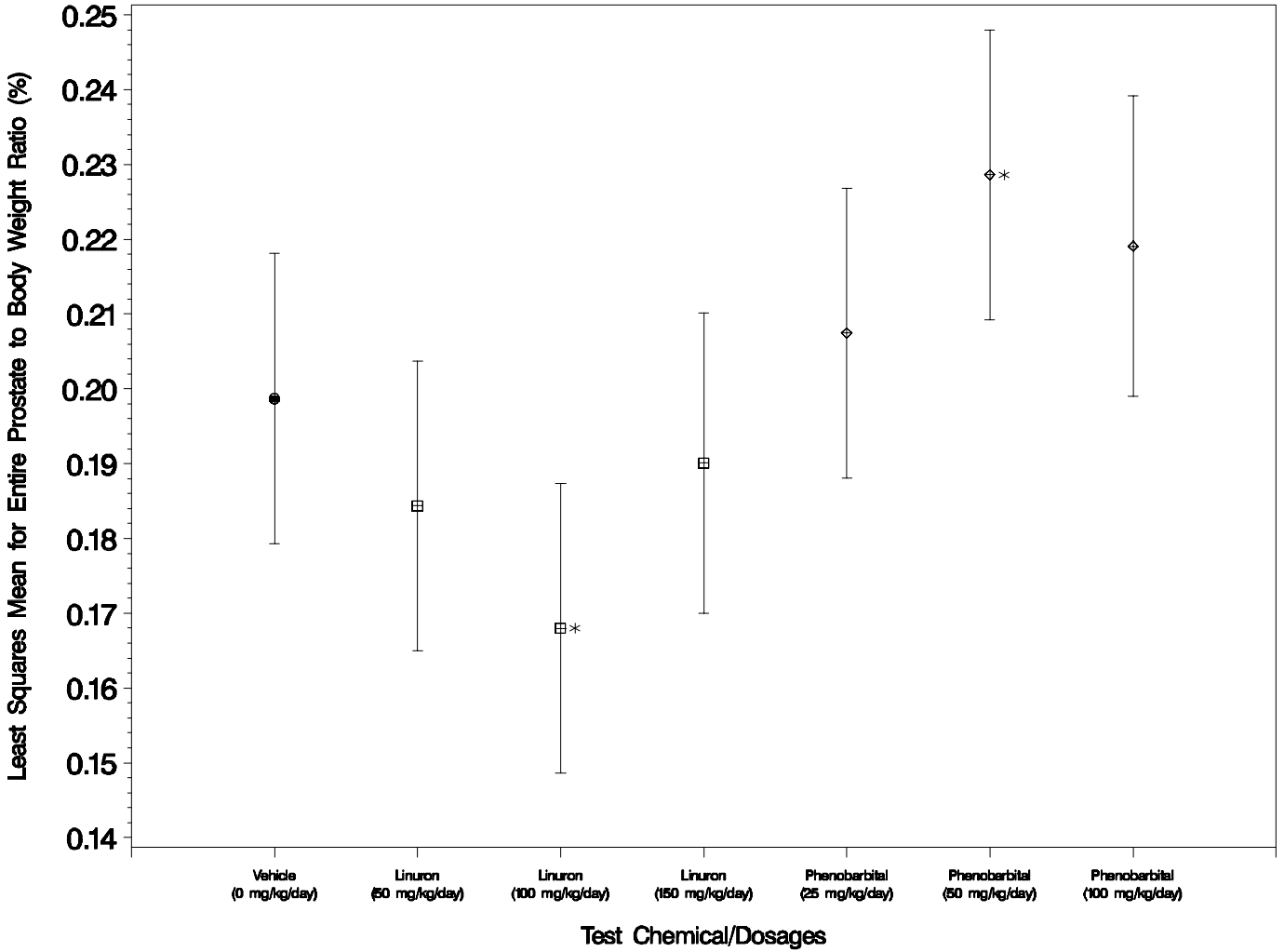


Figure 24. **<u>WIL Adult Males</u> Least Squares Means (with ± 2 Standard Error Bars) for Entire Prostate to Body Weight Ratio (%) for Each Dose Group (Significant Differences from Vehicle Control are Indicated by "*" for the 0.05 Level, and by "**" for the 0.05/8 Level).**

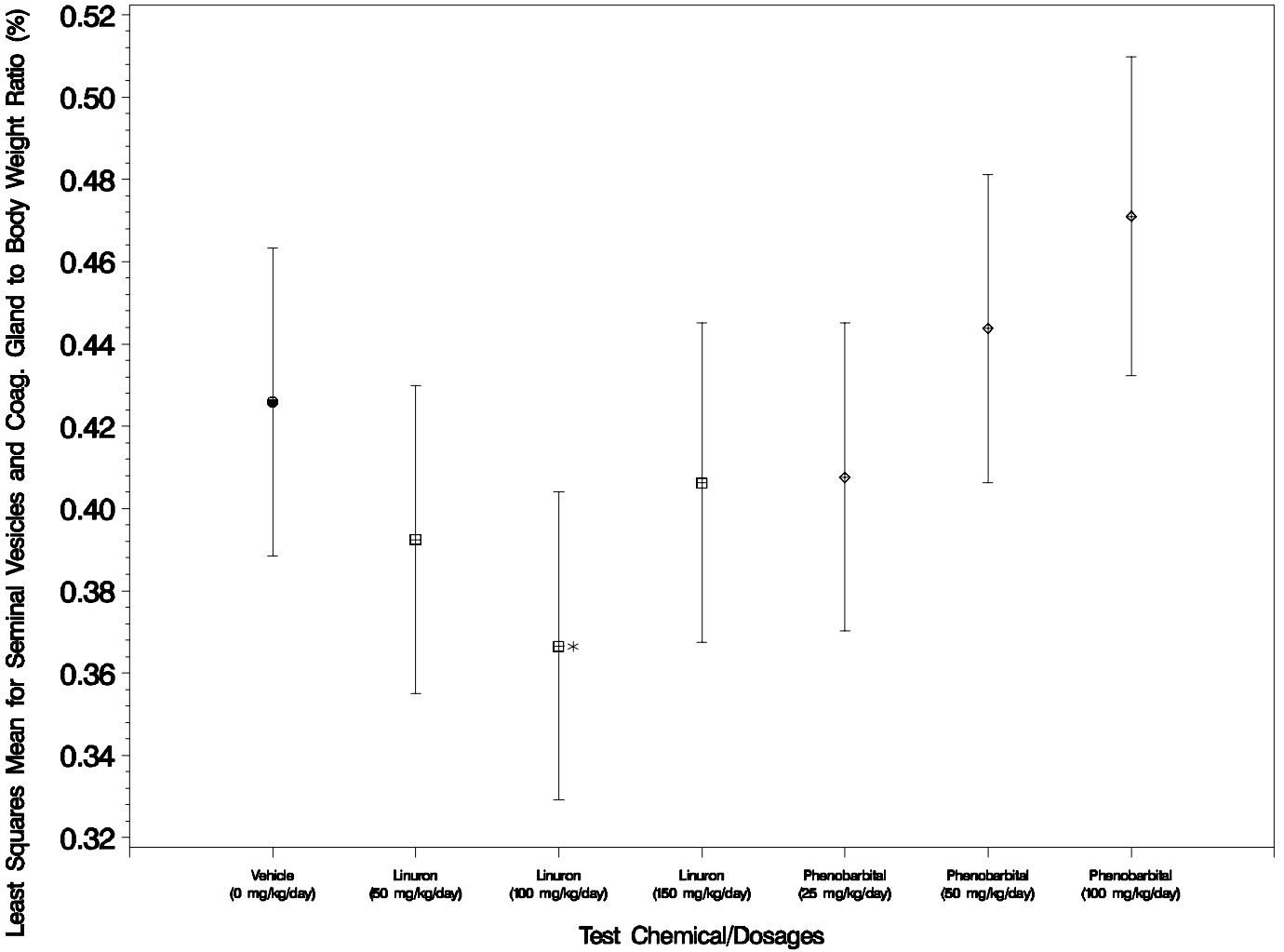


Figure 25. **<u>WIL Adult Males</u> Least Squares Means (with ± 2 Standard Error Bars) for Seminal Vesicles with Fluid and Coagulating Gland to Body Weight Ratio (%) for Each Dose Group (Significant Differences from Vehicle Control are Indicated by "*" for the 0.05 Level, and by "**" for the 0.05/8 Level).**

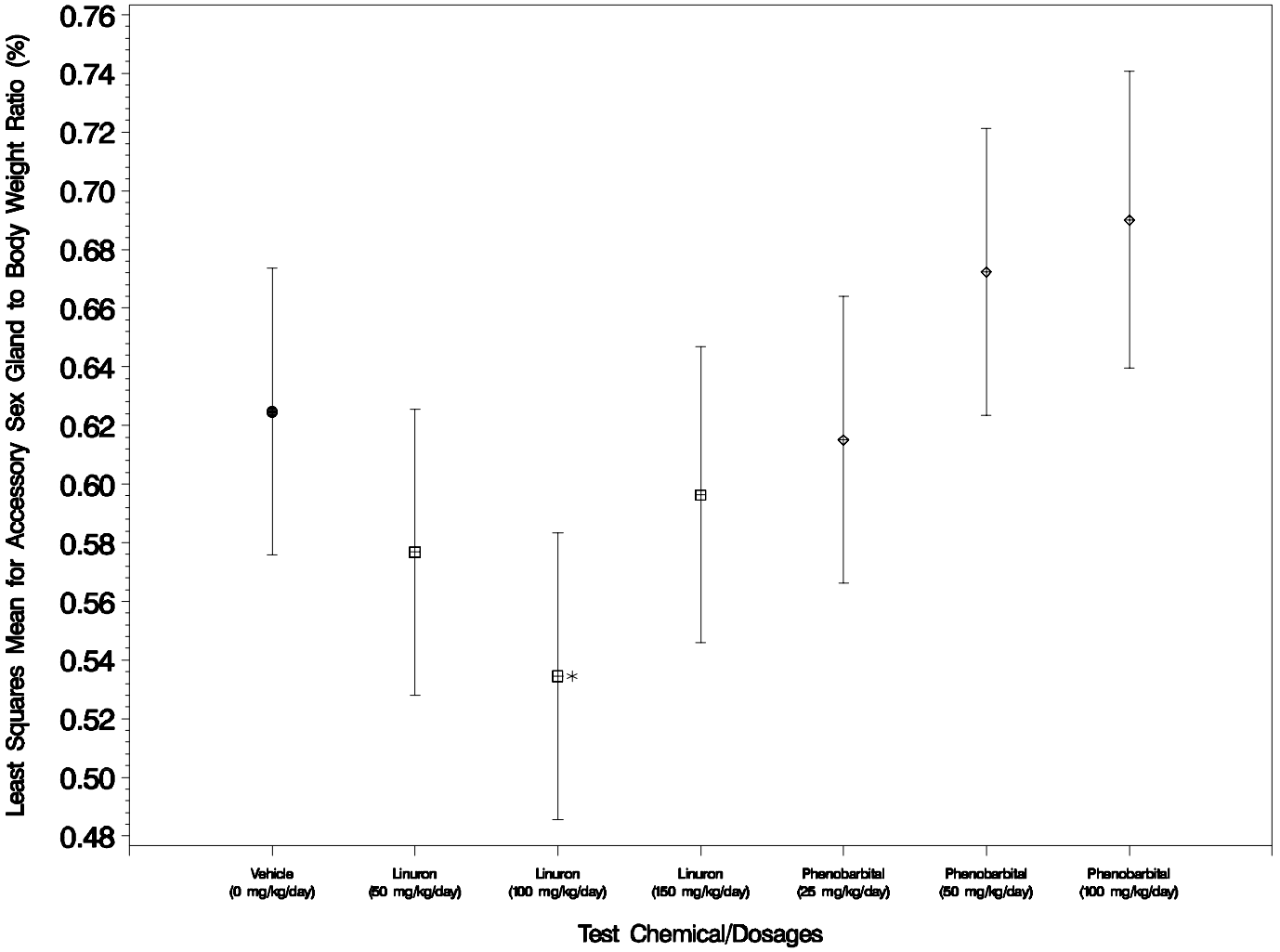


Figure 26. **<u>WIL Adult Males</u> Least Squares Means (with ± 2 Standard Error Bars) for Accessory Sex Gland to Body Weight Ratio (%) for Each Dose Group (Significant Differences from Vehicle Control are Indicated by "*" for the 0.05 Level, and by "**" for the 0.05/8 Level).**

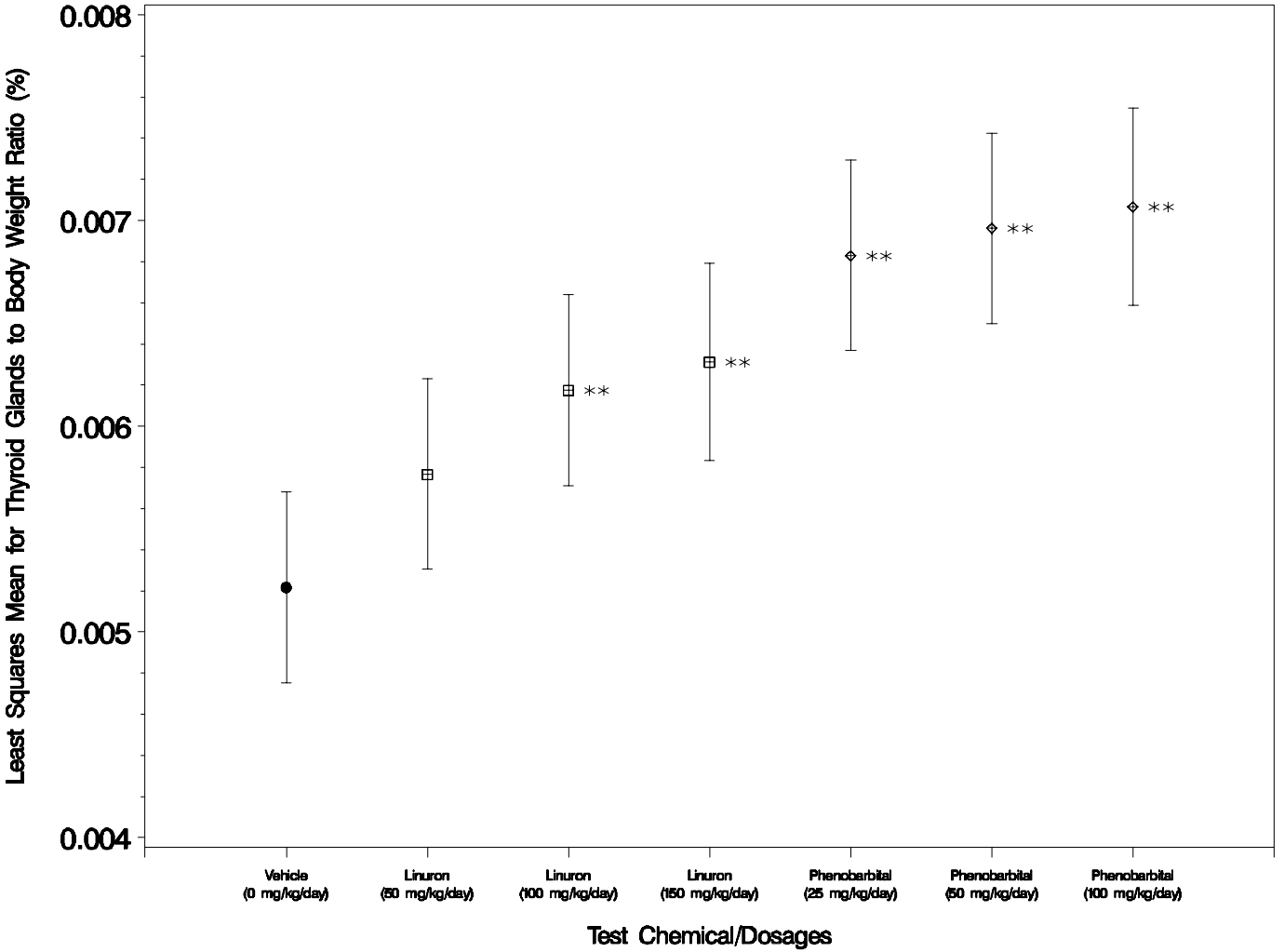


Figure 27. **<u>WIL Adult Males</u> Least Squares Means (with ± 2 Standard Error Bars) for Thyroid Glands to Body Weight Ratio (%) for Each Dose Group (Significant Differences from Vehicle Control are Indicated by "*" for the 0.05 Level, and by "**" for the 0.05/8 Level).**

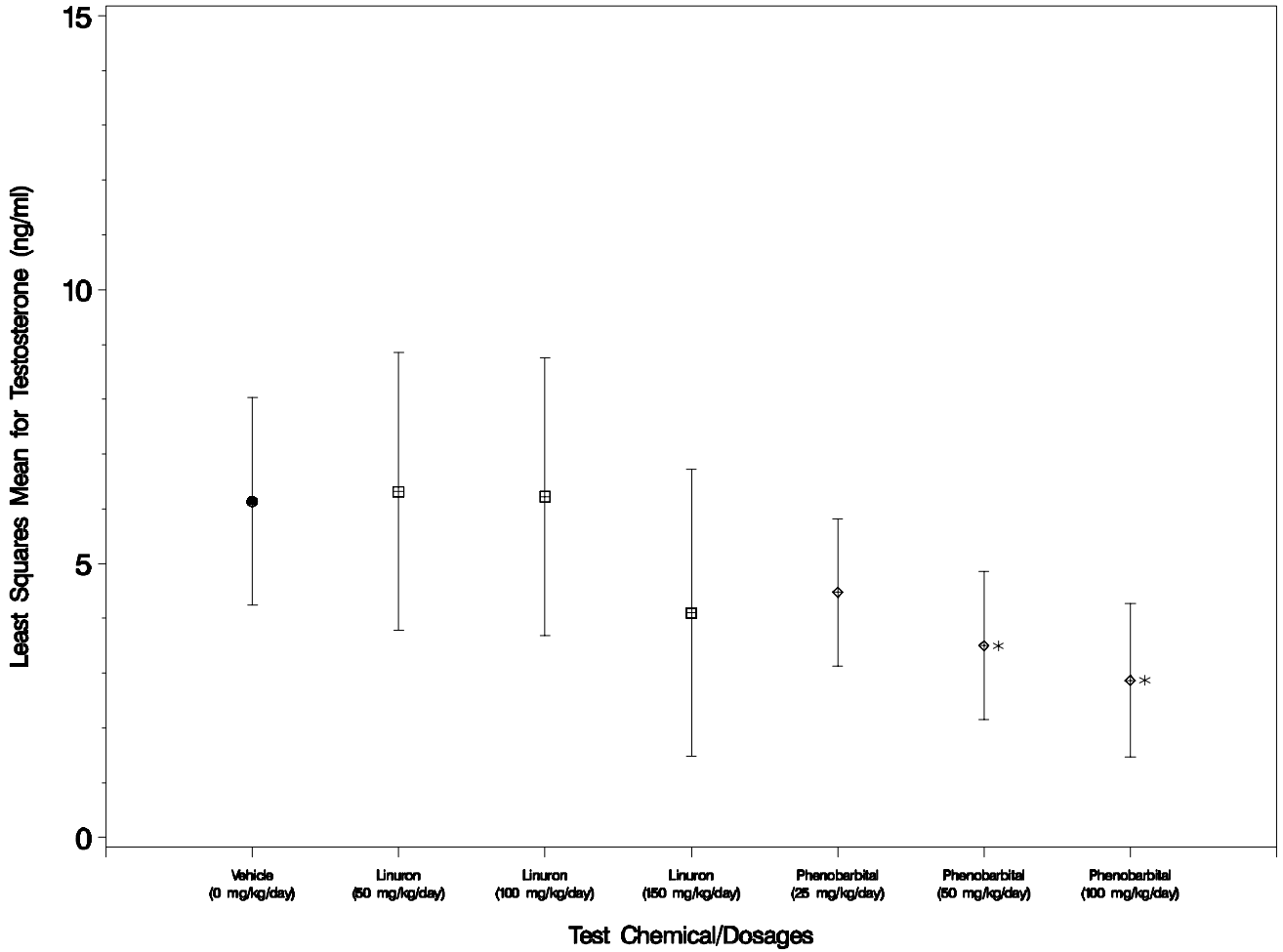


Figure 28. **<u>WIL Adult Males</u> Least Squares Means (with ± 2 Standard Error Bars) for Testosterone (ng/ml) For Each Dose Group (Significant Differences from Vehicle Control are Indicated by "*" for the 0.05 Level, and by "**" for the 0.05/8 Level).**

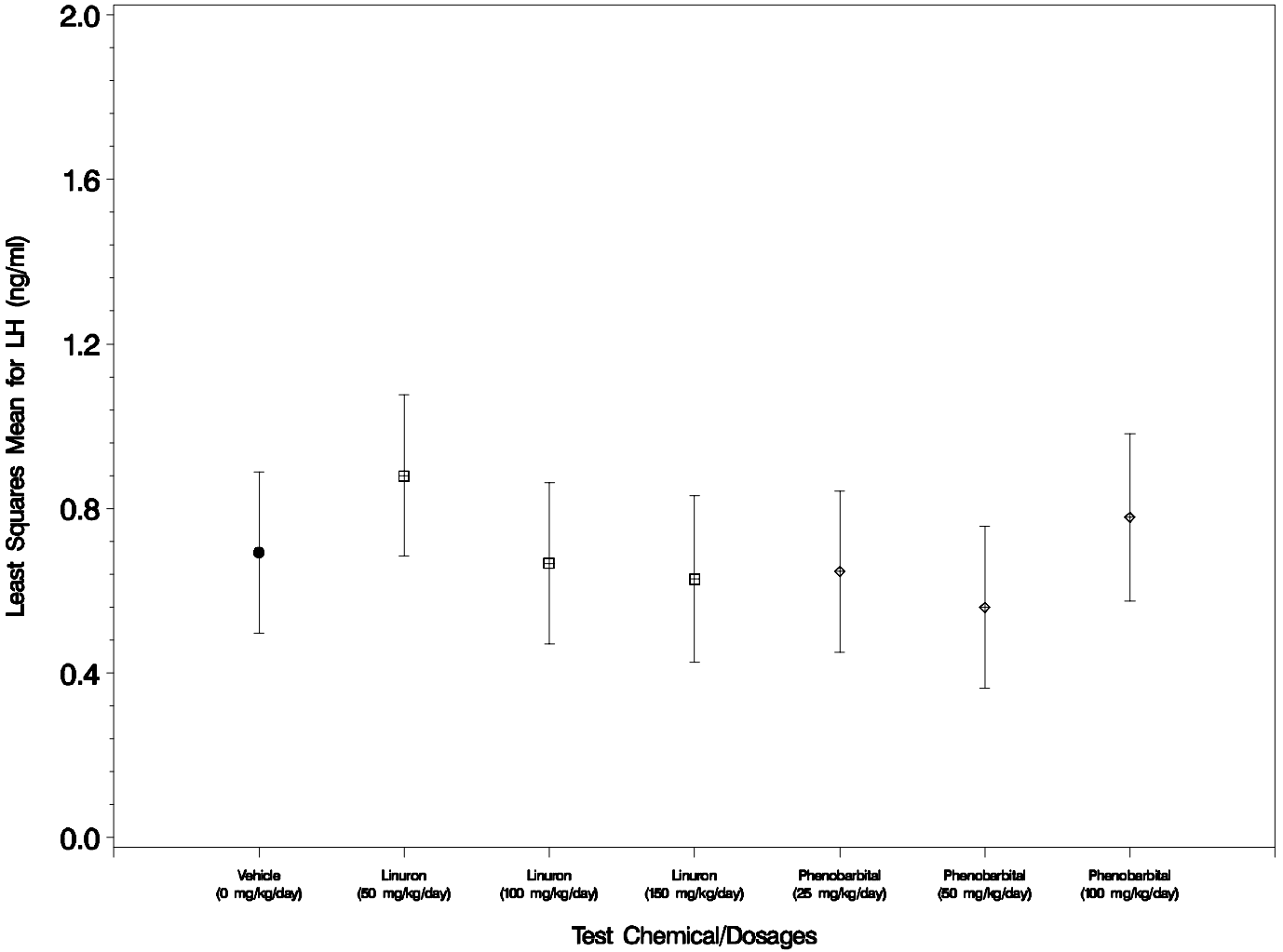


Figure 29. **<u>WIL Adult Males</u> Least Squares Means (with ± 2 Standard Error Bars) for LH (ng/ml) for Each Dose Group (Significant Differences from Vehicle Control are Indicated by "*" for the 0.05 Level, and by "**" for the 0.05/8 Level).**

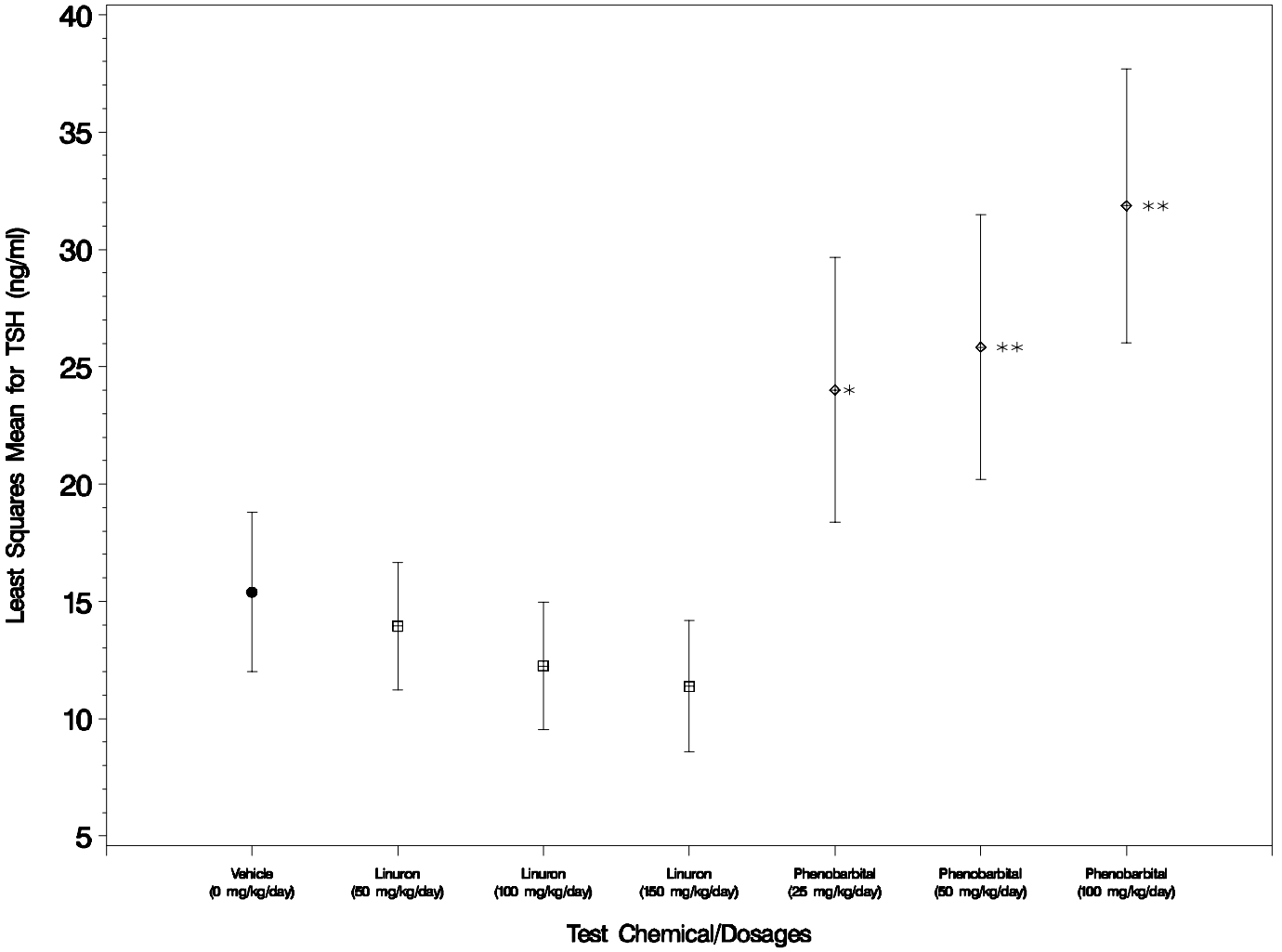


Figure 30. **<u>WIL Adult Males</u> Least Squares Means (with ± 2 Standard Error Bars) for TSH (ng/ml) for Each Dose Group (Significant Differences from Vehicle Control are Indicated by "*" for the 0.05 Level, and by "**" for the 0.05/8 Level).**

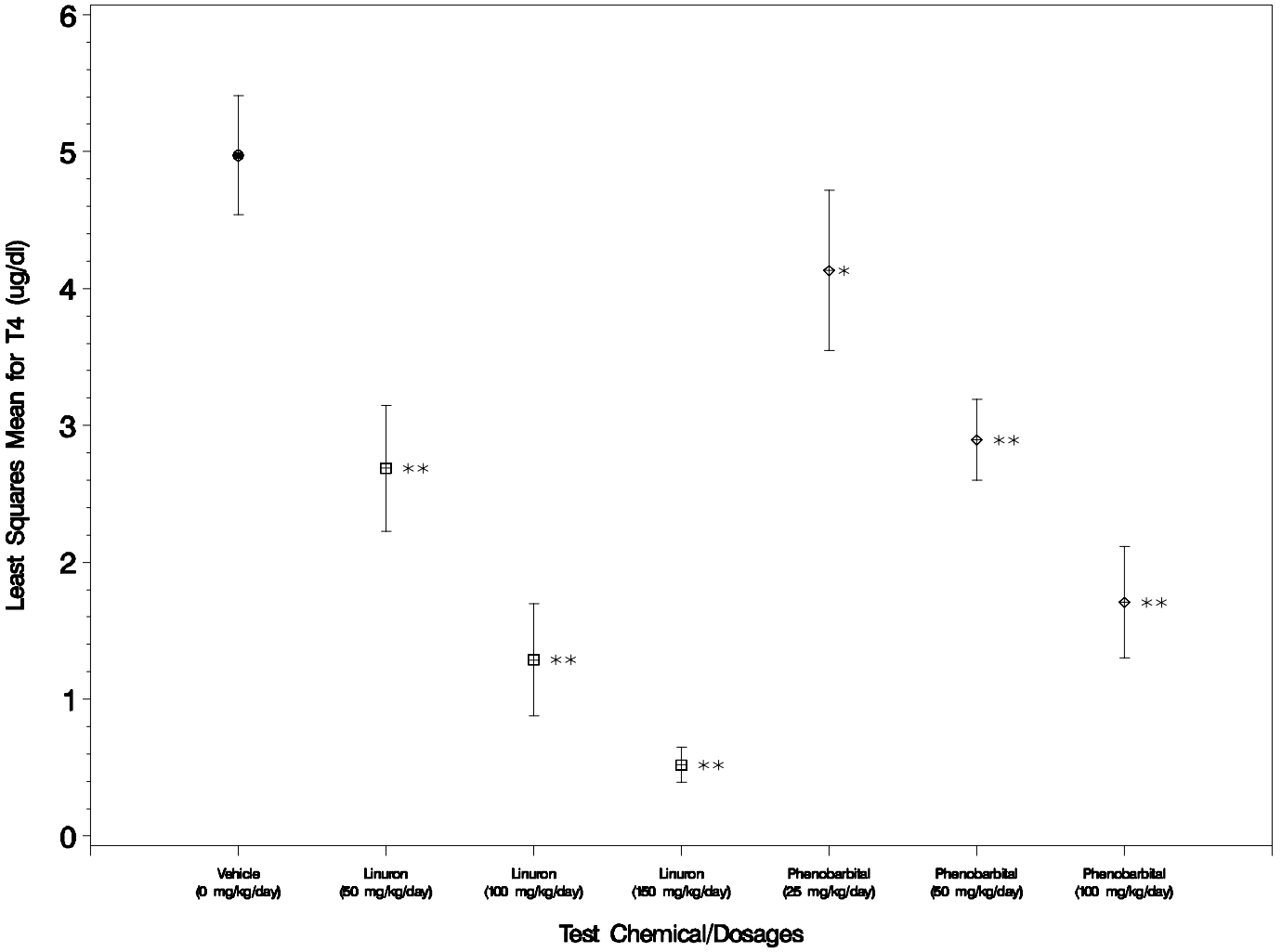


Figure 31. **<u>WIL Adult Males</u> Least Squares Means (with ± 2 Standard Error Bars) for T4 (ug/dl) for Each Dose Group (Significant Differences from Vehicle Control are Indicated by "*" for the 0.05 Level, and by "**" for the 0.05/8 Level).**

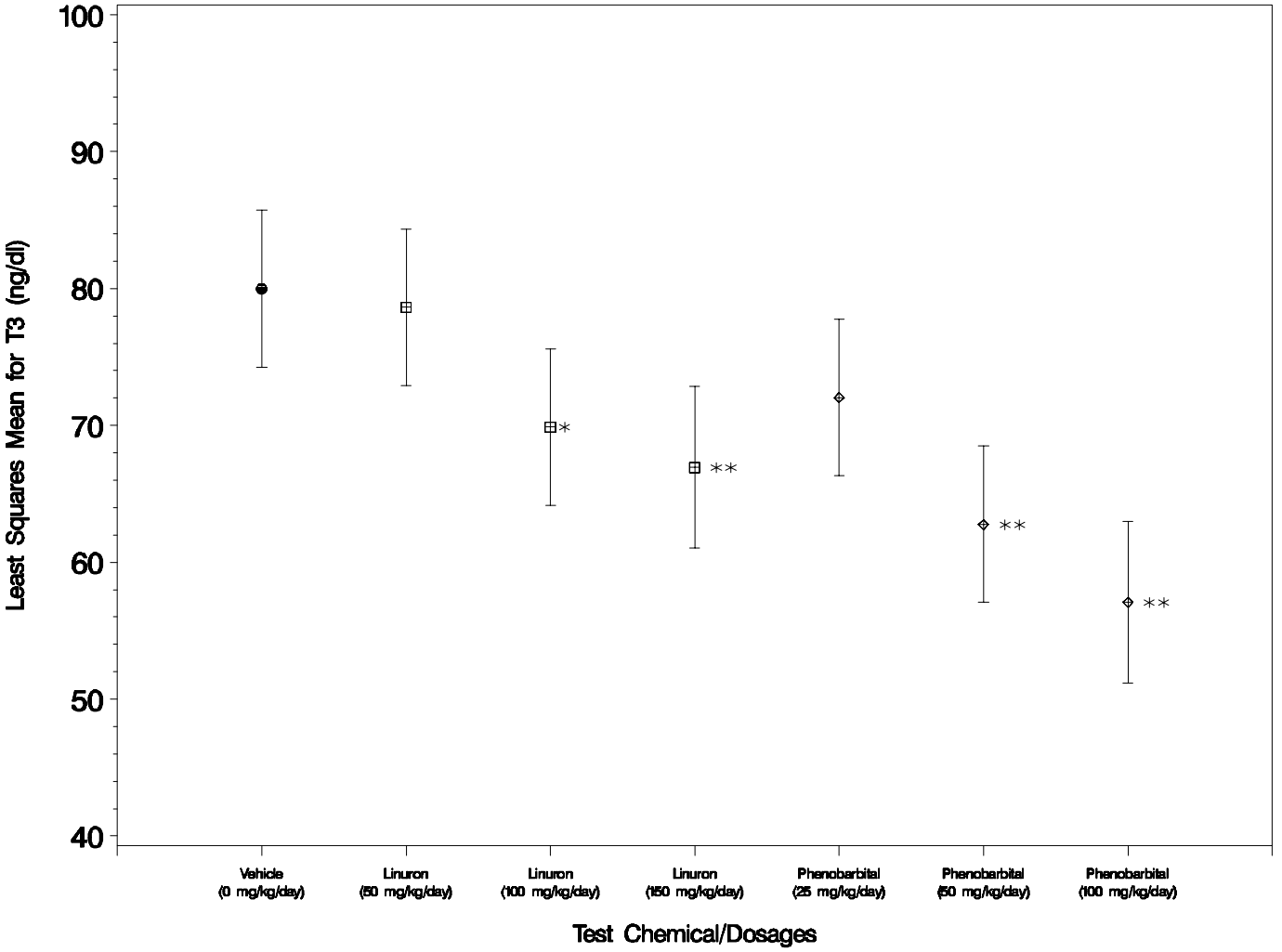


Figure 32 **<u>WIL Adult Males</u> Least Squares Means (with ± 2 Standard Error Bars) for T3 (ng/dl) for Each Dose Group (Significant Differences from Vehicle Control are Indicated by "*" for the 0.05 Level, and by "**" for the 0.05/8 Level).**

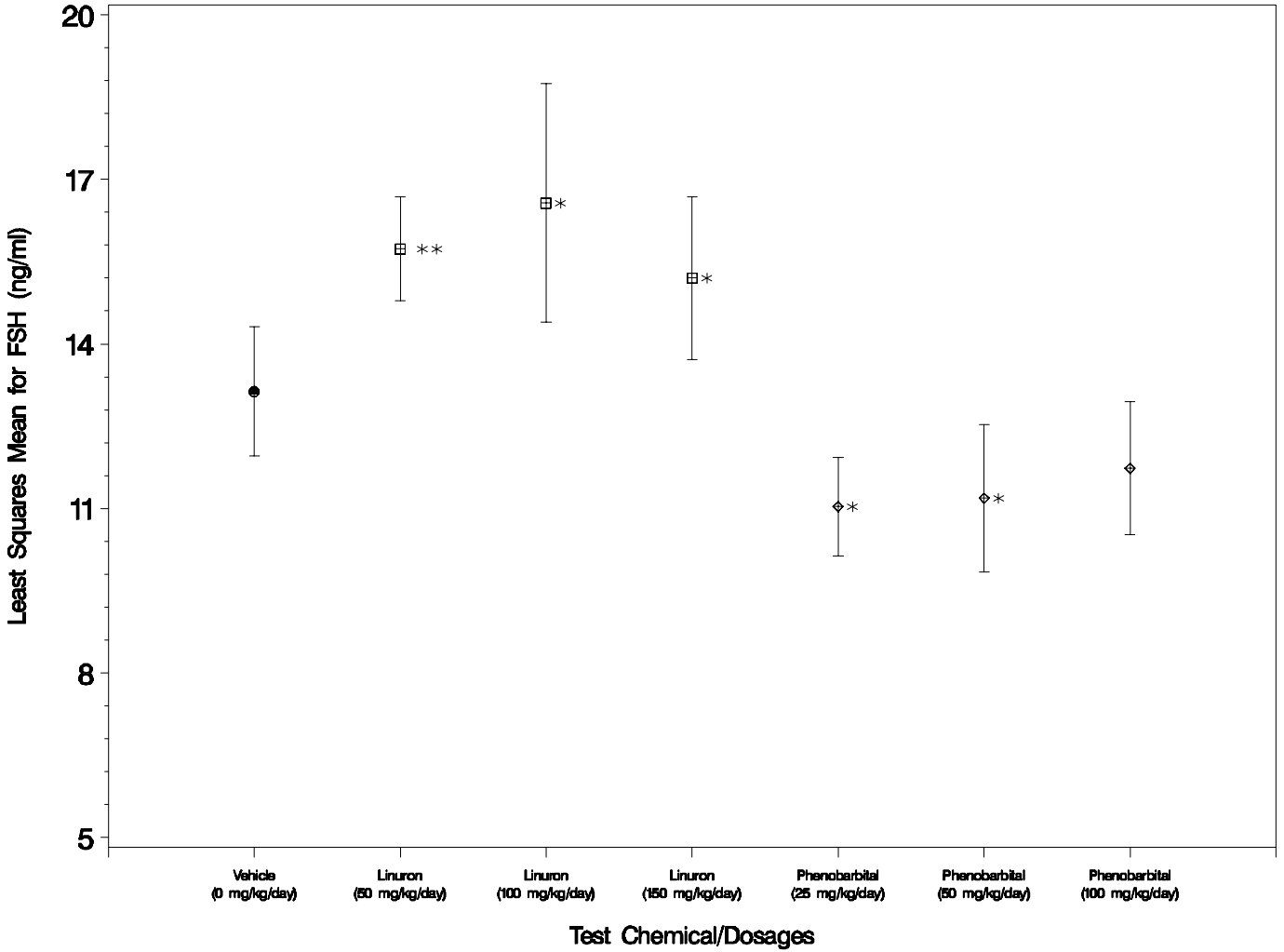


Figure 33. **<u>WIL Adult Males</u> Least Squares Means (with ± 2 Standard Error Bars) for FSH (ng/ml) for Each Dose Group (Significant Differences from Vehicle Control are Indicated by "*" for the 0.05 Level, and by "**" for the 0.05/8 Level).**

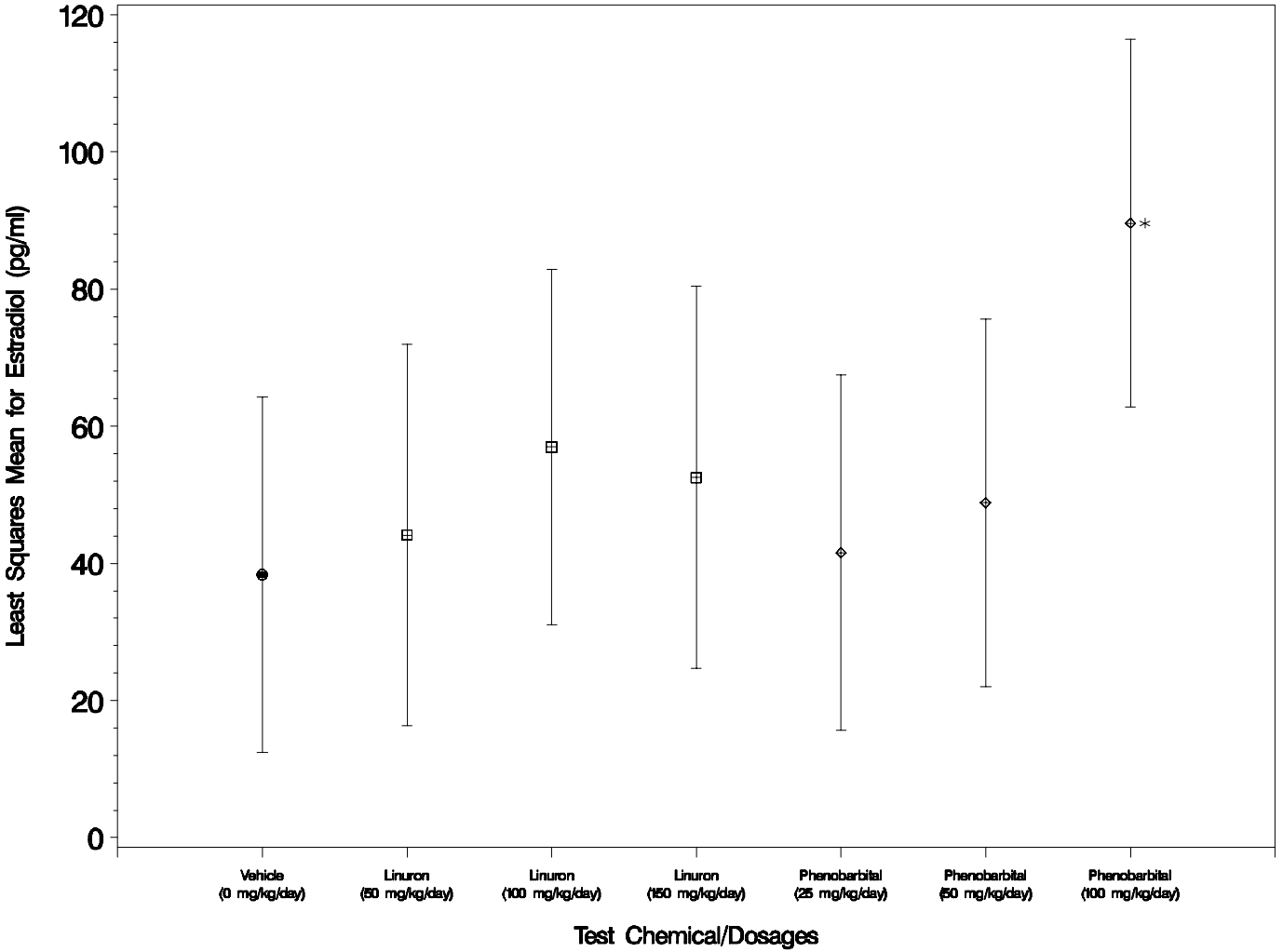


Figure 34. **<u>WIL Adult Males</u> Least Squares Means (with ± 2 Standard Error Bars) for Estradiol (pg/ml) for Each Dose Group (Significant Differences from Vehicle Control are Indicated by "*" for the 0.05 Level, and by "**" for the 0.05/8 Level).**

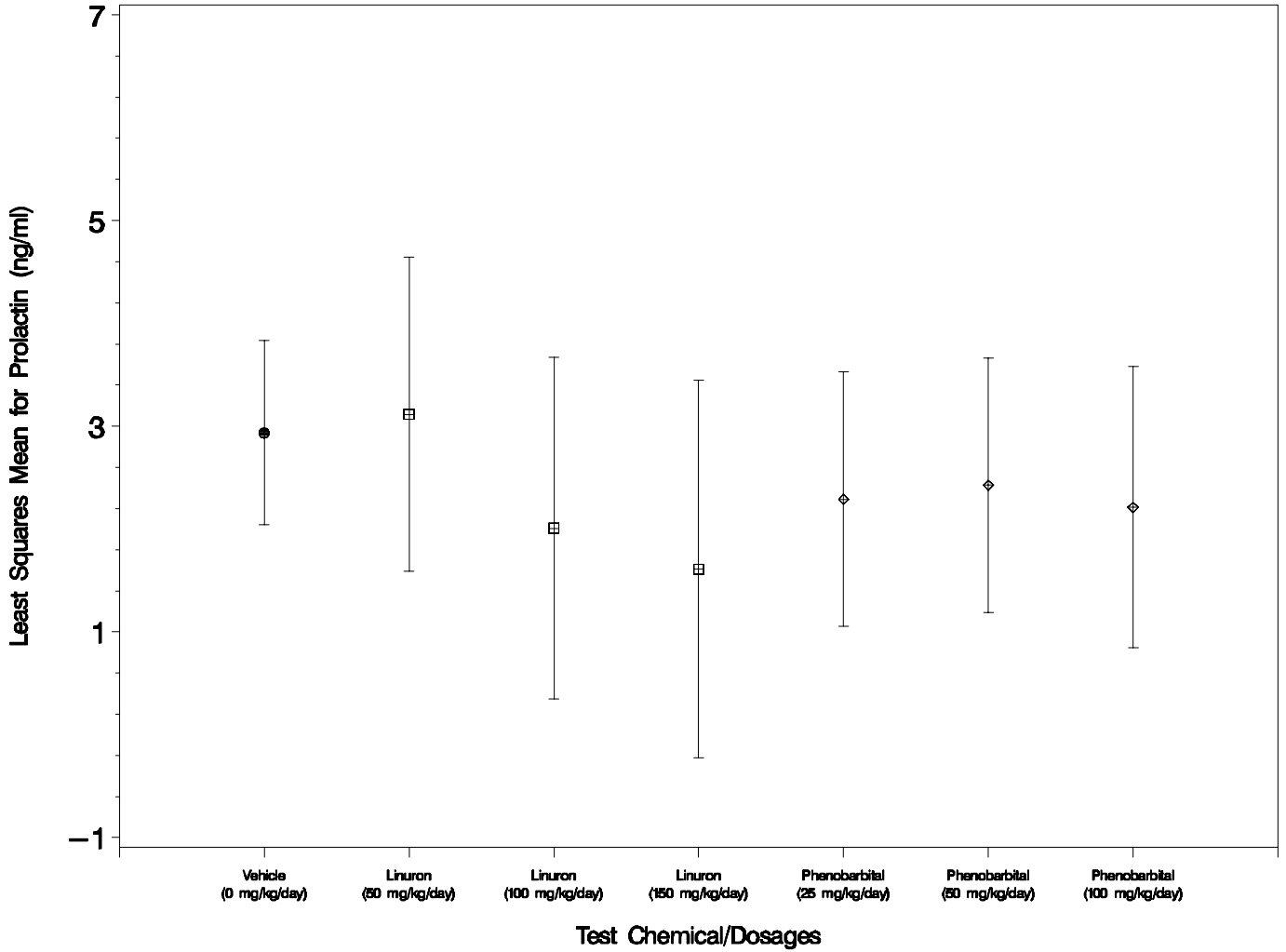


Figure 35. **<u>WIL Adult Males</u> Least Squares Means (with ± 2 Standard Error Bars) for Prolactin (ng/ml) for Each Dose Group (Significant Differences from Vehicle Control are Indicated by "*" for the 0.05 Level, and by "**" for the 0.05/8 Level).**

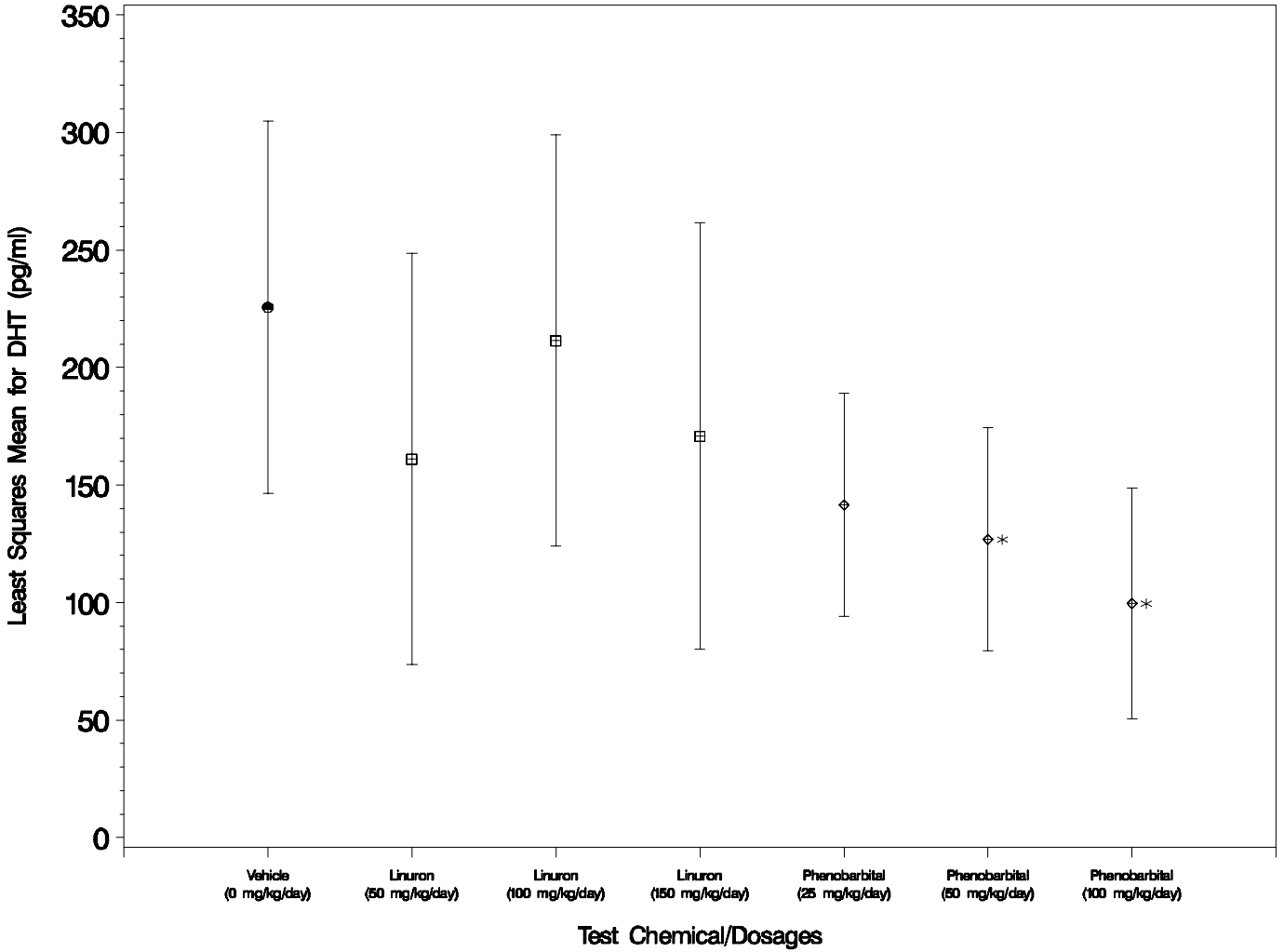


Figure 36. **<u>WIL Adult Males</u> Least Squares Means (with ± 2 Standard Error Bars) for DHT (pg/ml) for Each Dose Group (Significant Differences from Vehicle Control are Indicated by "*" for the 0.05 Level, and by "**" for the 0.05/8 Level).**

TABLES 1-9

Table 1. Likelihoods for Various Heterogeneous Covariance Structures, Likelihood Ratio Goodness of Fit Statistics, and Selections of Covariance Structure[1, 2].

Parameter	Selected Covariance Structure	TestChem* DoseLevel (T*D)	TestChem (T)	All (A)	(T*D)-(T)		(T)-(A)	
					Estimate	p_value (Chisq,df=4)	Estimate	p_value (Chisq,df=2)
ASG	All	-166.0	-164.6	-161.4	1.3759	0.84836	3.1679	0.20516
Body Weight Change (TD15-TD1)	All	333.4	335.9	336.7	2.5231	0.64051	0.7725	0.67961
Body Weight Change (TD15-TD8)	All	337.1	340.9	342.8	3.7261	0.44434	1.8811	0.39042
Body Weight Change (TD8-TD1)	T	414.1	419.2	428.1	5.1217	0.27504	8.9222	0.01155
DHT	T	1215.0	1223.8	1238.7	8.7748	0.06698	14.8950	0.00058
Entire Prostate	All	-341.6	-340.1	-339.1	1.5125	0.82442	1.0019	0.60595
Estradiol	All	702.2	708.0	708.3	5.8097	0.21382	0.2828	0.86814
FSH	T*D	461.7	473.2	478.2	11.4597	0.02186	5.0598	0.07967
Final Body Weight	All	885.8	893.0	895.5	7.2293	0.12425	2.4383	0.29549
Food Consumption (TD15-TD1)	T	549.2	551.0	560.9	1.8125	0.77020	9.8843	0.00714
Food Consumption (TD15-TD8)	T	607.4	611.0	622.3	3.6012	0.46265	11.2405	0.00362
Food Consumption (TD8-TD1)	T	632.3	635.4	659.5	3.1026	0.54081	24.0343	0.00001
LH	All	98.5	101.7	105.4	3.2338	0.51950	3.6742	0.15928
Left Testis	T*D	-325.9	-293.9	-284.0	31.9872	0.00000	9.9143	0.00703
Liver	All	54.9	63.2	66.7	8.2582	0.08256	3.5019	0.17361
Paired Epididymides	All	-400.4	-398.9	-398.4	1.4684	0.83222	0.5319	0.76650
Paired Testes	T	-217.7	-209.7	-202.0	7.9994	0.09160	7.7187	0.02108
Prolactin	T	254.0	263.4	272.4	9.4300	0.05121	9.0596	0.01078
Right Testis	T	-346.0	-338.2	-330.5	7.8142	0.09863	7.7345	0.02092
SeminalVesicleCoagGlandFluid	All	-219.5	-218.3	-212.6	1.1433	0.88734	5.7394	0.05672
T3	All	745.7	748.4	753.0	2.7005	0.60913	4.5776	0.10139
T4	T*D	220.2	245.6	247.2	25.3321	0.00004	1.5871	0.45223
TSH	T	674.6	676.0	697.6	1.4296	0.83904	21.6304	0.00002
Testosterone	T	534.1	536.9	552.3	2.7479	0.60086	15.4642	0.00044
Thyroid Glands	All	-1062.4	-1058.6	-1056.1	3.8523	0.42636	2.4556	0.29293

1. A one-way ANOVA model was fitted to the data separately for each parameter, in which test chemical and dosage level interaction (i.e., dose group) were fixed effects. For organ weight parameters, organ weight to final body weight ratios (%) were used. Outliers were excluded from the model fits.
2. Two heterogeneous covariance models and a homogenous covariance were compared. The steps for selecting a covariance structure were: starting from the most complex structure in (T*D), if (T*D) was significantly better than the next less complex one in (T), then (T*D) was picked. Otherwise comparing (T) with the homogenous model (All). If (T) was significantly better, then pick (T). If not, (All) was picked.

Table 2. Summary Statistics between Vehicle and Linuron in Adult Intact Male Assay for Body Weight Changes (g/day), Final Body Weight (g), and Food Consumptions (g/kg/day) for WIL Laboratories[1,2]

Parameter	Vehicle			Linuron (50 mg/kg/day)					Linear Trend[5]
	N	LS Mean (SE)	CV (%)	N	LS Mean(SE)	CV (%)	Diff from Vehicle[3]	Ratio to Vehicle (%)[4]	
Body Weight Change (TD8-TD1)	15	4.511 (0.332)	28.5	15	-0.975 (0.632)	-251.0	-5.487 (0.714)**	-21.617 (14.105)	-6.395 (0.531)**
Body Weight Change (TD15-TD8)	15	3.483 (0.338)	37.5	15	3.339 (0.338)	39.2	-0.144 (0.477)	95.871 (13.429)	-1.621 (0.343)**
Body Weight Change (TD15-TD1)	15	3.997 (0.327)	31.7	15	1.182 (0.327)	107.2	-2.815 (0.463)**	29.569 (8.533)	-4.008 (0.332)**
Final Body Weight (g)	15	388.333 (6.007)	6.0	15	349.067 (6.007)	6.7	-39.267 (8.495)**	89.888 (2.080)	-59.315 (6.103)**
Food Consumption (TD8-TD1)	15	76.067 (0.643)	3.3	14	62.786 (2.589)	15.4	-13.281 (2.668)**	82.540 (3.475)	-23.515 (2.026)**
Food Consumption (TD15-TD8)	14	68.500 (1.321)	7.2	14	68.857 (2.145)	11.7	0.357 (2.519)	100.521 (3.683)	-10.437 (1.817)**
Food Consumption (TD15-TD1)	14	72.143 (0.811)	4.2	13	65.231 (1.773)	9.8	-6.912 (1.949)**	90.419 (2.659)	-17.138 (1.419)**

1. Least squares means and standard errors were estimated based on a one-way ANOVA model applied to all data for each parameter.
2. CV was calculated as residual standard deviation/LS Mean.
3. Significant differences from the vehicle were indicated by "*" for the 0.05 level and "**" for the 0.05/8 level (a Bonferroni adjusted p-level).
4. Ratio to the vehicle was calculated as percent of vehicle group mean. The standard error for the ratio Y/X was $Se[R(X, Y)] \approx |1/X| [(Y/X)^2 S_X^2 + S_Y^2]^{½} \times 100\%$
5. Linear Contrast $\equiv [-3X_0 - X_1 + X_2 + 3X_3]/[20]^{½}$, where X_0 is vehicle, X_1, X_2, and X_3 are the low, mid, and high dosage levels of Linuron respectively. Significant dose trend was indicated by "*" for the 0.05 level and "**" for the 0.05/8 level.

Table 2(cont.). Summary Statistics between Vehicle and Linuron in Adult Intact Male Assay for Body Weight Changes (g/day), Final Body Weight (g), and Food Consumptions (g/kg/day) for WIL Laboratories[1,2]

Parameter	Vehicle			Linuron (100 mg/kg/day)					Linear Trend[5]
	N	LS Mean (SE)	CV (%)	N	LS Mean(SE)	CV (%)	Diff from Vehicle[3]	Ratio to Vehicle (%)[4]	
Body Weight Change (TD8-TD1)	15	4.511 (0.332)	28.5	15	-3.710 (0.632)	-66.0	-8.222 (0.714)**	-82.246 (15.268)	-6.395 (0.531)**
Body Weight Change (TD15-TD8)	15	3.483 (0.338)	37.5	15	2.257 (0.338)	57.9	-1.226 (0.477)*	64.807 (11.552)	-1.621 (0.343)**
Body Weight Change (TD15-TD1)	15	3.997 (0.327)	31.7	15	-0.727 (0.327)	-174	-4.724 (0.463)**	-18.180 (8.317)	-4.008 (0.332)**
Final Body Weight (g)	15	388.333 (6.007)	6.0	15	321.800 (6.007)	7.2	-66.533 (8.495)**	82.867 (2.009)	-59.315 (6.103)**
Food Consumption (TD8-TD1)	15	76.067 (0.643)	3.3	14	48.286 (2.589)	20.1	-27.781 (2.668)**	63.478 (3.446)	-23.515 (2.026)**
Food Consumption (TD15-TD8)	14	68.500 (1.321)	7.2	15	62.467 (2.072)	12.8	-6.033 (2.457)*	91.192 (3.499)	-10.437 (1.817)**
Food Consumption (TD15-TD1)	14	72.143 (0.811)	4.2	14	54.786 (1.708)	11.7	-17.357 (1.891)**	75.941 (2.517)	-17.138 (1.419)**

1. Least squares means and standard errors were estimated based on a one-way ANOVA model applied to all data for each parameter.
2. CV was calculated as residual standard deviation/LS Mean.
3. Significant differences from the vehicle were indicated by "*" for the 0.05 level and "**" for the 0.05/8 level (a Bonferroni adjusted p-level).
4. Ratio to the vehicle was calculated as percent of vehicle group mean. The standard error for the ratio Y/X was $Se[R(X, Y)] \approx |1/X| [(Y/X)^2 S_X^2 + S_Y^2]^{1/2} \times 100\%$
5. Linear Contrast $\equiv [-3X_0 - X_1 + X_2 + 3X_3]/[20]^{1/2}$, where X_0 is vehicle, X_1, X_2, and X_3 are the low, mid, and high dosage levels of Linuron respectively. Significant dose trend was indicated by "*" for the 0.05 level and "**" for the 0.05/8 level.

Table 2(cont.). Summary Statistics between Vehicle and Linuron in Adult Intact Male Assay for Body Weight Changes (g/day), Final Body Weight (g), and Food Consumptions (g/kg/day) for WIL Laboratories[1,2]

Parameter	Vehicle			Linuron (150 mg/kg/day)					Linear Trend[5]
	N	LS Mean (SE)	CV (%)	N	LS Mean(SE)	CV (%)	Diff from Vehicle[3]	Ratio to Vehicle (%)[4]	
Body Weight Change (TD8-TD1)	15	4.511 (0.332)	28.5	14	-4.110 (0.654)	-59.6	-8.622 (0.734)**	-91.106 (15.983)	-6.395 (0.531)**
Body Weight Change (TD15-TD8)	15	3.483 (0.338)	37.5	14	1.428 (0.349)	91.6	-2.055 (0.486)**	40.988 (10.792)	-1.621 (0.343)**
Body Weight Change (TD15-TD1)	15	3.997 (0.327)	31.7	14	-1.341 (0.339)	-94.4	-5.338 (0.471)**	-33.557 (8.904)	-4.008 (0.332)**
Final Body Weight (g)	15	388.333 (6.007)	6.0	14	309.000 (6.218)	7.5	-79.333 (8.645)**	79.571 (2.020)	-59.315 (6.103)**
Food Consumption (TD8-TD1)	15	76.067 (0.643)	3.3	13	45.846 (2.687)	21.1	-30.221 (2.763)**	60.271 (3.569)	-23.515 (2.026)**
Food Consumption (TD15-TD8)	14	68.500 (1.321)	7.2	14	55.071 (2.145)	14.6	-13.429 (2.519)**	80.396 (3.494)	-10.437 (1.817)**
Food Consumption (TD15-TD1)	14	72.143 (0.811)	4.2	13	50.077 (1.773)	12.8	-22.066 (1.949)**	69.414 (2.578)	-17.138 (1.419)**

1. Least squares means and standard errors were estimated based on a one-way ANOVA model applied to all data for each parameter.
2. CV was calculated as residual standard deviation/LS Mean.
3. Significant differences from the vehicle were indicated by "*" for the 0.05 level and "**" for the 0.05/8 level (a Bonferroni adjusted p-level).
4. Ratio to the vehicle was calculated as percent of vehicle group mean. The standard error for the ratio Y/X was $Se[R(X, Y)] \approx |1/X| [(Y/X)^2 S_X^2 + S_Y^2]^{½} \times 100\%$
5. Linear Contrast $\equiv [-3X_0 - X_1 + X_2 + 3X_3]/[20]^{½}$, where X_0 is vehicle, X_1, X_2, and X_3 are the low, mid, and high dosage levels of Linuron respectively. Significant dose trend was indicated by "*" for the 0.05 level and "**" for the 0.05/8 level.

Table 3. Summary Statistics between Vehicle and Phenobarbital in Adult Intact Male Assay for Body Weight Changes (g/day), Final Body Weight (g), and Food Consumptions (g/kg/day) for WIL Laboratories[1,2]

Parameter	Vehicle			Phenobarbital (25 mg/kg/day)					Linear Trend[5]
	N	LS Mean (SE)	CV (%)	N	LS Mean(SE)	CV (%)	Diff from Vehicle[3]	Ratio to Vehicle (%)[4]	
Body Weight Change (TD8-TD1)	15	4.511 (0.332)	28.5	15	4.435 (0.461)	40.2	-0.076 (0.568)	98.311 (12.517)	-2.224 (0.416)**
Body Weight Change (TD15-TD8)	15	3.483 (0.338)	37.5	15	3.637 (0.338)	36.0	0.154 (0.477)	104.430 (14.016)	0.157 (0.343)
Body Weight Change (TD15-TD1)	15	3.997 (0.327)	31.7	15	4.036 (0.327)	31.4	0.039 (0.463)	100.977 (11.629)	-1.033 (0.332)**
Final Body Weight (g)	15	388.333 (6.007)	6.0	15	387.333 (6.007)	6.0	-1.000 (8.495)	99.742 (2.185)	-14.316 (6.103)*
Food Consumption (TD8-TD1)	15	76.067 (0.643)	3.3	15	78.867 (1.853)	9.1	2.800 (1.962)	103.681 (2.589)	-3.066 (1.482)*
Food Consumption (TD15-TD8)	14	68.500 (1.321)	7.2	15	68.333 (1.254)	7.1	-0.167 (1.821)	99.757 (2.655)	2.380 (1.328)
Food Consumption (TD15-TD1)	14	72.143 (0.811)	4.2	15	73.333 (1.202)	6.3	1.190 (1.450)	101.650 (2.020)	-0.532 (1.096)

1. Least squares means and standard errors were estimated based on a one-way ANOVA model applied to all data for each parameter.
2. CV was calculated as residual standard deviation/LS Mean.
3. Significant differences from the vehicle were indicated by "*" for the 0.05 level and "**" for the 0.05/8 level (a Bonferroni adjusted p-level).
4. Ratio to the vehicle was calculated as percent of vehicle group mean. The standard error for the ratio Y/X was $Se[R(X, Y)] \approx |1/X| [(Y/X)^2 S_X^2 + S_Y^2]^{½} \times 100\%$
5. Linear Contrast $\equiv [-3X_0 - X_1 + X_2 + 3X_3]/[20]^{½}$, where X_0 is vehicle, X_1, X_2, and X_3 are the low, mid, and high dosage levels of Phenobarbital respectively. Significant dose trend was indicated by "*" for the 0.05 level and "**" for the 0.05/8 level.

Table 3(cont.). Summary Statistics between Vehicle and Phenobarbital in Adult Intact Male Assay for Body Weight Changes (g/day), Final Body Weight (g), and Food Consumptions (g/kg/day) for WIL Laboratories[1,2]

Parameter	Vehicle			Phenobarbital (50 mg/kg/day)					Linear Trend[5]
	N	LS Mean (SE)	CV (%)	N	LS Mean(SE)	CV (%)	Diff from Vehicle[3]	Ratio to Vehicle (%)[4]	
Body Weight Change (TD8-TD1)	15	4.511 (0.332)	28.5	15	4.015 (0.461)	44.4	-0.496 (0.568)	89.001 (12.133)	-2.224 (0.416)**
Body Weight Change (TD15-TD8)	15	3.483 (0.338)	37.5	15	3.213 (0.338)	40.7	-0.270 (0.477)	92.261 (13.190)	0.157 (0.343)
Body Weight Change (TD15-TD1)	15	3.997 (0.327)	31.7	15	3.614 (0.327)	35.0	-0.383 (0.463)	90.422 (11.032)	-1.033 (0.332)**
Final Body Weight (g)	15	388.333 (6.007)	6.0	15	380.667 (6.007)	6.1	-7.667 (8.495)	98.026 (2.166)	-14.316 (6.103)*
Food Consumption (TD8-TD1)	15	76.067 (0.643)	3.3	14	79.929 (1.918)	9.0	3.862 (2.023)	105.077 (2.674)	-3.066 (1.482)*
Food Consumption (TD15-TD8)	14	68.500 (1.321)	7.2	14	67.786 (1.298)	7.2	-0.714 (1.852)	98.957 (2.689)	2.380 (1.328)
Food Consumption (TD15-TD1)	14	72.143 (0.811)	4.2	13	72.538 (1.291)	6.4	0.396 (1.525)	100.548 (2.117)	-0.532 (1.096)

1. Least squares means and standard errors were estimated based on a one-way ANOVA model applied to all data for each parameter.
2. CV was calculated as residual standard deviation/LS Mean.
3. Significant differences from the vehicle were indicated by "*" for the 0.05 level and "**" for the 0.05/8 level (a Bonferroni adjusted p-level).
4. Ratio to the vehicle was calculated as percent of vehicle group mean. The standard error for the ratio Y/X was $Se[R(X, Y)] \approx |1/X| [(Y/X)^2 S_X^2 + S_Y^2]^{½} \times 100\%$
5. Linear Contrast $\equiv [-3X_0 - X_1 + X_2 + 3X_3]/[20]^{½}$, where X_0 is vehicle, X_1, X_2, and X_3 are the low, mid, and high dosage levels of Phenobarbital respectively. Significant dose trend was indicated by "*" for the 0.05 level and "**" for the 0.05/8 level.

Table 3(cont.). Summary Statistics between Vehicle and Phenobarbital in Adult Intact Male Assay for Body Weight Changes (g/day), Final Body Weight (g), and Food Consumptions (g/kg/day) for WIL Laboratories[1,2]

Parameter	Vehicle			Phenobarbital (100 mg/kg/day)					Linear Trend[5]
	N	LS Mean (SE)	CV (%)	N	LS Mean(SE)	CV (%)	Diff from Vehicle[3]	Ratio to Vehicle (%)[4]	
Body Weight Change (TD8-TD1)	15	4.511 (0.332)	28.5	14	1.337 (0.477)	133.5	-3.175 (0.581)**	29.630 (10.791)	-2.224 (0.416)**
Body Weight Change (TD15-TD8)	15	3.483 (0.338)	37.5	14	3.858 (0.349)	33.9	0.375 (0.486)	110.776 (14.697)	0.157 (0.343)
Body Weight Change (TD15-TD1)	15	3.997 (0.327)	31.7	14	2.597 (0.339)	48.8	-1.400 (0.471)**	64.983 (10.001)	-1.033 (0.332)**
Final Body Weight (g)	15	388.333 (6.007)	6.0	14	369.214 (6.218)	6.3	-19.119 (8.645)*	95.077 (2.174)	-14.316 (6.103)*
Food Consumption (TD8-TD1)	15	76.067 (0.643)	3.3	14	71.143 (1.918)	10.1	-4.924 (2.023)*	93.527 (2.643)	-3.066 (1.482)*
Food Consumption (TD15-TD8)	14	68.500 (1.321)	7.2	13	72.231 (1.347)	6.7	3.731 (1.887)	105.446 (2.829)	2.380 (1.328)
Food Consumption (TD15-TD1)	14	72.143 (0.811)	4.2	13	71.615 (1.291)	6.5	-0.527 (1.525)	99.269 (2.109)	-0.532 (1.096)

1. Least squares means and standard errors were estimated based on a one-way ANOVA model applied to all data for each parameter.
2. CV was calculated as residual standard deviation/LS Mean.
3. Significant differences from the vehicle were indicated by "*" for the 0.05 level and "**" for the 0.05/8 level (a Bonferroni adjusted p-level).
4. Ratio to the vehicle was calculated as percent of vehicle group mean. The standard error for the ratio Y/X was $Se[R(X, Y)] \approx |1/X| [(Y/X)^2 S_X^2 + S_Y^2]^{½} \times 100\%$
5. Linear Contrast $\equiv [-3X_0 - X_1 + X_2 + 3X_3]/[20]^{½}$, where X_0 is vehicle, X_1, X_2, and X_3 are the low, mid, and high dosage levels of Phenobarbital respectively. Significant dose trend was indicated by "*" for the 0.05 level and "**" for the 0.05/8 level.

Table 4. Summary Statistics between Vehicle and Linuron in Adult Intact Male Assay for Unadjusted Organ Weights (g) and Adjusted Organ Weights for WIL Laboratories[1,2,6]

Parameter	Vehicle			Linuron (50 mg/kg/day)					Linear Trend[5]
	N	LS Mean (SE)	CV (%)	N	LS Mean(SE)	CV (%)	Diff from Vehicle[3]	Ratio to Vehicle (%)[4]	
Liver	15	14.251 (0.456)	12.4	15	14.030 (0.456)	12.6	-0.220 (0.645)	98.455 (4.489)	-1.212 (0.463)*
Right Testis	15	1.668 (0.024)	5.6	15	1.687 (0.030)	7.0	0.019 (0.039)	101.162 (2.335)	-0.043 (0.028)
Left Testis	15	1.658 (0.024)	5.7	15	1.689 (0.039)	9.0	0.031 (0.046)	101.868 (2.809)	-0.062 (0.025)*
Paired Testes	15	3.326 (0.048)	5.6	15	3.376 (0.061)	7.0	0.050 (0.077)	101.514 (2.332)	-0.105 (0.056)
Paired Epididymides	15	1.007 (0.022)	8.5	15	0.967 (0.022)	8.8	-0.040 (0.031)	96.029 (3.035)	-0.054 (0.022)*
Entire Prostate	15	0.771 (0.035)	17.8	15	0.639 (0.035)	21.5	-0.131 (0.050)*	82.958 (5.979)	-0.144 (0.036)**
Seminal Vesicles with fluid and Coagulating Gland	15	1.648 (0.066)	15.5	15	1.365 (0.066)	18.7	-0.284 (0.093)**	82.787 (5.201)	-0.301 (0.067)**
Accessory Sex Gland	15	2.419 (0.087)	14.0	15	2.004 (0.087)	16.9	-0.415 (0.123)**	82.842 (4.687)	-0.445 (0.089)**
Thyroid Glands	15	0.020 (0.001)	16.0	15	0.020 (0.001)	16.1	-0.000 (0.001)	99.472 (5.830)	-0.001 (0.001)
Adj Liver	15	3.666 (0.080)	8.5	15	4.014 (0.080)	7.7	0.348 (0.113)**	109.488 (3.243)	0.322 (0.081)**
Adj Right Testis	15	0.430 (0.007)	5.9	15	0.484 (0.012)	9.6	0.054 (0.014)**	112.578 (3.266)	0.070 (0.010)**
Adj Left Testis	15	0.428 (0.007)	6.4	15	0.485 (0.010)	8.4	0.057 (0.013)**	113.241 (3.082)	0.063 (0.009)**
Adj Paired Testes	15	0.858 (0.013)	6.0	15	0.969 (0.024)	9.4	0.111 (0.027)**	112.908 (3.266)	0.133 (0.020)**
Adj Paired Epididymides	15	0.260 (0.007)	10.6	15	0.278 (0.007)	9.9	0.018 (0.010)	107.051 (4.012)	0.032 (0.007)**
Adj Entire Prostate	15	0.199 (0.010)	18.9	15	0.184 (0.010)	20.3	-0.014 (0.014)	92.772 (6.649)	-0.009 (0.010)
Adj Seminal Vesicles with fluid and Coagulating Gland	15	0.426 (0.019)	17.0	15	0.392 (0.019)	18.5	-0.034 (0.026)	92.129 (5.975)	-0.019 (0.019)
Adj Accessory Sex Gland	15	0.625 (0.024)	15.1	15	0.577 (0.024)	16.4	-0.048 (0.035)	92.334 (5.323)	-0.028 (0.025)
Adj Thyroid Glands	15	0.005 (0.000)	17.2	15	0.006 (0.000)	15.5	0.001 (0.000)	110.553 (6.611)	0.001 (0.000)**

1. Least squares means and standard errors were estimated based on a one-way ANOVA model applied to all data for each parameter.
2. CV was calculated as residual standard deviation/LS Mean.
3. Significant differences from the vehicle were indicated by "*" for the 0.05 level and "**" for the 0.05/8 level (a Bonferroni adjusted p-level).
4. Ratio to the vehicle was calculated as percent of vehicle group mean. The standard error for the ratio Y/X was $Se[R(X, Y)] \approx |1/X| [(Y/X)^2 S_X^2 + S_Y^2]^{½} \times 100\%$
5. Linear Contrast $\equiv [-3X_0 – X_1 + X_2 + 3X_3]/[20]^{½,}$ where X_0 is vehicle, X_1, X_2, and X_3 are the low, mid, and high dosage levels. Significant dose trend was indicated by "*" for the 0.05 level and "**" for the 0.05/8 level.
6. Adjusted organ weights are defined as organ weight to final body weight ratios (expressed as %).

Table 4(cont.). Summary Statistics between Vehicle and Linuron in Adult Intact Male Assay for Unadjusted Organ Weights (g) and Adjusted Organ Weights for WIL Laboratories[1,2,6]

Parameter	Vehicle			Linuron (100 mg/kg/day)					Linear Trend[5]
	N	LS Mean (SE)	CV (%)	N	LS Mean(SE)	CV (%)	Diff from Vehicle[3]	Ratio to Vehicle (%)[4]	
Liver	15	14.251 (0.456)	12.4	15	13.265 (0.456)	13.3	-0.986 (0.645)	93.083 (4.370)	-1.212 (0.463)*
Right Testis	15	1.668 (0.024)	5.6	15	1.589 (0.030)	7.4	-0.079 (0.039)*	95.276 (2.283)	-0.043 (0.028)
Left Testis	15	1.658 (0.024)	5.7	15	1.571 (0.031)	7.6	-0.087 (0.039)*	94.745 (2.333)	-0.062 (0.025)*
Paired Testes	15	3.326 (0.048)	5.6	15	3.160 (0.061)	7.4	-0.166 (0.077)*	95.011 (2.275)	-0.105 (0.056)
Paired Epididymides	15	1.007 (0.022)	8.5	15	0.903 (0.022)	9.5	-0.104 (0.031)**	89.661 (2.940)	-0.054 (0.022)*
Entire Prostate	15	0.771 (0.035)	17.8	15	0.541 (0.035)	25.4	-0.230 (0.050)**	70.167 (5.621)	-0.144 (0.036)**
Seminal Vesicles with fluid and Coagulating Gland	15	1.648 (0.066)	15.5	15	1.182 (0.066)	21.6	-0.466 (0.093)**	71.731 (4.930)	-0.301 (0.067)**
Accessory Sex Gland	15	2.419 (0.087)	14.0	15	1.723 (0.087)	19.6	-0.696 (0.123)**	71.233 (4.431)	-0.445 (0.089)**
Thyroid Glands	15	0.020 (0.001)	16.0	15	0.020 (0.001)	16.2	-0.000 (0.001)	98.516 (5.802)	-0.001 (0.001)
Adj Liver	15	3.666 (0.080)	8.5	15	4.115 (0.080)	7.5	0.449 (0.113)**	112.244 (3.287)	0.322 (0.081)**
Adj Right Testis	15	0.430 (0.007)	5.9	15	0.497 (0.012)	9.3	0.067 (0.014)**	115.522 (3.290)	0.070 (0.010)**
Adj Left Testis	15	0.428 (0.007)	6.4	15	0.492 (0.016)	12.3	0.064 (0.017)**	114.869 (4.101)	0.063 (0.009)**
Adj Paired Testes	15	0.858 (0.013)	6.0	15	0.989 (0.024)	9.3	0.130 (0.027)**	115.196 (3.285)	0.133 (0.020)**
Adj Paired Epididymides	15	0.260 (0.007)	10.6	15	0.282 (0.007)	9.8	0.022 (0.010)*	108.590 (4.043)	0.032 (0.007)**
Adj Entire Prostate	15	0.199 (0.010)	18.9	15	0.168 (0.010)	22.3	-0.031 (0.014)*	84.542 (6.383)	-0.009 (0.010)
Adj Seminal Vesicles with fluid and Coagulating Gland	15	0.426 (0.019)	17.0	15	0.367 (0.019)	19.8	-0.059 (0.026)*	86.055 (5.797)	-0.019 (0.019)
Adj Accessory Sex Gland	15	0.625 (0.024)	15.1	15	0.535 (0.024)	17.7	-0.090 (0.035)*	85.574 (5.148)	-0.028 (0.025)
Adj Thyroid Glands	15	0.005 (0.000)	17.2	15	0.006 (0.000)	14.5	0.001 (0.000)**	118.374 (6.873)	0.001 (0.000)**

1. Least squares means and standard errors were estimated based on a one-way ANOVA model applied to all data for each parameter.
2. CV was calculated as residual standard deviation/LS Mean.
3. Significant differences from the vehicle were indicated by "*" for the 0.05 level and "**" for the 0.05/8 level (a Bonferroni adjusted p-level).
4. Ratio to the vehicle was calculated as percent of vehicle group mean. The standard error for the ratio Y/X was $Se[R(X, Y)] \approx |1/X| [(Y/X)^2 S_X^2 + S_Y^2]^{½} \times 100\%$
5. Linear Contrast $\equiv [-3X_0 – X_1 + X_2 + 3X_3]/[20]^{½,}$ where X_0 is vehicle, X_1, X_2, and X_3 are the low, mid, and high dosage levels. Significant dose trend was indicated by "*" for the 0.05 level and "**" for the 0.05/8 level.
6. Adjusted organ weights are defined as organ weight to final body weight ratios (expressed as %).

Table 4(cont.). Summary Statistics between Vehicle and Linuron in Adult Intact Male Assay for Unadjusted Organ Weights (g) and Adjusted Organ Weights for WIL Laboratories[1,2,6]

Parameter	Vehicle			Linuron (150 mg/kg/day)					Linear Trend[5]
	N	LS Mean (SE)	CV (%)	N	LS Mean(SE)	CV (%)	Diff from Vehicle[3]	Ratio to Vehicle (%)[4]	
Liver	15	14.251 (0.456)	12.4	14	12.700 (0.472)	13.9	-1.551 (0.656)*	89.117 (4.369)	-1.212 (0.463)*
Right Testis	15	1.668 (0.024)	5.6	14	1.636 (0.031)	7.2	-0.031 (0.040)	98.139 (2.358)	-0.043 (0.028)
Left Testis	15	1.658 (0.024)	5.7	14	1.605 (0.022)	5.1	-0.053 (0.033)	96.795 (1.944)	-0.062 (0.025)*
Paired Testes	15	3.326 (0.048)	5.6	14	3.241 (0.063)	7.2	-0.084 (0.079)	97.469 (2.347)	-0.105 (0.056)
Paired Epididymides	15	1.007 (0.022)	8.5	14	0.947 (0.023)	9.0	-0.060 (0.032)	94.063 (3.062)	-0.054 (0.022)*
Entire Prostate	15	0.771 (0.035)	17.8	14	0.588 (0.037)	23.3	-0.182 (0.051)**	76.330 (5.918)	-0.144 (0.036)**
Seminal Vesicles with fluid and Coagulating Gland	15	1.648 (0.066)	15.5	14	1.261 (0.068)	20.3	-0.387 (0.095)**	76.494 (5.156)	-0.301 (0.067)**
Accessory Sex Gland	15	2.419 (0.087)	14.0	14	1.849 (0.090)	18.3	-0.570 (0.126)**	76.442 (4.644)	-0.445 (0.089)**
Thyroid Glands	15	0.020 (0.001)	16.0	14	0.020 (0.001)	16.6	-0.001 (0.001)	96.577 (5.851)	-0.001 (0.001)
Adj Liver	15	3.666 (0.080)	8.5	14	4.112 (0.083)	7.6	0.446 (0.115)**	112.162 (3.338)	0.322 (0.081)**
Adj Right Testis	15	0.430 (0.007)	5.9	14	0.530 (0.012)	8.8	0.100 (0.014)**	123.251 (3.435)	0.070 (0.010)**
Adj Left Testis	15	0.428 (0.007)	6.4	14	0.520 (0.009)	6.3	0.092 (0.011)**	121.547 (2.863)	0.063 (0.009)**
Adj Paired Testes	15	0.858 (0.013)	6.0	14	1.050 (0.024)	8.7	0.192 (0.028)**	122.402 (3.427)	0.133 (0.020)**
Adj Paired Epididymides	15	0.260 (0.007)	10.6	14	0.307 (0.007)	9.0	0.047 (0.010)**	118.141 (4.302)	0.032 (0.007)**
Adj Entire Prostate	15	0.199 (0.010)	18.9	14	0.190 (0.010)	19.7	-0.009 (0.014)	95.662 (6.870)	-0.009 (0.010)
Adj Seminal Vesicles with fluid and Coagulating Gland	15	0.426 (0.019)	17.0	14	0.406 (0.019)	17.8	-0.020 (0.027)	95.383 (6.185)	-0.019 (0.019)
Adj Accessory Sex Gland	15	0.625 (0.024)	15.1	14	0.596 (0.025)	15.9	-0.028 (0.035)	95.472 (5.508)	-0.028 (0.025)
Adj Thyroid Glands	15	0.005 (0.000)	17.2	14	0.006 (0.000)	14.2	0.001 (0.000)**	120.993 (7.062)	0.001 (0.000)**

1. Least squares means and standard errors were estimated based on a one-way ANOVA model applied to all data for each parameter.
2. CV was calculated as residual standard deviation/LS Mean.
3. Significant differences from the vehicle were indicated by "*" for the 0.05 level and "**" for the 0.05/8 level (a Bonferroni adjusted p-level).
4. Ratio to the vehicle was calculated as percent of vehicle group mean. The standard error for the ratio Y/X was $Se[R(X, Y)] \approx |1/X| [(Y/X)^2 S_X^2 + S_Y^2]^{½} \times 100\%$
5. Linear Contrast $\equiv [-3X_0 – X_1 + X_2 + 3X_3]/[20]^{½,}$ where X_0 is vehicle, X_1, X_2, and X_3 are the low, mid, and high dosage levels. Significant dose trend was indicated by "*" for the 0.05 level and "**" for the 0.05/8 level.
6. Adjusted organ weights are defined as organ weight to final body weight ratios (expressed as %).

Table 5. Summary Statistics between Vehicle and Phenobarbital in Adult Intact Male Assay for for Unadjusted Organ Weights (g) and Adjusted Organ Weights for WIL Laboratories[1,2,6]

Parameter	Vehicle			Phenobarbital (25 mg/kg/day)					Linear Trend[5]
	N	LS Mean (SE)	CV (%)	N	LS Mean(SE)	CV (%)	Diff from Vehicle[3]	Ratio to Vehicle (%)[4]	
Liver	15	14.251 (0.456)	12.4	15	17.347 (0.456)	10.2	3.097 (0.645)**	121.730 (5.040)	3.930 (0.463)**
Right Testis	15	1.668 (0.024)	5.6	15	1.645 (0.035)	8.3	-0.023 (0.043)	98.628 (2.559)	-0.039 (0.031)
Left Testis	15	1.658 (0.024)	5.7	15	1.645 (0.029)	6.8	-0.013 (0.038)	99.213 (2.271)	-0.059 (0.034)
Paired Testes	15	3.326 (0.048)	5.6	15	3.290 (0.070)	8.2	-0.036 (0.084)	98.920 (2.528)	-0.098 (0.062)
Paired Epididymides	15	1.007 (0.022)	8.5	15	1.002 (0.022)	8.5	-0.005 (0.031)	99.457 (3.088)	0.018 (0.022)
Entire Prostate	15	0.771 (0.035)	17.8	15	0.803 (0.035)	17.1	0.032 (0.050)	104.195 (6.646)	0.040 (0.036)
Seminal Vesicles with fluid and Coagulating Gland	15	1.648 (0.066)	15.5	15	1.571 (0.066)	16.3	-0.077 (0.093)	95.302 (5.534)	0.087 (0.067)
Accessory Sex Gland	15	2.419 (0.087)	14.0	15	2.374 (0.087)	14.2	-0.045 (0.123)	98.136 (5.057)	0.126 (0.089)
Thyroid Glands	15	0.020 (0.001)	16.0	15	0.026 (0.001)	12.3	0.006 (0.001)**	129.716 (6.769)	0.004 (0.001)**
Adj Liver	15	3.666 (0.080)	8.5	15	4.474 (0.080)	6.9	0.808 (0.113)**	122.031 (3.450)	1.197 (0.081)**
Adj Right Testis	15	0.430 (0.007)	5.9	15	0.426 (0.009)	8.2	-0.004 (0.011)	98.984 (2.583)	0.006 (0.008)
Adj Left Testis	15	0.428 (0.007)	6.4	15	0.426 (0.007)	6.5	-0.002 (0.010)	99.525 (2.348)	0.000 (0.009)
Adj Paired Testes	15	0.858 (0.013)	6.0	15	0.852 (0.017)	7.8	-0.006 (0.022)	99.253 (2.534)	0.006 (0.016)
Adj Paired Epididymides	15	0.260 (0.007)	10.6	15	0.260 (0.007)	10.6	0.000 (0.010)	100.041 (3.874)	0.015 (0.007)*
Adj Entire Prostate	15	0.199 (0.010)	18.9	15	0.207 (0.010)	18.1	0.009 (0.014)	104.398 (7.047)	0.018 (0.010)
Adj Seminal Vesicles with fluid and Coagulating Gland	15	0.426 (0.019)	17.0	15	0.408 (0.019)	17.8	-0.018 (0.026)	95.695 (6.082)	0.038 (0.019)*
Adj Accessory Sex Gland	15	0.625 (0.024)	15.1	15	0.615 (0.024)	15.4	-0.010 (0.035)	98.464 (5.489)	0.057 (0.025)*
Adj Thyroid Glands	15	0.005 (0.000)	17.2	15	0.007 (0.000)	13.1	0.002 (0.000)**	130.920 (7.307)	0.001 (0.000)**

1. Least squares means and standard errors were estimated based on a one-way ANOVA model applied to all data for each parameter.
2. CV was calculated as residual standard deviation/LS Mean.
3. Significant differences from the vehicle were indicated by "*" for the 0.05 level and "**" for the 0.05/8 level (a Bonferroni adjusted p-level).
4. Ratio to the vehicle was calculated as percent of vehicle group mean. The standard error for the ratio Y/X was $Se[R(X, Y)] \approx |1/X| [(Y/X)^2 S_X^2 + S_Y^2]^{½} \times 100\%$
5. Linear Contrast $\equiv [-3X_0 – X_1 + X_2 + 3X_3]/[20]^{½,}$ where X_0 is vehicle, X_1, X_2, and X_3 are the low, mid, and high dosage levels. Significant dose trend was indicated by "*" for the 0.05 level and "**" for the 0.05/8 level.
6. Adjusted organ weights are defined as organ weight to final body weight ratios (expressed as %).

Table 5(cont.). Summary Statistics between Vehicle and Phenobarbital in Adult Intact Male Assay for Unadjusted Organ Weights (g) and Adjusted Organ Weights for WIL Laboratories[1,2,6]

Parameter	Vehicle			Phenobarbital (50 mg/kg/day)					Linear Trend[5]
	N	LS Mean (SE)	CV (%)	N	LS Mean(SE)	CV (%)	Diff from Vehicle[3]	Ratio to Vehicle (%)[4]	
Liver	15	14.251 (0.456)	12.4	15	18.216 (0.456)	9.7	3.965 (0.645)**	127.826 (5.192)	3.930 (0.463)**
Right Testis	15	1.668 (0.024)	5.6	15	1.667 (0.035)	8.2	-0.001 (0.043)	99.939 (2.570)	-0.039 (0.031)
Left Testis	15	1.658 (0.024)	5.7	15	1.536 (0.093)	23.5	-0.122 (0.096)	92.664 (5.777)	-0.059 (0.034)
Paired Testes	15	3.326 (0.048)	5.6	15	3.203 (0.070)	8.4	-0.123 (0.084)	96.312 (2.507)	-0.098 (0.062)
Paired Epididymides	15	1.007 (0.022)	8.5	15	1.023 (0.022)	8.3	0.016 (0.031)	101.626 (3.121)	0.018 (0.022)
Entire Prostate	15	0.771 (0.035)	17.8	15	0.867 (0.035)	15.8	0.096 (0.050)	112.466 (6.925)	0.040 (0.036)
Seminal Vesicles with fluid and Coagulating Gland	15	1.648 (0.066)	15.5	15	1.686 (0.066)	15.2	0.038 (0.093)	102.301 (5.731)	0.087 (0.067)
Accessory Sex Gland	15	2.419 (0.087)	14.0	15	2.553 (0.087)	13.2	0.134 (0.123)	105.539 (5.247)	0.126 (0.089)
Thyroid Glands	15	0.020 (0.001)	16.0	15	0.026 (0.001)	12.2	0.006 (0.001)**	131.003 (6.812)	0.004 (0.001)**
Adj Liver	15	3.666 (0.080)	8.5	15	4.782 (0.080)	6.5	1.116 (0.113)**	130.429 (3.594)	1.197 (0.081)**
Adj Right Testis	15	0.430 (0.007)	5.9	15	0.438 (0.009)	8.0	0.008 (0.011)	101.826 (2.608)	0.006 (0.008)
Adj Left Testis	15	0.428 (0.007)	6.4	15	0.404 (0.024)	22.9	-0.024 (0.025)	94.315 (5.796)	0.000 (0.009)
Adj Paired Testes	15	0.858 (0.013)	6.0	15	0.842 (0.017)	7.9	-0.016 (0.022)	98.081 (2.523)	0.006 (0.016)
Adj Paired Epididymides	15	0.260 (0.007)	10.6	15	0.269 (0.007)	10.2	0.010 (0.010)	103.762 (3.947)	0.015 (0.007)*
Adj Entire Prostate	15	0.199 (0.010)	18.9	15	0.229 (0.010)	16.4	0.030 (0.014)*	115.042 (7.430)	0.018 (0.010)
Adj Seminal Vesicles with fluid and Coagulating Gland	15	0.426 (0.019)	17.0	15	0.444 (0.019)	16.3	0.018 (0.026)	104.185 (6.346)	0.038 (0.019)*
Adj Accessory Sex Gland	15	0.625 (0.024)	15.1	15	0.672 (0.024)	14.1	0.048 (0.035)	107.639 (5.746)	0.057 (0.025)*
Adj Thyroid Glands	15	0.005 (0.000)	17.2	15	0.007 (0.000)	12.9	0.002 (0.000)**	133.451 (7.396)	0.001 (0.000)**

1. Least squares means and standard errors were estimated based on a one-way ANOVA model applied to all data for each parameter.
2. CV was calculated as residual standard deviation/LS Mean.
3. Significant differences from the vehicle were indicated by "*" for the 0.05 level and "**" for the 0.05/8 level (a Bonferroni adjusted p-level).
4. Ratio to the vehicle was calculated as percent of vehicle group mean. The standard error for the ratio Y/X was $Se[R(X, Y)] \approx |1/X| [(Y/X)^2 S_X^2 + S_Y^2]^{½} \times 100\%$
5. Linear Contrast $\equiv [-3X_0 - X_1 + X_2 + 3X_3]/[20]^{½}$, where X_0 is vehicle, X_1, X_2, and X_3 are the low, mid, and high dosage levels. Significant dose trend was indicated by "*" for the 0.05 level and "**" for the 0.05/8 level.
6. Adjusted organ weights are defined as organ weight to final body weight ratios (expressed as %).

Table 5(cont.). Summary Statistics between Vehicle and Phenobarbital in Adult Intact Male Assay for Unadjusted Organ Weights (g) and Adjusted Organ Weights for WIL Laboratories[1,2,6]

Parameter	Vehicle			Phenobarbital (100 mg/kg/day)					Linear Trend[5]
	N	LS Mean (SE)	CV (%)	N	LS Mean(SE)	CV (%)	Diff from Vehicle[3]	Ratio to Vehicle (%)[4]	
Liver	15	14.251 (0.456)	12.4	14	19.819 (0.472)	8.9	5.568 (0.656)**	139.074 (5.546)	3.930 (0.463)**
Right Testis	15	1.668 (0.024)	5.6	14	1.601 (0.037)	8.6	-0.066 (0.044)	96.039 (2.601)	-0.039 (0.031)
Left Testis	15	1.658 (0.024)	5.7	14	1.607 (0.029)	6.8	-0.051 (0.038)	96.899 (2.275)	-0.059 (0.034)
Paired Testes	15	3.326 (0.048)	5.6	14	3.208 (0.072)	8.4	-0.117 (0.086)	96.468 (2.570)	-0.098 (0.062)
Paired Epididymides	15	1.007 (0.022)	8.5	14	1.027 (0.023)	8.3	0.020 (0.032)	102.006 (3.182)	0.018 (0.022)
Entire Prostate	15	0.771 (0.035)	17.8	14	0.809 (0.037)	17.0	0.038 (0.051)	104.957 (6.783)	0.040 (0.036)
Seminal Vesicles with fluid and Coagulating Gland	15	1.648 (0.066)	15.5	14	1.739 (0.068)	14.7	0.091 (0.095)	105.493 (5.921)	0.087 (0.067)
Accessory Sex Gland	15	2.419 (0.087)	14.0	14	2.548 (0.090)	13.3	0.129 (0.126)	105.322 (5.330)	0.126 (0.089)
Thyroid Glands	15	0.020 (0.001)	16.0	14	0.026 (0.001)	12.4	0.006 (0.001)**	129.229 (6.843)	0.004 (0.001)**
Adj Liver	15	3.666 (0.080)	8.5	14	5.348 (0.083)	5.8	1.682 (0.115)**	145.885 (3.912)	1.197 (0.081)**
Adj Right Testis	15	0.430 (0.007)	5.9	14	0.435 (0.009)	8.1	0.004 (0.011)	101.011 (2.661)	0.006 (0.008)
Adj Left Testis	15	0.428 (0.007)	6.4	14	0.436 (0.008)	6.6	0.008 (0.010)	101.899 (2.469)	0.000 (0.009)
Adj Paired Testes	15	0.858 (0.013)	6.0	14	0.871 (0.018)	7.7	0.012 (0.022)	101.454 (2.611)	0.006 (0.016)
Adj Paired Epididymides	15	0.260 (0.007)	10.6	14	0.279 (0.007)	9.9	0.020 (0.010)	107.526 (4.088)	0.015 (0.007)*
Adj Entire Prostate	15	0.199 (0.010)	18.9	14	0.219 (0.010)	17.1	0.020 (0.014)	110.247 (7.371)	0.018 (0.010)
Adj Seminal Vesicles with fluid and Coagulating Gland	15	0.426 (0.019)	17.0	14	0.471 (0.019)	15.4	0.045 (0.027)	110.574 (6.656)	0.038 (0.019)*
Adj Accessory Sex Gland	15	0.625 (0.024)	15.1	14	0.690 (0.025)	13.7	0.065 (0.035)	110.470 (5.921)	0.057 (0.025)*
Adj Thyroid Glands	15	0.005 (0.000)	17.2	14	0.007 (0.000)	12.7	0.002 (0.000)**	135.448 (7.561)	0.001 (0.000)**

1. Least squares means and standard errors were estimated based on a one-way ANOVA model applied to all data for each parameter.
2. CV was calculated as residual standard deviation/LS Mean.
3. Significant differences from the vehicle were indicated by "*" for the 0.05 level and "**" for the 0.05/8 level (a Bonferroni adjusted p-level).
4. Ratio to the vehicle was calculated as percent of vehicle group mean. The standard error for the ratio Y/X was $Se[R(X, Y)] \approx |1/X| [(Y/X)^2 S_X^2 + S_Y^2]^{½} \times 100\%$
5. Linear Contrast $\equiv [-3X_0 - X_1 + X_2 + 3X_3]/[20]^{½}$, where X_0 is vehicle, X_1, X_2, and X_3 are the low, mid, and high dosage levels. Significant dose trend was indicated by "*" for the 0.05 level and "**" for the 0.05/8 level.
6. Adjusted organ weights are defined as organ weight to final body weight ratios (expressed as %).

Table 6. Summary Statistics between Vehicle and Linuron in Adult Intact Male Assay for Hormonal Parameters for WIL Laboratories[1,2]

Parameter	Vehicle			Linuron (50 mg/kg/day)					Linear Trend[5]
	N	LS Mean (SE)	CV (%)	N	LS Mean(SE)	CV (%)	Diff from Vehicle[3]	Ratio to Vehicle (%)[4]	
Testosterone (ng/ml)	15	6.137 (0.950)	59.9	15	6.317 (1.267)	77.7	0.180 (1.584)	102.929 (26.081)	-1.386 (1.158)
LH (ng/ml)	15	0.693 (0.098)	54.8	15	0.880 (0.098)	43.2	0.187 (0.139)	126.923 (22.858)	-0.091 (0.100)
TSH (ng/ml)	15	15.393 (1.697)	42.7	15	13.947 (1.357)	37.7	-1.447 (2.173)	90.602 (13.321)	-3.069 (1.539)
T4 (µg/dl)	15	4.973 (0.217)	16.9	15	2.687 (0.229)	33.1	-2.287 (0.316)**	54.021 (5.181)	-3.299 (0.167)**
T3 (ng/dl)	15	79.993 (2.859)	13.8	15	78.627 (2.859)	14.1	-1.367 (4.044)	98.292 (5.012)	-10.712 (2.905)**
FSH (ng/ml)	15	13.133 (0.589)	17.4	15	15.733 (0.474)	11.7	2.600 (0.756)**	119.797 (6.468)	1.574 (0.689)*
Estradiol (pg/ml)	15	38.353 (12.954)	130.8	13	44.123 (13.915)	113.7	5.770 (19.011)	115.044 (53.161)	12.400 (13.443)
Prolactin (ng/ml)	11	2.936 (0.448)	50.7	13	3.115 (0.763)	88.4	0.179 (0.885)	106.097 (30.636)	-1.136 (0.730)
DHT (pg/ml)	15	225.607 (39.650)	68.1	15	161.047 (43.782)	105.3	-64.560 (59.068)	71.384 (23.108)	-25.521 (42.701)

1. Least squares means and standard errors were estimated based on a one-way ANOVA model applied to all data for each parameter.
2. CV was calculated as residual standard deviation/LS Mean.
3. Significant differences from the vehicle were indicated by "*" for the 0.05 level and "**" for the 0.05/8 level (a Bonferroni adjusted p-level).
4. Ratio to the vehicle was calculated as percent of vehicle group mean. The standard error for the ratio Y/X was $Se[R(X, Y)] \approx |1/X| [(Y/X)^2 S_X^2 + S_Y^2]^{1/2} \times 100\%$
5. Linear Contrast $\equiv [-3X_0 - X_1 + X_2 + 3X_3]/[20]^{1/2}$, where X_0 is vehicle, X_1, X_2, and X_3 are the low, mid, and high dosage levels of Linuron respectively. Significant dose trend was indicated by "*" for the 0.05 level and "**" for the 0.05/8 level.

Table 6 (cont.). Summary Statistics between Vehicle and Linuron in Adult Intact Male Assay for Hormonal Parameters for WIL Laboratories[1,2]

Parameter	Vehicle			Linuron (100 mg/kg/day)					
	N	LS Mean (SE)	CV (%)	N	LS Mean(SE)	CV (%)	Diff from Vehicle[3]	Ratio to Vehicle (%)[4]	Linear Trend[5]
Testosterone (ng/ml)	15	6.137 (0.950)	59.9	15	6.225 (1.267)	78.9	0.088 (1.584)	101.432 (25.940)	-1.386 (1.158)
LH (ng/ml)	15	0.693 (0.098)	54.8	15	0.667 (0.098)	57.0	-0.027 (0.139)	96.154 (19.625)	-0.091 (0.100)
TSH (ng/ml)	15	15.393 (1.697)	42.7	15	12.247 (1.357)	42.9	-3.147 (2.173)	79.558 (12.435)	-3.069 (1.539)
T4 (µg/dl)	15	4.973 (0.217)	16.9	15	1.287 (0.205)	61.6	-3.687 (0.298)**	25.871 (4.267)	-3.299 (0.167)**
T3 (ng/dl)	15	79.993 (2.859)	13.8	15	69.873 (2.859)	15.8	-10.120 (4.044)*	87.349 (4.746)	-10.712 (2.905)**
FSH (ng/ml)	15	13.133 (0.589)	17.4	15	16.573 (1.088)	25.4	3.440 (1.237)*	126.193 (10.029)	1.574 (0.689)*
Estradiol (pg/ml)	15	38.353 (12.954)	130.8	15	57.000 (12.954)	88.0	18.647 (18.320)	148.618 (60.501)	12.400 (13.443)
Prolactin (ng/ml)	11	2.936 (0.448)	50.7	11	2.009 (0.830)	137.0	-0.927 (0.943)	68.421 (30.135)	-1.136 (0.730)
DHT (pg/ml)	15	225.607 (39.650)	68.1	15	211.440 (43.782)	80.2	-14.167 (59.068)	93.721 (25.454)	-25.521 (42.701)

1. Least squares means and standard errors were estimated based on a one-way ANOVA model applied to all data for each parameter.
2. CV was calculated as residual standard deviation/LS Mean.
3. Significant differences from the vehicle were indicated by "*" for the 0.05 level and "**" for the 0.05/8 level (a Bonferroni adjusted p-level).
4. Ratio to the vehicle was calculated as percent of vehicle group mean. The standard error for the ratio Y/X was $Se[R(X, Y)] \approx |1/X| [(Y/X)^2 S_X^2 + S_Y^2]^{1/2} \times 100\%$
5. Linear Contrast $\equiv [-3X_0 - X_1 + X_2 + 3X_3]/[20]^{1/2}$, where X_0 is vehicle, X_1, X_2, and X_3 are the low, mid, and high dosage levels of Linuron respectively. Significant dose trend was indicated by "*" for the 0.05 level and "**" for the 0.05/8 level.

Table 6 (cont.). Summary Statistics between Vehicle and Linuron in Adult Intact Male Assay for Hormonal Parameters for WIL Laboratories[1,2]

Parameter	Vehicle			Linuron (150 mg/kg/day)					Linear Trend[5]
	N	LS Mean (SE)	CV (%)	N	LS Mean(SE)	CV (%)	Diff from Vehicle[3]	Ratio to Vehicle (%)[4]	
Testosterone (ng/ml)	15	6.137 (0.950)	59.9	14	4.102 (1.312)	119.6	-2.035 (1.620)	66.845 (23.747)	-1.386 (1.158)
LH (ng/ml)	15	0.693 (0.098)	54.8	14	0.629 (0.102)	60.4	-0.065 (0.141)	90.659 (19.465)	-0.091 (0.100)
TSH (ng/ml)	15	15.393 (1.697)	42.7	14	11.386 (1.405)	46.2	-4.008 (2.203)	73.965 (12.237)	-3.069 (1.539)
T4 (µg/dl)	15	4.973 (0.217)	16.9	14	0.521 (0.064)	45.9	-4.452 (0.226)**	10.484 (1.364)	-3.299 (0.167)**
T3 (ng/dl)	15	79.993 (2.859)	13.8	14	66.943 (2.960)	16.5	-13.050 (4.116)**	83.686 (4.758)	-10.712 (2.905)**
FSH (ng/ml)	15	13.133 (0.589)	17.4	14	15.200 (0.743)	18.3	2.067 (0.948)*	115.736 (7.675)	1.574 (0.689)*
Estradiol (pg/ml)	15	38.353 (12.954)	130.8	13	52.546 (13.915)	95.5	14.193 (19.011)	137.005 (58.801)	12.400 (13.443)
Prolactin (ng/ml)	11	2.936 (0.448)	50.7	9	1.611 (0.918)	170.9	-1.325 (1.021)	54.868 (32.352)	-1.136 (0.730)
DHT (pg/ml)	15	225.607 (39.650)	68.1	14	170.764 (45.319)	99.3	-54.842 (60.216)	75.691 (24.093)	-25.521 (42.701)

1. Least squares means and standard errors were estimated based on a one-way ANOVA model applied to all data for each parameter.
2. CV was calculated as residual standard deviation/LS Mean.
3. Significant differences from the vehicle were indicated by "*" for the 0.05 level and "**" for the 0.05/8 level (a Bonferroni adjusted p-level).
4. Ratio to the vehicle was calculated as percent of vehicle group mean. The standard error for the ratio Y/X was $Se[R(X, Y)] \approx |1/X| [(Y/X)^2 S_X^2 + S_Y^2]^{1/2} \times 100\%$
5. Linear Contrast $\equiv [-3X_0 - X_1 + X_2 + 3X_3]/[20]^{1/2}$, where X_0 is vehicle, X_1, X_2, and X_3 are the low, mid, and high dosage levels of Linuron respectively. Significant dose trend was indicated by "*" for the 0.05 level and "**" for the 0.05/8 level.

Table 7. Summary Statistics between Vehicle and Phenobarbital in Adult Intact Male Assay for Hormonal Parameters for WIL Laboratories[1,2]

Parameter	Vehicle			Phenobarbital (25 mg/kg/day)					Linear Trend[5]
	N	LS Mean (SE)	CV (%)	N	LS Mean(SE)	CV (%)	Diff from Vehicle[3]	Ratio to Vehicle (%)[4]	
Testosterone (ng/ml)	15	6.137 (0.950)	59.9	15	4.475 (0.674)	58.3	-1.663 (1.165)	72.911 (15.747)	-2.409 (0.819)**
LH (ng/ml)	15	0.693 (0.098)	54.8	15	0.647 (0.098)	58.7	-0.047 (0.139)	93.269 (19.344)	0.038 (0.100)
TSH (ng/ml)	15	15.393 (1.697)	42.7	15	24.013 (2.816)	45.4	8.620 (3.288)*	155.998 (25.109)	11.451 (2.432)**
T4 (µg/dl)	15	4.973 (0.217)	16.9	15	4.133 (0.293)	27.4	-0.840 (0.365)*	83.110 (6.916)	-2.468 (0.213)**
T3 (ng/dl)	15	79.993 (2.859)	13.8	15	72.040 (2.859)	15.4	-7.953 (4.044)	90.058 (4.811)	-17.439 (2.905)**
FSH (ng/ml)	15	13.133 (0.589)	17.4	15	11.033 (0.447)	15.7	-2.100 (0.739)*	84.010 (5.073)	-0.903 (0.595)
Estradiol (pg/ml)	15	38.353 (12.954)	130.8	15	41.553 (12.954)	120.7	3.200 (18.320)	108.343 (49.798)	36.006 (13.183)*
Prolactin (ng/ml)	11	2.936 (0.448)	50.7	11	2.291 (0.619)	89.6	-0.645 (0.764)	78.019 (24.203)	-0.456 (0.582)
DHT (pg/ml)	15	225.607 (39.650)	68.1	15	141.627 (23.713)	64.8	-83.980 (46.200)	62.776 (15.238)	-87.821 (32.168)*

1. Least squares means and standard errors were estimated based on a one-way ANOVA model applied to all data for each parameter.
2. CV was calculated as residual standard deviation/LS Mean.
3. Significant differences from the vehicle were indicated by "*" for the 0.05 level and "**" for the 0.05/8 level (a Bonferroni adjusted p-level).
4. Ratio to the vehicle was calculated as percent of vehicle group mean. The standard error for the ratio Y/X was $Se[R(X, Y)] \approx |1/X| [(Y/X)^2 S_X^2 + S_Y^2]^{1/2} \times 100\%$
5. Linear Contrast $\equiv [-3X_0 - X_1 + X_2 + 3X_3]/[20]^{1/2}$, where X_0 is vehicle, X_1, X_2, and X_3 are the low, mid, and high dosage levels of phenobarbital respectively. Significant dose trend was indicated by "*" for the 0.05 level and "**" for the 0.05/8 level.

Table 7 (cont.). Summary Statistics between Vehicle and Phenobarbital in Adult Intact Male Assay for Hormonal Parameters for WIL Laboratories[1,2]

Parameter	Vehicle			Phenobarbital (50 mg/kg/day)					Linear Trend[5]
	N	LS Mean (SE)	CV (%)	N	LS Mean(SE)	CV (%)	Diff from Vehicle[3]	Ratio to Vehicle (%)[4]	
Testosterone (ng/ml)	15	6.137 (0.950)	59.9	15	3.501 (0.674)	74.6	-2.636 (1.165)*	57.053 (14.092)	-2.409 (0.819)**
LH (ng/ml)	15	0.693 (0.098)	54.8	15	0.560 (0.098)	67.8	-0.133 (0.139)	80.769 (18.184)	0.038 (0.100)
TSH (ng/ml)	15	15.393 (1.697)	42.7	15	25.833 (2.816)	42.2	10.440 (3.288)**	167.822 (26.019)	11.451 (2.432)**
T4 (µg/dl)	15	4.973 (0.217)	16.9	15	2.893 (0.148)	19.8	-2.080 (0.263)**	58.177 (3.909)	-2.468 (0.213)**
T3 (ng/dl)	15	79.993 (2.859)	13.8	15	62.773 (2.859)	17.6	-17.220 (4.044)**	78.473 (4.544)	-17.439 (2.905)**
FSH (ng/ml)	15	13.133 (0.589)	17.4	15	11.187 (0.674)	23.3	-1.947 (0.895)*	85.178 (6.396)	-0.903 (0.595)
Estradiol (pg/ml)	15	38.353 (12.954)	130.8	14	48.836 (13.409)	102.7	10.482 (18.644)	127.331 (55.424)	36.006 (13.183)*
Prolactin (ng/ml)	11	2.936 (0.448)	50.7	11	2.427 (0.619)	84.5	-0.509 (0.764)	82.663 (24.560)	-0.456 (0.582)
DHT (pg/ml)	15	225.607 (39.650)	68.1	15	126.987 (23.713)	72.3	-98.620 (46.200)*	56.287 (14.434)	-87.821 (32.168)*

1. Least squares means and standard errors were estimated based on a one-way ANOVA model applied to all data for each parameter.
2. CV was calculated as residual standard deviation/LS Mean.
3. Significant differences from the vehicle were indicated by "*" for the 0.05 level and "**" for the 0.05/8 level (a Bonferroni adjusted p-level).
4. Ratio to the vehicle was calculated as percent of vehicle group mean. The standard error for the ratio Y/X was $Se[R(X, Y)] \approx |1/X| [(Y/X)^2 S_X^2 + S_Y^2]^{1/2} \times 100\%$
5. Linear Contrast $\equiv [-3X_0 - X_1 + X_2 + 3X_3]/[20]^{1/2}$, where X_0 is vehicle, X_1, X_2, and X_3 are the low, mid, and high dosage levels of phenobarbital respectively. Significant dose trend was indicated by "*" for the 0.05 level and "**" for the 0.05/8 level.

Table 7 (cont.). Summary Statistics between Vehicle and Phenobarbital in Adult Intact Male Assay for Hormonal Parameters for WIL Laboratories[1,2]

Parameter	Vehicle			Phenobarbital (100 mg/kg/day)					Linear Trend[5]
	N	LS Mean (SE)	CV (%)	N	LS Mean(SE)	CV (%)	Diff from Vehicle[3]	Ratio to Vehicle (%)[4]	
Testosterone (ng/ml)	15	6.137 (0.950)	59.9	14	2.870 (0.698)	91.0	-3.267 (1.179)*	46.763 (13.477)	-2.409 (0.819)**
LH (ng/ml)	15	0.693 (0.098)	54.8	14	0.779 (0.102)	48.8	0.085 (0.141)	112.294 (21.604)	0.038 (0.100)
TSH (ng/ml)	15	15.393 (1.697)	42.7	14	31.857 (2.915)	34.2	16.464 (3.373)**	206.954 (29.649)	11.451 (2.432)**
T4 (µg/dl)	15	4.973 (0.217)	16.9	14	1.707 (0.204)	44.6	-3.266 (0.298)**	34.326 (4.360)	-2.468 (0.213)**
T3 (ng/dl)	15	79.993 (2.859)	13.8	14	57.086 (2.960)	19.4	-22.908 (4.116)**	71.363 (4.494)	-17.439 (2.905)**
FSH (ng/ml)	15	13.133 (0.589)	17.4	14	11.736 (0.607)	19.4	-1.398 (0.846)	89.358 (6.116)	-0.903 (0.595)
Estradiol (pg/ml)	15	38.353 (12.954)	130.8	14	89.600 (13.409)	56.0	51.247 (18.644)*	233.617 (86.303)	36.006 (13.183)*
Prolactin (ng/ml)	11	2.936 (0.448)	50.7	9	2.211 (0.684)	92.8	-0.725 (0.818)	75.301 (25.975)	-0.456 (0.582)
DHT (pg/ml)	15	225.607 (39.650)	68.1	14	99.571 (24.545)	92.2	-126.036 (46.633)*	44.135 (13.362)	-87.821 (32.168)*

1. Least squares means and standard errors were estimated based on a one-way ANOVA model applied to all data for each parameter.
2. CV was calculated as residual standard deviation/LS Mean.
3. Significant differences from the vehicle were indicated by "*" for the 0.05 level and "**" for the 0.05/8 level (a Bonferroni adjusted p-level).
4. Ratio to the vehicle was calculated as percent of vehicle group mean. The standard error for the ratio Y/X was $Se[R(X, Y)] \approx |1/X| [(Y/X)^2 S_X^2 + S_Y^2]^{1/2} \times 100\%$
5. Linear Contrast $\equiv [-3X_0 - X_1 + X_2 + 3X_3]/[20]^{1/2}$, where X_0 is vehicle, X_1, X_2, and X_3 are the low, mid, and high dosage levels of phenobarbital respectively. Significant dose trend was indicated by "*" for the 0.05 level and "**" for the 0.05/8 level.

Table 8. Summary Statistics between Vehicle and Linuron in Adult Intact Male Assay for Hormonal Parameters for WIL Laboratories[1,2]. Outliers Excluded.

Parameter	Vehicle			Linuron (50 mg/kg/day)					Linear Trend[5]
	N	LS Mean (SE)	CV (%)	N	LS Mean(SE)	CV (%)	Diff from Vehicle[3]	Ratio to Vehicle (%)[4]	
Estradiol (pg/ml)	14	33.529 (3.414)	38.1004	13	44.123 (3.543)	28.9520	10.595 (4.920)*	131.598 (17.066)	8.409 (3.546)*
Prolactin (ng/ml)	11	2.936 (0.448)	50.6566	12	2.017 (0.335)	57.5002	-0.920 (0.560)	68.679 (15.492)	-0.891 (0.412)*

1. Least squares means and standard errors were estimated based on a one-way ANOVA model applied to the hormonal data for each parameter. Outlier excluded.
2. CV was calculated as residual standard deviation/LS Mean.
3. Significant differences from the vehicle were indicated by "*" for the 0.05 level and "**" for the 0.05/8 level (a Bonferroni adjusted p-level).
4. Ratio to the vehicle was calculated as percent of vehicle group mean. The standard error for the ratio Y/X was $Se[R(X, Y)] \approx |1/X| [(Y/X)^2 S_X^2 + S_Y^2]^{½} \times 100\%$.
5. Linear Contrast $\equiv [-3X_0 - X_1 + X_2 + 3X_3]/[20]^{½,}$ where X_0 is vehicle, X_1, X_2, and X_3 are the low, mid, and high dosage levels of Linuron respectively. Significant dose trend was indicated by "*" for the 0.05 level and "**" for the 0.05/8 level.

Table 8 (cont.). Summary Statistics between Vehicle and Linuron in Adult Intact Male Assay for Hormonal Parameters for WIL Laboratories[1,2]. Outliers Excluded.

Parameter	Vehicle			Linuron (100 mg/kg/day)					Linear Trend[5]
	N	LS Mean (SE)	CV (%)	N	LS Mean(SE)	CV (%)	Diff from Vehicle[3]	Ratio to Vehicle (%)[4]	
Estradiol (pg/ml)	14	33.529 (3.414)	38.1004	14	47.064 (3.414)	27.1427	13.536 (4.828)**	140.371 (17.550)	8.409 (3.546)*
Prolactin (ng/ml)	11	2.936 (0.448)	50.6566	11	2.009 (0.350)	57.7170	-0.927 (0.569)	68.421 (15.842)	-0.891 (0.412)*

1. Least squares means and standard errors were estimated based on a one-way ANOVA model applied to the hormonal data for each parameter. Outlier excluded.
2. CV was calculated as residual standard deviation/LS Mean.
3. Significant differences from the vehicle were indicated by "*" for the 0.05 level and "**" for the 0.05/8 level (a Bonferroni adjusted p-level).
4. Ratio to the vehicle was calculated as percent of vehicle group mean. The standard error for the ratio Y/X was $Se[R(X, Y)] \approx |1/X| [(Y/X)^2 S_X^2 + S_Y^2]^{½} \times 100\%$.
5. Linear Contrast $\equiv [-3X_0 - X_1 + X_2 + 3X_3]/[20]^{½,}$ where X_0 is vehicle, X_1, X_2, and X_3 are the low, mid, and high dosage levels of Linuron respectively. Significant dose trend was indicated by "*" for the 0.05 level and "**" for the 0.05/8 level.

Table 8 (cont.). Summary Statistics between Vehicle and Linuron in Adult Intact Male Assay for Hormonal Parameters for WIL Laboratories[1,2]. Outliers Excluded.

Parameter	Vehicle			Linuron (150 mg/kg/day)					Linear Trend[5]
	N	LS Mean (SE)	CV (%)	N	LS Mean(SE)	CV (%)	Diff from Vehicle[3]	Ratio to Vehicle (%)[4]	
Estradiol (pg/ml)	14	33.529 (3.414)	38.1004	12	45.083 (3.688)	28.3353	11.555 (5.025)*	134.462 (17.562)	8.409 (3.546)*
Prolactin (ng/ml)	11	2.936 (0.448)	50.6566	9	1.611 (0.387)	71.9744	-1.325 (0.592)*	54.868 (15.605)	-0.891 (0.412)*

1. Least squares means and standard errors were estimated based on a one-way ANOVA model applied to the hormonal data for each parameter. Outlier excluded.
2. CV was calculated as residual standard deviation/LS Mean.
3. Significant differences from the vehicle were indicated by "*" for the 0.05 level and "**" for the 0.05/8 level (a Bonferroni adjusted p-level).
4. Ratio to the vehicle was calculated as percent of vehicle group mean. The standard error for the ratio Y/X was $Se[R(X, Y)] \approx |1/X| [(Y/X)^2 S_X^2 + S_Y^2]^{½} \times 100\%$.
5. Linear Contrast $\equiv [-3X_0 - X_1 + X_2 + 3X_3]/[20]^{½,}$ where X_0 is vehicle, X_1, X_2, and X_3 are the low, mid, and high dosage levels of Linuron respectively. Significant dose trend was indicated by "*" for the 0.05 level and "**" for the 0.05/8 level.

Table 9. Summary Statistics between Vehicle and Phenobarbital in Adult Intact Male Assay for Hormonal Parameters for WIL Laboratories[1,2]. Outliers Excluded.

Parameter	Vehicle			Phenobarbital (25 mg/kg/day)					Linear Trend[5]
	N	LS Mean (SE)	CV (%)	N	LS Mean(SE)	CV (%)	Diff from Vehicle[3]	Ratio to Vehicle (%)[4]	
Estradiol (pg/ml)	14	33.529 (3.414)	38.1004	15	41.553 (3.298)	30.7425	8.025 (4.747)	123.934 (16.001)	17.071 (3.474)**
Prolactin (ng/ml)	11	2.936 (0.448)	50.6566	11	2.291 (0.619)	89.5563	-0.645 (0.764)	78.019 (24.203)	-0.456 (0.582)

1. Least squares means and standard errors were estimated based on a one-way ANOVA model applied to the hormonal data for each parameter. Outlier excluded.
2. CV was calculated as residual standard deviation/LS Mean.
3. Significant differences from the vehicle were indicated by "*" for the 0.05 level and "**" for the 0.05/8 level (a Bonferroni adjusted p-level).
4. Ratio to the vehicle was calculated as percent of vehicle group mean. The standard error for the ratio Y/X was $Se[R(X, Y)] \approx |1/X| [(Y/X)^2 S_X^2 + S_Y^2]^{½} \times 100\%$.
5. Linear Contrast $\equiv [-3X_0 - X_1 + X_2 + 3X_3]/[20]^{½,}$ where X_0 is vehicle, X_1, X_2, and X_3 are the low, mid, and high dosage levels of phenobarbital respectively. Significant dose trend was indicated by "*" for the 0.05 level and "**" for the 0.05/8 level.

Table 9 (cont.). Summary Statistics between Vehicle and Phenobarbital in Adult Intact Male Assay for Hormonal Parameters for WIL Laboratories[1,2]. Outliers Excluded.

Parameter	Vehicle			Phenobarbital (50 mg/kg/day)					Linear Trend[5]
	N	LS Mean (SE)	CV (%)	N	LS Mean(SE)	CV (%)	Diff from Vehicle[3]	Ratio to Vehicle (%)[4]	
Estradiol (pg/ml)	14	33.529 (3.414)	38.1004	13	43.446 (3.543)	29.4031	9.918 (4.920)*	129.579 (16.905)	17.071 (3.474)**
Prolactin (ng/ml)	11	2.936 (0.448)	50.6566	11	2.427 (0.619)	84.5250	-0.509 (0.764)	82.663 (24.560)	-0.456 (0.582)

1. Least squares means and standard errors were estimated based on a one-way ANOVA model applied to the hormonal data for each parameter. Outlier excluded.
2. CV was calculated as residual standard deviation/LS Mean.
3. Significant differences from the vehicle were indicated by "*" for the 0.05 level and "**" for the 0.05/8 level (a Bonferroni adjusted p-level).
4. Ratio to the vehicle was calculated as percent of vehicle group mean. The standard error for the ratio Y/X was $Se[R(X, Y)] \approx |1/X| [(Y/X)^2 S_X^2 + S_Y^2]^{½} \times 100\%$.
5. Linear Contrast $\equiv [-3X_0 - X_1 + X_2 + 3X_3]/[20]^{½,}$ where X_0 is vehicle, X_1, X_2, and X_3 are the low, mid, and high dosage levels of phenobarbital respectively. Significant dose trend was indicated by "*" for the 0.05 level and "**" for the 0.05/8 level.

Table 9 (cont.). Summary Statistics between Vehicle and Phenobarbital in Adult Intact Male Assay for Hormonal Parameters for WIL Laboratories[1,2]. Outliers Excluded.

Parameter	Vehicle			Phenobarbital (100 mg/kg/day)					Linear Trend[5]
	N	LS Mean (SE)	CV (%)	N	LS Mean(SE)	CV (%)	Diff from Vehicle[3]	Ratio to Vehicle (%)[4]	
Estradiol (pg/ml)	14	33.529 (3.414)	38.1004	13	58.346 (3.543)	21.8944	24.818 (4.920)**	174.019 (20.632)	17.071 (3.474)**
Prolactin (ng/ml)	11	2.936 (0.448)	50.6566	9	2.211 (0.684)	92.7883	-0.725 (0.818)	75.301 (25.975)	-0.456 (0.582)

1. Least squares means and standard errors were estimated based on a one-way ANOVA model applied to the hormonal data for each parameter. Outlier excluded.
2. CV was calculated as residual standard deviation/LS Mean.
3. Significant differences from the vehicle were indicated by "*" for the 0.05 level and "**" for the 0.05/8 level (a Bonferroni adjusted p-level).
4. Ratio to the vehicle was calculated as percent of vehicle group mean. The standard error for the ratio Y/X was $Se[R(X, Y)] \approx |1/X| [(Y/X)^2 S_X^2 + S_Y^2]^{½} \times 100\%$.
5. Linear Contrast $\equiv [-3X_0 - X_1 + X_2 + 3X_3]/[20]^{½,}$ where X_0 is vehicle, X_1, X_2, and X_3 are the low, mid, and high dosage levels of phenobarbital respectively. Significant dose trend was indicated by "*" for the 0.05 level and "**" for the 0.05/8 level.

APPENDIX A

Certificates Of Analysis (Manufacturer-Provided Data)

SIGMA-ALDRICH

Certificate of Analysis

Product Name	Phenobarbital,
Product Number	P1636
Product Brand	Sigma
CAS Number	50-06-6
Molecular Formula	$C_{12}H_{12}N_2O_3$
Molecular Weight	232.24

TEST	SPECIFICATION	LOT 104K2600 RESULTS
APPEARANCE	WHITE POWDER	WHITE POWDER
SOLUBILITY	CLEAR COLORLESS SOLUTION AT 50MG/ML IN ETHANOL	CLEAR COLORLESS SOLUTION
IR SPECTRUM	CONSISTENT WITH STRUCTURE	CONFORMS
PURITY BY NAOH TITRATION	NLT 99%	99.1%
PURITY BY THIN LAYER CHROMATOGRAPHY	NLT 99%	GREATER THAN 99%
SHELF LIFE	5 YEARS	FEBRUARY 2010
QC ACCEPTANCE DATE		FEBRUARY 2005

Lori Schulz

Lori Schulz, Manager
Analytical Services
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CERTIFICATE OF ANALYSIS

INVOICE #: CS264916
PO #: 19293

CATALOG #: PS-372 CAS #: 330-55-2

DESCRIPTION: Linuron

LOT #: 348-8A

PURITY: 99.5%

EXPIRATION DATE: 08/08

Chem Service, Inc. guarantees the purity of this chemical ± 0.5% deviation prior to the expiration date shown on the label and exclusive of any customer contamination.

Two or more of the following methods of analysis are used to determine purity: Melting point, refractive index, titration, IR, TLC, GC/FID, GC/TCD, GC/ECD, GC/MS, HPLC or DSC.

Our standards are suitable for use with all EPA methods.

Certified By:

John Conrad

John Conrad
CSM/TC

ISO 9001
Certificate Number 31610

APPENDIX B

Analyses Of Test Substances (Battelle Memorial Institute)

1.0 TITLE PAGE

Study Title: Analysis of Test Substances for Work Assignment 5-15

Authors: Tim Fortman, Michael Cobb

Study Initiation Date: 8/26/05

Study Completion Date: January 12, 2006

Performing Lab: EDSP Chemical Repository,
Battelle Marine Sciences Laboratory,
1529 West Sequim Bay Road,
Sequim, WA 98382

Study Number: EDSP.515-01

Data Requirement: 40 CFR Part 160.105, 160.113

Submitted To: Dr. David P. Houchens,
EDSP Program Manager
Battelle Columbus Operations,
505 King Avenue,
Columbus, OH, 43201-2693

Total Number of Pages: 52

2.0 STATEMENT OF NO DATA CONFIDENTIALITY CLAIMS

No claim of confidentially is made for any information contained in this study on the basis of its falling within the scope of the United States Environmental Protection Agency Federal Insecticide, Fungicide, and Rodenticide Act Section 10(d) (1)(A), (B), or (C).

Company: Battelle

Company Agent: David P. Houchens, Ph.D.

Title: EDSP Program Manager

Signature: David P. Houchens Date: 1/12/06

3.0 STATEMENT OF COMPLIANCE

This study meets the requirements for 40 CFR Part 160, EPA FIFRA Good Laboratory Practices:

Note: Protocol, and any amendments and deviations are provided in Appendix B of this report. Method deviations are described in Appendix F of this report.

Study Director: _____ 1/12/06
Michael Cobb — Date
Battelle – Marine Sciences Laboratory

Sponsor's Representative: _____ 1/6/06
David Houchens, Ph.D. — Date
Battelle Columbus Operations

Submitter: _____ 1/12/06
Date

4.0 QUALITY ASSURANCE

This study was examined for compliance with Good Laboratory Practice Standards as published by the U.S. Environmental Protection Agency, Office of Pesticide Programs in 40 CFR Part 160, 17 August 1989. The dates of all audits and inspections and the dates of any findings were reported to the Study Director and Test Facility Management as follows:

ACTIVITY	DATE CONDUCTED	DATE REPORTED TO:	
		STUDY DIRECTOR	MANAGEMENT
Technical Systems Audit, Analysis of Day 7 Phenobarbital Samples	September 22, 2005	September 22, 2005	September 22, 2005
Audit of Data Quality, Stability/Purity Data and Draft Report	December 30, 2005 January 9, 2006	January 9, 2006	January 9, 2006
Final Report	January 12, 2006	January 12, 2006	January 12, 2006

Mary E. Lynn
Quality Assurance

1/12/06
Date

5.0 APPROVALS PAGE

Study Title: Analysis of Test Substances for Work Assignment 5-15

Submitted by: Battelle Marine Sciences Laboratory
Address: 1529 West Sequim Bay Road
Sequim, WA 98382

Prepared by:
Eric Crecelius for Fortman 1-12-06
Timothy Fortman Date
Senior Chemistry Analyst
Battelle – Marine Sciences Laboratory

Approved by:
1-12-06
Michael E. Cobb Date
EDSP Chemical Repository Study Director
Battelle – Marine Sciences Laboratory

Approved by:
Eric Crecelius 1-12-06
Eric Crecelius Date
Manager, EDSP Chemical Repository
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Personnel participating in this study:

Analysts: Linda Bingler, Timothy Fortman

Chemical Repository Study Director: Michael Cobb

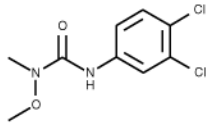
Experimental Start: September 14, 2005

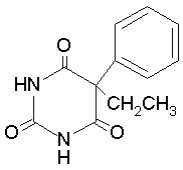
Experimental Termination: October 6, 2005

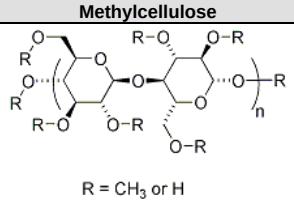
6.0 EXECUTIVE SUMMARY

Analysis of Test Substances for Work Assignment 5-15

Table 1. Study Test and Reference Substances and Vehicle

Parameter	Test & Reference Substance	Linuron
Compound Name	Linuron	
CAS #	330-55-2	
Central File No.	2463-1	
Initial Receipt Date	08/24/2005	
Expiration Date	August 2008	
Supplier	Chem Service	
Lot Number	348-8A	
Method	EDSP.H4-033	

Parameter	Test & Reference Substance	Phenobarbital
Compound Name	Phenobarbital	
CAS #	50-06-6	
Central File No.	2461-1	
Initial Receipt Date	08/16/2005	
Expiration Date	February 2010	
Manufacturer	Sigma	
Lot Number	104K2600	
Method	EDSP.H4-034	

Parameter	Test Substance	Methylcellulose
Compound Name	Methylcellulose	
CAS #	9004-67-5	
Central File No.	2462-1	
Initial Receipt Date	08/24/05	
Expiration Date	August 2010	
Supplier	Sigma	
Lot Number	14601TC	
Method	N/A*	

*Not applicable

Executive Summary

Work Assignment (WA) 5-15 of the Environmental Protection Agency's (EPA) Endocrine Disruptor Screening Program (EDSP) describes an *Inter-laboratory Validation of the 15-Day Intact Adult Male Rat Assay*. The Chemical Repository (CR) has the responsibility for carrying out the purity, formulation preparation, method development, method validation, and formulation stability determinations of selected study test substances for EDSP studies. The chemistry formulation (in a methylcellulose carrier), purity determination, and stability studies for the test substance phenobarbital, and the formulation, homogeneity, and purity of the test substance linuron (also formulated in methylcellulose) are documented in the present report.

The EPA limited the study for linuron to determination of homogeneity and purity (stability was done during WA 2-28). The test substance purities as determined by the supplier and confirmed by the CR are provided in Table 2.

Table 2. Test and Reference Substance Purity

TEST SUBSTANCE	REPORTED PURITY	LOT NUMBER	CR DETERMINED PURITY[1]
Linuron	99.5%	348-8A	97.69%
Phenobarbital	99.1%	104K2600	99.98%

The formulation preparation procedures developed for the test substance linuron produced a suspension with actual concentrations measured in the top 1/3 and the bottom 1/3 of the container that were within 10 percent of the target concentrations for linuron per specifications. Determinations for both levels were carried out in triplicate. The protocol specified that recoveries at the two levels would agree within 10%. The linuron values met this specification. The phenobarbital formulation yielded concentrations that were within the formulation accuracy specification but fell out of the 10% agreement (homogeneity) specification (for the 5 mg/mL day 1 determination and the 20 mg/mL day 7 determination). The formulation concentrations that were analyzed for both test substances are summarized in Tables 3 and 4.

Table 3. Formulation Homogeneity - Linuron

Test Substance	Position of Measurement	Recovery	Agreement
Linuron	Top 1/3	90.58%	3.16%
	Bottom 1/3	93.49%	

Table 4. Formulation Homogeneity – Phenobarbital 5 mg/mL

Test Substance	Position of Measurement	Recovery (day 1)	Agreement (day 1)	Recovery (day 7)	Agreement (day 7)	Recovery (day 14)	Agreement (day 14)
Phenobarbital 5 mg/mL	Top 1/3	91.32%	13.17%	96.96%	2.84%	97.32%	0.59%
	Bottom 1/3	104.19%		99.75%		96.75%	

Table 5. Formulation Homogeneity – Phenobarbital 20 mg/mL

Test Substance	Position of Measurement	Recovery (day 0)	Agreement (day 0)	Recovery (day 7)	Agreement (day 7)	Recovery (day 14)	Agreement (day 14)
Phenobarbital 20 mg/mL	Top 1/3	96.90%	0.63%	91.97%	10.95%	97.13%	0.93%
	Bottom 1/3	97.51%		102.62%		98.04%	

As determined in WA 2-28, linuron (at 5 mg/mL in 0.25% methylcellulose): demonstrated stability performance at ≥ 90% of the target concentration for the testing period of 21 days. The stability evaluation for the phenobarbital formulations was specified as a 28 day study with sample analyses to be carried out on days 0, 7, 14, 21, and 28. Due to poor performance of the day zero 5 mg/mL phenobarbital result, the day zero determination was repeated the following day resulting in test intervals[2] for the 5 mg/mL suspension of 1, 7, 14, and 21. Results at day 14 (Table 4) indicated the 5 mg/mL suspension of phenobarbital was still within ±10% of the nominal concentration, but by day 21 had fallen to a 68% recovery. Recovery for the 20 mg/mL suspension of phenobarbital at day 14 (Table 5) was still within ±10% of the nominal concentration, but by day 21 had fallen to 71%. The study for the two suspensions was stopped after day 21.

[1]Calculations for purity are: area of compound of interest divided by the total area where the total area is adjusted by subtracting a blank area.

[2]A protocol deviation (EDSP.515-01-D1) was generated to document this change in stability test intervals for the 5 mg/mL phenobarbital suspension (see Appendix B).

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8.0 INTRODUCTION

The goal of the Battelle-Sequim, Marine Sciences Laboratory (MSL) Chemical Repository for the Endocrine Disruptor Screening Program (EDSP) is to provide the participating laboratory or laboratories with requested chemicals of documented quality and if required, at concentrations in a matrix appropriate for different toxicological tests. The EDSP Chemical Repository (CR) provides supplier information regarding purity, the material safety data sheet (MSDS) chemical information, and independent analysis of purity, formulation preparation, method development, method validation, and stability in a matrix specified by the Study Protocol: *Analysis of Test Substances for Work Assignment 5-15 [EDSP Study Number: EDSP.515-01]*, made in collaboration with the requesting Study Director. Under Work Assignment (WA) 5-15, the Environmental Protection Agency (EPA) contracted with the CR for purity characterization of the test substances (Table 6), linuron and phenobarbital. The CR was charged with carrying out method development and validation, formulation preparation (in a 0.25% methylcellulose carrier), homogeneity determination, and purity testing on both test substances. In addition, a 28 day stability study was scheduled for phenobarbital as formulated in the carrier at two concentrations. Both test substances were suspensions in the carrier at the study concentrations.

9.0 GENERAL METHODS

Methods of standard operation of the CR are currently addressed in MSL SOPs numbered R-001 through R-017. These procedures address chemical procurement including procurement of controlled substances, when applicable, which have unique permitting, ordering, handling, inventory, and storage requirements; chemical receipt and chain of custody, chemical log-in and labeling, inventory, chemical storage, stock solution preparation, documentation and archiving, test solution preparation, documentation and shipping, chemical disposal, and CR maintenance over time. The quality assurance (QA) requirements for procurement of chemicals for use in the CR are addressed in the Quality Assurance Project Plan (QAPP) for EDSP CR.

9.1 TEST SUBSTANCE PROCUREMENT

As requested by EPA linuron, (CAS No. 330-55-2), phenobarbital (CAS No. 50-06-6), and the carrier methylcellulose (CAS No. 9004-67-5), formulated in water at 0.25%, were purchased from two suppliers as outlined in Table 6. The two test substances were used for purity, method development, method validation (phenobarbital only), formulation preparation, and stability analysis (phenobarbital only), as specified in section 8.0 above, and shipped to the participating laboratories for use in the *Inter-laboratory Validation of the 15-Day Intact Adult Male Rat Assay*. The chemicals were logged into the Chemical Management System (CMS) and each given a unique CMS barcode and log-in (central file) number as per the QAPP for the EDSP CR. The chemicals were stored in the CR at conditions specified in the material safety data sheets and documented in test substance specific Chemical Acquisition Task Notebooks.

Table 6. Study Test and Reference Substances and Vehicle

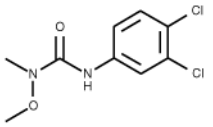
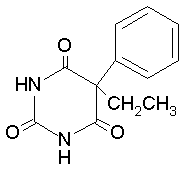
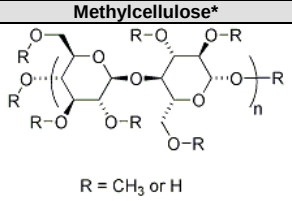
Parameter	Test Substance	Linuron
Compound Name	Linuron	
CAS #	330-55-2	
Central File No.	2463-1	
Initial Receipt Date	08/24/2005	
Expiration Date	August 2008	
Supplier	Chem Service	
Lot Number	348-8A	
Method	EDSP.H4-033	

Table 6. Study Test and Reference Substances (continued)

Parameter	Test Substance	Phenobarbital
Compound Name	Phenobarbital	
CAS #	50-06-6	
Central File No.	2461-1	
Initial Receipt Date	08/16/2005	
Expiration Date	February 2010	
Manufacturer	Sigma	
Lot Number	104K2600	
Method	EDSP.H4-034	

Parameter	Test Substance	Methylcellulose*
Compound Name	Methylcellulose	
CAS #	9004-67-5	
Central File No.	2462-1	
Initial Receipt Date	08/24/05	
Expiration Date	August 2010	
Supplier	Sigma	
Lot Number	14601TC	
Method	N/A	

* structure for sucrose shown, structure for a singe chain of methylcellulose will be similar

9.2 TEST SUBSTANCE PURITY

Test substance purity for linuron was determined using high performance liquid chromatography (HPLC) with ultraviolet/visible (UV/VIS) detection. Purity verification for this test substance was conducted by making a solution of about 5.0 µg/ml of the substance in 60% acetonitrile and 40% water. This matrix was then run on an HPLC with a UV/VIS diode array detector. A 60% acetonitrile and 40% water blank was also analyzed on the system. The purity was determined by comparing the area of the peak associated with the substance of interest with the total area of all the peaks in the chromatogram. The areas associated with peaks common to the blank were eliminated by subtraction. The percentage associated with the largest peak represented the purity of the test substance. This result was compared to the supplier's certificate of analysis/purity (Appendix A). The HPLC was optimized with a Phenomenex SYNERGI 4µ Hydro-RP 80A 250 X 4.6 mm 4µ HPLC column. Pressure limit on the column was 250 BAR. The system employs a UV/VIS diode array detector set to a collection wavelength of 250 nm. The run time was set to 12 minutes. A single replicate was analyzed for linuron.

Test substance purity for phenobarbital was determined using (HPLC) with UV/VIS detection. Purity verification for this test substance was conducted by making a solution of about 200 µg/mL of the substance in 50% acetonitrile and 50% water. This matrix was then run on an HPLC with a UV/VIS diode array detector. A 50% acetonitrile and 50% water blank was also analyzed on the system. The purity was determined by comparing the area of the peak associated with the substance of interest with the total area of all the peaks in the chromatogram. The areas associated with peaks common to the blank were eliminated by subtraction. The percentage associated with the largest peak represented the purity of the test substance. This result was compared to the supplier's certificate of analysis/purity (Appendix A). The HPLC was set up with a Phenomenex SYNERGI 4µ Hydro-RP 80A 250 X 4.6 mm 4µ HPLC column. Pressure limit on the column was 3000 PSI. The detector is a diode array detector set to a collection wavelength of 225 nm. The run time was set to 8 minutes. A single replicate was analyzed for phenobarbital.

9.3 STUDY VEHICLE

Methylcellulose was dissolved at 0.25% W/V in deionized water and used as the vehicle (carrier) for the test substance formulations.

9.4 FORMULATION PREPARATION AND STABILITY DETERMINATIONS

The study plan for formulation preparation and analysis development and validation, and stability testing, based on the *Technical Work Plan* for WA 5-15, was developed and documented in the Study Protocol: *Analysis of Test Substances for Work Assignment 5-15, EDSP Study Number: EDSP.515-01.* This protocol with amendments and deviations is presented in Appendix B.

The stability evaluation of linuron was not repeated for this study as it was previously evaluated in a 0.25% methylcellulose vehicle for WA 2-28. Stock and diluter formulation concentrations for phenobarbital were prepared in the 0.25% methylcellulose vehicle for determining stability (Table 7). Formulations were analyzed in triplicate for calculation of a mean concentration and relative standard deviation (RSD).

A 2.5 g/L (0.25%) methylcellulose solution was prepared by adding 700 mL of deionized water to a one liter flask. The flask was placed on a hot plate and stirred while adding 2.5 grams of methylcellulose. The solution was then carefully brought to a boil. The solution was allowed to cool and then allowed to stir for 2 hours. The solution was then transferred to a one liter volumetric flask and diluted to the mark with deionized water. The solution was stored at 2-8°C.

Formulations for phenobarbital were prepared on 9/15/2005 for testing. Briefly, for the stock solution, an amount of the test substance was passed through a six inch round 180 µm screen to insure a small particle size to maximize dissolution properties. Two phenobarbital suspensions were made up (phenobarbital is not soluble in 0.25% methylcellulose at 5 and 20 mg/mL). The 5 mg/mL suspension was made by weighing 1 gram of the sized phenobarbital into a 250 mL amber bottle with 200 mL of the methylcellulose solution (described above). A 20 mg/mL suspension of phenobarbital was prepared by weighing 4 grams of the sized phenobarbital into a 250 mL amber bottle and adding 200 mL of the 0.25% methylcellulose. The stability solutions were stored at 2-8°C.

For phenobarbital, sampling and analysis of the stability solutions was scheduled to be carried out on days 0, 7, 14, 21, and 28 of storage.

Table 7. Formulations Prepared for Phenobarbital Stability Testing

Target Conc.	Nominal Conc.	Sample ID	Stock Matrix
20 mg/ml	20.03 mg/ml	Phenobarb 20 mg/ml	0.25% methylcellulose in DI water
5 mg/ml	5.01 mg/ml	Phenobarb 5 mg/ml	0.25% methylcellulose in DI water

9.5 ANALYTICAL METHODS

Formulation stability, purity, homogeneity, and accuracy of phenobarbital were evaluated using the method described below (and provided in Appendix E). Purity, formulation accuracy, and homogeneity of linuron were evaluated using the method described below (and provided in Appendix E). The frequency of determinations and the duration of testing were selected by the Work Assignment Leader (WAL) and the chemists based on *a priori* knowledge of the stability of these chemicals in the vehicle (carrier) and usage schedule required for the dosing formulations to conduct the study.

9.5.1 Test Formulation Sampling

Prior to sampling for analysis, the phenobarbital formulations were removed from the refrigerator and allowed to come to room temperature (approximately 1 hr). The formulations were placed on stir plates and stirred to maximize dispersion uniformity of the phenobarbital. Sampling was done at 2 vertical levels in the bottles. The 1st triplicate sampling was collected at a level about 1/3 below the top of the solution. The second triplicate sampling was collected at a level about 2/3 below the top of the solution. For each sampling, 1 mL was taken, using a 3 mL syringe fitted with a 3.5 inch needle. Each 1 mL aliquot was dispensed into an individually tared 25 mL volumetric flask, weighed and the weight recorded. Each flask was then filled to the mark with acetonitrile. The flasks were agitated and 0.1 mL was removed from each and placed into individual 1.8 mL autosampler vials with 0.9 mL of the mobile phase (50% water:50% acetonitrile). The vials were capped and mixed by agitation. All solutions were then run on the HPLC. The same process was followed with the linuron sample except the sample was placed into a 100 ml volumetric flask, and the final dilution utilized 0.01 mL of the diluted suspension and 0.99 mL of the mobile phase (40% water:60% acetonitrile) into a 1.8 mL autosampler vial.

9.5.2 Analysis of Test Substances with HPLC with UV/VIS Detection

All sample analysis employed HPLC with UV/VIS detection. Conditions employed are described in Tables 8 and 9.

Table 8. Phenobarbital HPLC Conditions

HPLC System	Agilent 1100 HPLC (Palo Alto, CA)
Column	SYNERGI 4µ Hydro-RP 80A 250 X 4.6 mm 4µ HPLC column
Detector	Diode array UV/Vis, set to collect at a wavelength, 225 nm
Column Pressure Limit	250 BAR
Run Time	8 minutes
Injection Volume	5 µl
Eluent; flow pattern	50% water:50% acetonitrile, Isocratic (eluent also called mobile phase)

Table 9. Linuron HPLC Conditions

HPLC System	Agilent 1100 HPLC (Palo Alto, CA)
Column	SYNERGI 4µ Hydro-RP 80A 250 X 4.6 mm 4µ HPLC column
Detector	Diode array UV/Vis, set to collect at a wavelength, 250 nm
Column Pressure Limit	250 BAR
Run Time	12 minutes
Injection Volume	100 µl
Eluent; flow pattern	40% water:60% acetonitrile, Isocratic (eluent also called mobile phase)

Calibration of the HPLC was done individually using 5 calibration standards for each of the analytes. To start, a stock is made at a concentration of about 1000 µg/mL for each analyte. Approximately 0.0500 grams of the analyte is weighed into a 50 mL volumetric flask and diluted to the mark with acetonitrile. The phenobarbital stock is serially diluted to make standards ranging from about 1 µg/mL to 200 µg/mL using a solution that will mimic the eluent, 50% acetonitrile:50% water. For the linuron, the stock is serially diluted to make standards ranging from about 0.05 µg/mL to 5 µg/mL using a solution that will mimic the eluent, 60% acetonitrile:40% water.

9.5.3 Calibration Performance and Quality Control for both Phenobarbital and Linuron

Calibration linearity specifications for both test substances were an R^2 value of greater than or equal to 0.995. Initial and continuing calibration verification standards for both test substances (ICV and CCV) were run where each of the ICVs consisted of a solution made from an independent standard and diluted to be within the calibration range of the standards. The CCVs were mid-point calibration standards run every 10 samples to verify the analytical

system remained calibrated for the entire run. Both ICV and CCV performance standards were specified to be within 10% of target concentrations for the test substances. The purpose of an ICV is to verify that the calibration standards were properly made.

Matrix spikes and blanks were run for method validation and with each sampling for phenobarbital. A matrix spike was prepared prior to the start of the tests and was made at concentrations similar to the low dose formulation concentrations. For linuron, since homogeneity and formulation verification were the only samples run, a matrix spike would have been the same as the actual sampling, therefore, matrix spikes were deemed unnecessary.

10.0 RESULTS

10.1 TEST SUBSTANCE PURITY

The purities of linuron and phenobarbital determined by the CR were 97.69% and 99.98% respectively (Table 10), both within the protocol set accuracy window of ±3% of the values provided on the suppliers' certificates of analysis.

Table 10. Summary of Test Substance Purity

TEST SUBSTANCE	SUPPLIER REPORTED PURITY	LOT NUMBER	CR DETERMINED PURITY
Linuron	99.5%	348-8A	97.69%
Phenobarbital	99.1%	104K2600	99.98%

10.2 FORMULATION ANALYSIS RESULTS

The formulation preparation procedures developed for the test substance linuron produced a suspension with a measured concentration within 10% of the nominal concentration per protocol specifications (Table 11). The actual concentrations measured in the top 1/3 and the bottom 1/3 of the container were also within the 10 percent homogeneity (agreement) specification (Table 12). Triplicate determinations were carried out for both levels.

The phenobarbital formulation yielded concentrations that met the formulation accuracy specification (Table 11). The phenobarbital homogeneity specification was met for 4 of the 6 determinations[3] carried out (Tables 13 and 14). The chemist deduced that the issue for phenobarbital was in method precision, not suspension homogeneity.

Table 11. Nominal & Measured (Day 0) Formulation Concentration Comparisons

Test Substance	Nominal Conc (µg/mL)	Avg Measured Conc (µg/mL)	% Deviation = nominal versus measured
Linuron 30 mg/L	29940.0	27554.40	7.97%
Phenobarbital 5 mg/L	5010.5	4897.94	2.25%
Phenobarbital 20 mg/L	20025.5	19465.32	2.80%

Table 12. Formulation Homogeneity - Linuron

Test Substance	Position of Measurement	Recovery	Agreement
Linuron	Top 1/3	90.58%	3.16%
	Bottom 1/3	93.49%	

[3]A protocol deviation (EDSP.515-01-D1) was generated to document this sub-specification performance in homogeneity for the phenobarbital suspension (see Appendix B).

Table 13. Formulation Homogeneity – Phenobarbital 5 mg/mL

Test Substance	Position of Measurement	Recovery (day 1)	Agreement (day 1)	Recovery (day 7)	Agreement (day 7)	Recovery (day 14)	Agreement (day 14)
Phenobarbital 5 mg/mL	Top 1/3	91.32%	13.17%	96.96%	2.84%	97.32%	0.59%
	Bottom 1/3	104.19%		99.75%		96.75%	

Table 14. Formulation Homogeneity – Phenobarbital 20 mg/mL

Test Substance	Position of Measurement	Recovery (day 0)	Agreement (day 0)	Recovery (day 7)	Agreement (day 7)	Recovery (day 14)	Agreement (day 14)
Phenobarbital 20 mg/mL	Top 1/3	96.90%	0.63%	91.97%	10.95%	97.13%	0.93%
	Bottom 1/3	97.51%		102.62%		98.04%	

10.3 FORMULATION STABILITY RESULTS

Stability for linuron was determined in a previous study (WA 2-28 at 5 mg/mL in 0.25% methylcellulose). The results from this earlier evaluation demonstrated stability performance at ≥ 90% of the linuron target concentration for the testing period of 21 days. Dosing formulation stability for phenobarbital as a percent of nominal values is tabulated in Table 15 and plotted in Figure 1. Typical chromatograms for phenobarbital and linuron are provided in Figures 2 and 3.

Table 15. Formulation Stability Results

Test Substance	Test Duration*	Calculated Nominal Conc. ug/ml	Percent of Nominal
Phenobarbital 5 mg/ml	14 days	5010.5	91.32% to 104.2%
Phenobarbital 20 mg/ml	14 days	20025.5	91.97% to 102.6%

* Test originally scheduled to run for 28 days, test fell below recovery spec at 21 days – test terminated.

Method detection limits (MDL) and ICV/CCV recovery ranges for the two test substances are provided in Table 16. The analytical and quality control (QC) results are presented in Appendix C.

Table 16. MDL and ICV/CCV Recovery Ranges

Test Substance	Method Detection Limit	ICV/CCV Recoveries
Phenobarbital	77.76 ug/ml	99.3% to 103.6%
Linuron	Not Done[4]	97.7% to 109.3%

Calibration curves all met the R^2 criteria of 0.995, see table 17. Blanks and matrix spikes were analyzed with every batch for QC purposes. All blanks were less than 3 times the detection limit for all the compounds.

Table 17. Calibration Acceptance

Calibration Curve Date	Test Substance	R^2 Value
9/21/05	Linuron	0.99999
9/14/05	Phenobarbital	0.99998
9/15/05	Phenobarbital	0.99999
9/16/05	Phenobarbital	0.99999
9/22/05	Phenobarbital	0.99999
9/29/05	Phenobarbital	0.99999
10/6/05	Phenobarbital	0.99999

[4] The method validation, which includes MDL, was not done for linuron, a protocol deviation (EDSP.515-01-D1) was generated (see Appendix B).

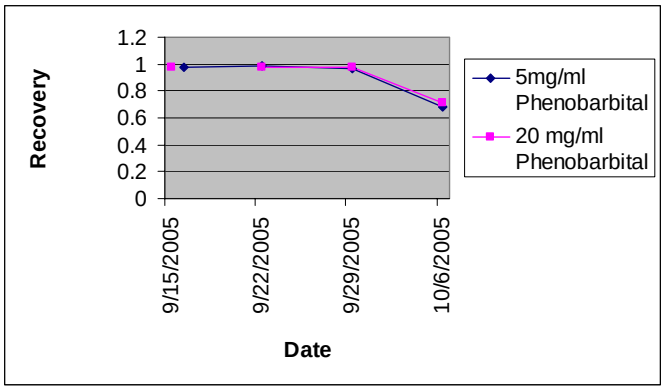


Figure 1. Recoveries of Phenobarbital Plotted Against Time

11.0 CONCLUSIONS

11.1 TEST SUBSTANCE PURITY

Purity determinations for phenobarbital and linuron, carried out by the CR, compared favorably (within 2%) to the supplier's reported results.

11.2 FORMULATION ANALYSIS

Linuron met the suspension homogeneity specification, while phenobarbital met the homogeneity specification for 4 of the 6 determinations carried out. Comparisons of the nominal and actual concentrations of the linuron formulation prepared revealed a 92.04% accuracy at 30 mg/ml. Phenobarbital formulation accuracy was 97.76% at 5 mg/mL and 97.21% at 20 mg/mL, using T=0 concentrations of the stability study. All formulations met the specification of $\pm$ 10% of nominal value.

11.3 FORMULATION STABILITY

Stability of the phenobarbital suspensions remained within 90% of the nominal concentration for the first 14 days of the 28 day stability study for both the 5 and 20 mg/mL concentrations. The study was terminated at day 21 when the recovery dropped below the 90% specification for both the 5 and 20 mg/mL suspensions.

11.4 ARCHIVING

Archive samples of the test substance employed in this study will be maintained in the EDSP Chemical Repository for the shelf life indicated on the chemical label.

The protocol, any amendments, all records and the final report generated as a result of this study will be transported to and maintained for archival purposes at the following address:

PNNL Records Management
540 Fifth Street
Richland, WA 99352
PH: 509.375.2340

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Data File D:\CHEM32\1\DATA\PHEN5\phen5000020.D
Sample Name: phen20 T 1 R1

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Acq. Operator   : timothy                            Inj :  1
 cq. Instrument : Instrument 1                  Inj Volume : 5 µl
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Method          : D:\CHEM32\1\METHODS\PHEN5.M
Last changed    : 9/15/2005 2:20:39 PM by timothy
phenobarbital method
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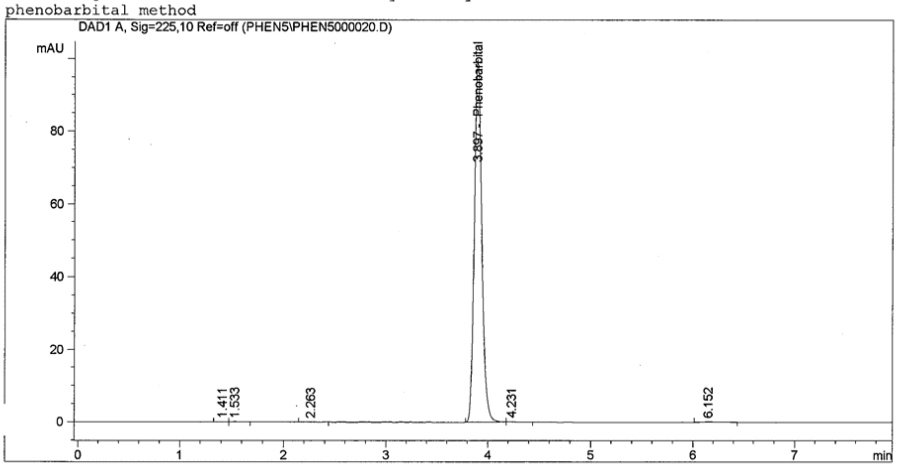


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Dilution              :      1.0000
Do not use Multiplier & Dilution Factor with ISTDs

Signal 1: DAD1 A, Sig=225,10 Ref=off
Uncalibrated Peaks    :      compound name not specified


RetTime Sig Type     Area      Amt/Area    Amount   Grp   Name
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-------|--|------|----------|----------|----------|--|---------------
  1.411  1 BV     4.13544e-1    0.00000    0.00000    ?
  1.533  1 VB     7.24195e-1    0.00000    0.00000    ?
  2.263  1 BB     1.74869e-1    0.00000    0.00000    ?
  3.897  1 BV      507.10126 1.63494e-1 1.97400e4   * Phenobarbital
  4.231  1 VB        1.21614    0.00000    0.00000    ?
  6.152  1 BB        1.71290    0.00000    0.00000    ?

Totals :                                 1.97400e4

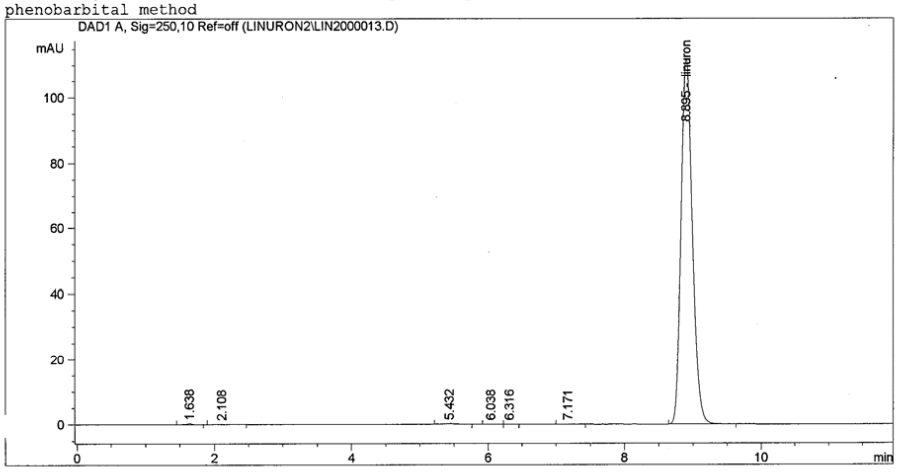
======================================================================

 Instrument 1 9/15/2005 5:24:57 PM timothy                    Page   40 of 54
```

Figure 2. Typical Chromatogram for WA 5-15 HPLC Analysis of Phenobarbital

Data File D:\CHEM32\1\DATA\LINURON2\lin2000013.D
Sample Name: Lin 30 top R-1

```
==========================================================================
Injection Date  : 9/21/2005 2:27:39 PM          Seq. Line :  13
Sample Name     : Lin 30 top R-1                 Location : Vial 13
Acq. Operator   : timothy                           Inj :   1
Acq. Instrument : Instrument 1                 Inj Volume : 100 µl
Sequence File   : D:\CHEM32\1\SEQUENCE\LINURON2.S
Method          : D:\CHEM32\1\METHODS\LINURON2.M
Last changed    : 9/21/2005 1:00:46 PM by timothy
phenobarbital method
```




```
==========================================================================
                        External Standard Report
==========================================================================

Sorted By             :      Retention Time
Calib. Data Modified  :      Wednesday, September 21, 2005 1:00:46 PM
Multiplier            :    9.259e3
Dilution              :      1.0000
Do not use Multiplier & Dilution Factor with ISTDs

Signal 1: DAD1 A, Sig=250,10 Ref=off

RetTime Sig Type     Area      Amt/Area    Amount   Grp   Name
 [min]             [mAU*s]                [ug/ml]
-------|--|------|----------|----------|----------|--|---------------
  8.895  1 BB     1285.47363 2.10147e-3 2.50128e4     linuron

Totals :                                 2.50128e4

==========================================================================
```


Figure 3. Typical Chromatogram for WA 5-15 HPLC Analysis of Linuron

APPENDIX A

SUPPLIER'S CERTIFICATES OF TEST SUBSTANCE ANALYSIS/PURITY

[redacted]

660 Tower Lane • P.O. Box 599 • West Chester, PA 19381-0599
1-800-452-9994 • 1-610-692-3026 • Fax 1-610-692-8729
info@chemservice.com • www.chemservice.com

CERTIFICATE OF ANALYSIS

INVOICE #: CS264916
PO #: 19293

CATALOG #: PS-372 CAS #: 330-55-2

DESCRIPTION: Linuron

LOT #: 348-8A

PURITY: 99.5%

EXPIRATION DATE: 08/08

Chem Service, Inc. guarantees the purity of this chemical ± 0.5% deviation prior to the expiration date shown on the label and exclusive of any customer contamination.

Two or more of the following methods of analysis are used to determine purity: Melting point, refractive index, titration, IR, TLC, GC/FID, GC/TCD, GC/ECD, GC/MS, HPLC or DSC.

Our standards are suitable for use with all EPA methods.

Certified By:

John Conrad

John Conrad
CSM/TC

SIGMA-ALDRICH

Received 8/16/05 mL
CF 2461-1

Certificate of Analysis

Product Name	Phenobarbital,
Product Number	P1636
Product Brand	Sigma
CAS Number	50-06-6
Molecular Formula	$C_{12}H_{12}N_2O_3$
Molecular Weight	232.24

TEST	SPECIFICATION	LOT 104K2600 RESULTS
APPEARANCE	WHITE POWDER	WHITE POWDER
SOLUBILITY	CLEAR COLORLESS SOLUTION AT 50MG/ML IN ETHANOL	CLEAR COLORLESS SOLUTION
IR SPECTRUM	CONSISTENT WITH STRUCTURE	CONFORMS
PURITY BY NAOH TITRATION	NLT 99%	99.1%
PURITY BY THIN LAYER CHROMATOGRAPHY	NLT 99%	GREATER THAN 99%
SHELF LIFE	5 YEARS	FEBRUARY 2010
QC ACCEPTANCE DATE		FEBRUARY 2005

Lori Schulz

Lori Schulz, Manager
Analytical Services
St. Louis, Missouri USA

SIGMA-ALDRICH

3050 Spruce Street
Saint Louis, Missouri 63105 USA
Telephone (800) 521-8956 • (314) 771-5765
Fax (800) 325-5052 • (314) 77-5757
Visit Us At www.sigma-aldrich.com

Certificate of Analysis

BATTELLE NORTHWEST
11372928MEC
MARINE SCIENCES LAB
1529 W SEQUIM BAY RD
SEQUIM WA 98382

PO NBR: CC/Smith

PRODUCT NUMBER: 274429-100G LOT NUMBER: 14601TC

PRODUCT NAME: METHYL CELLULOSE, AVERAGE MN CA. 41,000

FORMULA: C99 FORMULA WEIGHT: 0.00

APPEARANCE	WHITE POWDER
INFRARED SPECTRUM	CONFORMS TO STRUCTURE.
MISCELLANEOUS ASSAYS	29.8% METHOXYL *
LOSS ON DRYING	1.9% LOSS *
VISCOSITY	APPARENT VISCOSITY: 504 CPS (2%, H2O) *
	* SUPPLIER DATA
QUALITY CONTROL ACCEPTANCE DATE	DECEMBER 2004

ALDRICH CHEMICAL COMPANY
RONNIE MARTIN
AUGUST 9, 2005

We are Committed to the success of our Customers, Employees and Shareholders through leadership in ***Life Science, High Technology*** *and* ***Service.***

APPENDIX B

STUDY PROTOCOL, AMENDMENTS, AND DEVIATIONS

Study Protocol:
Analysis of Test Substances for Work Assignment 5-15
EDSP Study Number: EDSP.515-01

Study Objective:

The following tasks will be carried out for the (2) two test *Chemicals* as specified in Table 2:

1. Prepare and validate an analytical method as required for each of the test substances over the concentration range needed to measure the target stock concentration and the low exposure concentration (if sensitivity allows).
2. Demonstrate a viable and accurate formulation for each of the test substances, at the *Stock Solution Concentrations* listed in Table 2, in the specified carrier (methylcellulose).
3. Determine the homogeneity of any test substance that forms a suspension as described in the experimental design below.
4. Determine the stability of phenobarbital dissolved in methylcellulose (at the concentrations specified in Table 2), over a 28 day period.
5. Provide a report documenting the results on the above tasks.
6. Provide documented and validated methods, for procedures cited in 1, 2, and 3 above and identified by method number in Table 2 below, to the test laboratories specified by the EPA for the follow-on in-life studies for this work assignment.

This study is in support of EPA contract number 68-W-01-023, MSL Work Assignment Number 5-15, *Inter-laboratory Validation of the 15-Day Intact Adult Male Rat Assay.*

Address of Testing Facility:	**Address of Sponsor's Representative**
Battelle – Marine Research Operations	Battelle
1529 West Sequim Bay Road	550 King Avenue
Sequim, Washington 98382	Columbus, Ohio 43201-2693
Ph: (360) 681-4580	Ph: (614) 424-3564
FAX (360) 681-3699	FAX (614) 458-3564
Email: michael.cobb@pnl.gov	Email: houchensd@battelle.org

Proposed experimental start and termination dates:

Start Date – August 25, 2005
Termination Date – November 15, 2005

Definitions:

Test Substances: The test substances are the 2 chemicals listed in Table 2. The test substances are the subject chemicals of the tasks described in this protocol.

Reference Substance: The reference substances are identical chemicals to the test substances and may be from the same manufacturer and lot, or purchased as different lots and/or possibly from separate manufacturers than the test substances. The source, purity, and lot number of reference substances will be documented in the data and reported. Regardless of the source, the reference substance solutions will be made up separately from the test substance solutions. The reference substances (Table 1) are used for the calibration standards

in the analytical methods referenced in Table 2. A reference substance can also be a material used to facilitate the analysis of the test substance, such as an internal standard.

TABLE 1
Test Substance Abbreviations:

Chemical	Abbreviation
Linuron	Lin
Phenobarbital	φBarb

TABLE 2
Test Substance Specifications:

Chemical Name	Lin	φBarb
Manufacturer	Chem Service, Inc.	Sigma/Aldrich
CAS #	330-55-2	7601-89-0
Lot #	348-8A	104K2600
Supplier Purity requirement	≥ 97%	≥ 97%
Supplier Purity Claim	99.5%	99.1%
Target Concentration Stock Solution/Suspension	30 mg/mL	20 mg/mL
Duration Stability Study	[1]	28 Days
Concentrations for Stability Study	[1]	5 and 20 mg/mL
Carrier (Vehicle)	0.25% Methylcellulose in H_20	0.25% Methylcellulose in H_20
Analytical Method	EDSP.H4-033	EDSP.H4-034

[1] Will use data from previous EDSP Chemical Repository study (WA 2-28)
TBA = To Be Amended

Experimental Design:

- Analytical methods will be tested for each of the test substances.
- Purity of linuron and phenobarbital will be verified using High Performance Liquid Chromatography (HPLC). All purities determined should be within ±3% of the value provided on the Certificates of Analysis by the manufacturer. To use substances with values that fall outside this ±3% range or are less than 97% pure, written pre-approval must be secured from the designated EPA work assignment manager.
- Solubility of phenobarbital will be assessed visually in the carrier at the stock formulation concentration (see Table 2). Linuron has been demonstrated to be a suspension at 20 mg/mL of 0.25% methylcellulose. The specific method employed for preparation of the suspension of linuron will be the same as the method described on pages 3 and 4 of the *Chemistry Report for WA 2-28 (Revised March 28, 2005)*.
- Formulation accuracy and homogeneity of the linuron suspensions will be tested on samples collected at liquid levels approximately 1/3 and 2/3 down from the top of the liquid level in the container (with constant stirring during sampling) using the analytical methods referenced in Table 2. Sampling will be carried out in triplicate/level.
- The accuracy of attaining the target concentration for the formulations that form solutions will be verified in triplicate using the analytical methods referenced in Table 2.

- Stability test solutions – Stability testing of phenobarbital will be carried out at the stock concentration level and the low exposure concentration (as specified in Table 2), stored in the dark (i.e., same storage conditions of solutions employed in the in-life studies of WA 5-15) at room temperature. Nominal concentrations to be tested are delineated in Table 2 but the actual concentrations used for testing will be within ±10 percent of the target concentration.
- Storage and Labeling Requirements of Formulations – Stock formulations will be stored at room temperature. Minimally, containers will be uniquely labeled with the name of the test substance, the date of preparation, the formulation concentration, and the study number.
- Testing Schedule – Samples will be analyzed the day of collection from the test formulation.
- Replicates – 3 aliquots per sample tested at each analysis time point.
- Sampling schedule. – Samples will be collected for analysis at initiation of the stability study (on day of formulation preparation), then on days 7, 14, 21, and 28 of storage (if a test date falls on a holiday, testing scheduled for that date will be carried out on the closest work day).
- For details of the analytical methods see the substance specific method cited in Table 2.

Data Analysis:

The stability data collected on days 0, 7, 14, 21 and 28 (average of triplicate determinations) for phenobarbital will be compared to the nominal test concentration prepared for the study. Percent variation from the nominal concentration will be used to determine instability for phenobarbital.

Accuracy of phenobarbital and linuron formulations will be based on the average of triplicate analyses compared to the nominal values.

Homogeneity of the linuron suspensions will be based on comparisons of the average of triplicate analyses at each of the two levels within the suspensions.

Acceptance Criteria:

Acceptable stability for phenobarbital will be defined as the concentration not varying more than 10 percent from the nominal concentration over the 28 day stability period. The Work Assignment Leader will be consulted for a recommended course of action for any data found outside the ±10% acceptance range. If needed, more frequent preparation of stock solutions will be recommended for in-life studies and in-life sampling and testing will be coordinated to insure testing is carried out within the viable sample stability window.

Acceptable accuracy of formulation preparations will be ±10 percent of the target concentration.

The mean linuron concentrations measured at the top 1/3 and bottom 1/3 of the suspensions must be within 5% of one another (homogeneity). The overall actual concentration must be within 10% of the target concentration for all test results of this study.

Regulatory requirements:

This study will be conducted in compliance with EPA FIFRA Good Laboratory Practices (40 CFR, Part 160). An EDSP QA representative will inspect the study at least once while in-progress and will audit the data and final report.

Report:

A final report covering the following information for both chemicals (where applicable) will be issued to the Sponsor Representative (Dr. David Houchens, EDSP Program Manager), who will then forward the report to the testing laboratories:

Title Page
Executive Summary
Table of Contents
Introduction
General Methods
- Chemical Procurement
- Purity
- Formulation Preparation (Methods)
- Solubility and Homogeneity
- Stability Testing Plan Design and Detail
- Analytical Method

Results
- Purity
- Formulation Analysis
- Solubility and Homogeneity
- Analytical Method Validation
- Formulation Stability

Conclusions
Appendices
- Manufacturer's Certificates of Analysis
- Document to the Testing Laboratories
  - Title Page
  - Table of Contents
  - Introduction
  - Neat Chemical/Vehicle Storage Recommendations
  - Dosing Formulation Preparation Procedure
  - Dosing Formulation Storage Recommendations
  - Dosing Formulation Analysis Procedure
  - Protocol
  - Protocol Amendments
  - Protocol Deviations
  - Method Documents
  - Method Deviations

Records to be maintained:

All records, including the protocol, any amendments, and the data and final reports, generated as a result of analysis of the two test substances evaluated for this study, will be transported to and maintained for archival purposes at the following address:

PNNL Records Management
540 Fifth Street
Richland, WA 99352
PH: 509.375.2340

Approval:

Chemical Repository Study Director _____ 8/26/05
Michael Cobb **Date**

Chemical Repository Manager _____ 8/26/05
Eric Crecelius, Ph.D. **Date**

Sponsor Representative _____ 8/22/05
David Houchens, Ph. D. **Date**

PROTOCOL AMENDMENT
STUDY NUMBER: EDSP.515-01
AMENDMENT NUMBER: A-1

ENDOCRINE DISRUPTOR SCREENING PROGRAM AMENDMENT REPORT

STUDY NUMBER: EDSP.515-01				DATE: September 8, 2005	
AMENDMENT NUMBER: A-1				WAL/STUDY DIRECTOR:	
NOTEBOOK NUMBER: N/A				Dave Houchens/Michael Cobb	
TITLE OF STUDY: Analysis of Test Substances for Work Assignments 5-15					
QAPP/PROTOCOL ID: Work Assignment 5-15					
AMENDMENT RELATING TO:					
[ ]	QAPP	[ ]	QMP	[x]	Protocol
[ ]	SOP	[ ]	Method		

ORIGINAL DOCUMENT SPECIFICATIONS:

All protocol details that will be amended are indicated in bold, underlined, and in a Georgia font.

1. **Experimental Design:**

- **Solubility of phenobarbital will be assessed visually in the carrier at the stock formulation concentration (see Table 2). Linuron has been demonstrated to be a suspension at 20 mg/mL of 0.25% methylcellulose.** The specific method employed for preparation of the suspension of linuron will be the same as the method described on pages 3 and 4 of the *Chemistry Report for WA 2-28 (Revised March 28, 2005)*.
- Formulation accuracy and homogeneity of the **linuron suspensions** will be tested on samples collected at liquid levels approximately 1/3 and 2/3 down from the top of the liquid level in the containers (with constant stirring during sampling) using the analytical methods referenced in Table 2. Sampling will be carried out in triplicate/level.
- **The accuracy of attaining the target concentration for the formulations that form solutions will be verified in triplicate using the analytical methods referenced in Table 2.**
- Stability test solutions – Stability testing of phenobarbital will be carried out at the stock concentration level and the low exposure concentration (as specified in Table 2), stored in the dark (i.e., same storage conditions of solutions employed in the in-life studies of WA 5-15) at **room temperature**. Nominal concentrations to be tested are delineated in Table 2 but the actual concentrations used for testing will be within ±10 percent of the target concentration.
- Storage and Labeling Requirements of Formulations – Stock formulations will be stored at **room temperature**. Minimally, containers will be uniquely labeled with the name of the test substance, the date of preparation, the formulation concentration, and the study number.

2. **Data Analysis**

Homogeneity of the **linuron suspensions** will be based on comparisons of the average of triplicate analyses at each of the two levels within the suspensions.

3. **Acceptance Criteria**

The mean **linuron concentrations measured at the top 1/3 and bottom 1/3 of the suspensions must be within 5% of one another (homogeneity)**. The overall actual concentration must be within 10% of the target concentration for all test results of this study.

DATE: September 8, 2005

PROTOCOL AMENDMENT
STUDY NUMBER: EDSP.515-01
AMENDMENT NUMBER: A-1

AMENDMENT:

Changes are underlined

1. In the *Experimental Design* Section.

Experimental Design:

- Both linuron and phenobarbital are suspensions at the study concentrations in 0.25% methylcellulose. The specific method employed for preparation of the suspension of linuron will be the same as the method described on pages 3 and 4 of the *Chemistry Report for WA 2-28 (Revised March 28, 2005)*.
- Formulation accuracy and homogeneity of the linuron and phenobarbital suspensions will be tested on samples collected at liquid levels approximately 1/3 and 2/3 down from the top of the liquid level in the containers (with constant stirring during sampling) using the analytical methods referenced in Table 2. Sampling will be carried out in triplicate/level.
- Stability test solutions – Stability testing of phenobarbital will be carried out at the stock concentration level and the low exposure concentration (as specified in Table 2), stored in the dark (i.e., same storage conditions of solutions employed in the in-life studies of WA 5-15) at 2 to 8 degrees C. Nominal concentrations to be tested are delineated in Table 2 but the actual concentrations used for testing will be within ±10 percent of the target concentration.
- Storage and Labeling Requirements of Formulations – Stock formulations will be stored at 2 to 8 degrees C. Minimally, containers will be uniquely labeled with the name of the test substance, the date of preparation, the formulation concentration, and the study number.

2. **Data Analysis**

Homogeneity of the linuron and phenobarbital suspensions will be based on comparisons of the average of triplicate analyses at each of the two levels within the suspensions.

3. **Acceptance Criteria**

The mean linuron and phenobarbital concentrations measured at the top 1/3 and bottom 1/3 of the suspensions must be within 10% of one another (homogeneity). The overall actual concentration must be within 10% of the target concentration for all test results of this study.

REASON FOR CHANGES:

1. During the workup of the materials for the studies, it was determined that phenobarbital was a suspension and not a solution at the study concentrations. The storage temperature of the stability solutions was incorrectly identified as room temperature and should have been specified as 2 to 8 degrees C.

2. With phenobarbital shown to be a suspension, the homogeneity of the suspension requires verification so this test was added to the data analysis section.

3. During method verification, the noise in the analytical method proved too high to allow for a 5% range of consistency across the suspensions. The value was increase to 10%.

DATE: September 8, 2005

PROTOCOL AMENDMENT
STUDY NUMBER: EDSP.515-01
AMENDMENT NUMBER: A-1

Approvals:

Work Assignment Leader	Dirk P. Hawkins	Date 9/8/05
Study Director		Date 9/12/05
EDSP QA Representative	Mary E Lynn	Date 9/19/05
MSL Laboratory Director	RM Enkes	Date 9/16/05
EDSP Program Management	Dirk P. Hawkins	Date 9/8/05
EDSP Battelle QAM	Doris Pollock	Date 9-8-05

cc: Send final approved copies to:
MSL QA Manager
EDSP Battelle QAM

DATE: September 8, 2005

PROTOCOL DEVIATION
STUDY NUMBER: EDSP.515-01
DEVIATION NUMBER: D-1
DATE: January 10, 2006
Page 1 of 3

ENDOCRINE DISRUPTOR SCREENING PROGRAM DEVIATION FORM

STUDY NUMBER: EDSP.515-01				DATE: January 10, 2006	
AMENDMENT NUMBER: D-1				WAL/STUDY DIRECTOR:	
NOTEBOOK NUMBER: N/A				David Houchens/Michael Cobb	
TITLE OF STUDY: Analysis of Test Substances for Work Assignment 5-15					
QAPP/PROTOCOL ID: Work Assignment 5-15					
AMENDMENT RELATING TO:					
[ ]	QAPP	[ ]	QMP	[x]	Protocol
[ ]	SOP	[ ]	Method		

ORIGINAL DOCUMENT SPECIFICATIONS:

1. **Experimental Design:**
   - Sampling schedule. – Samples will be collected for analysis at initiation of the stability study (on day of formulation preparation), then on days 7, 14, 21, and 28 of storage (if a test date falls on a holiday, testing scheduled for that date will be carried out on the closest work day).

2. Table 2 of the protocol listed the CAS number for phenobarbital as: 7601-89-0.

3. **Study Objective**
   1. Prepare and validate an analytical method as required for each of the test substances over the concentration range needed to measure the target stock concentration and the low exposure concentration (if sensitivity allows).

4. **Acceptance Criteria:**
   The mean linuron and phenobarbital concentrations measured at the top 1/3 and bottom 1/3 of the suspensions must be within 10% of one another (homogeneity). The overall actual concentration must be within 10% of the target concentration for all test results of this study.

DEVIATION:

1A. The phenobarbital stability study at the 20 mg/mL level was terminated after analysis of the day 21 sample.

1B. Analysis of the day zero, 5 mg/mL phenobarbital, stability study sample did not provide usable results. The day zero sample analysis was repeated on the following day with viable results. This altered the stability study monitoring intervals to 1, 7, 14, and 21 days for the 5 mg/mL sample. The analysis was terminated on day 21.

2. The correct CAS number for the phenobarbital is: 50-06-6

3. The linuron method, developed for a previous study was not validated with an MDL and spikes prior to analysis of the formulation.

4. The phenobarbital formulation yielded concentrations that fell out of the 10% agreement (homogeneity) specification (for the 5 mg/mL day 0 determination and the 20 mg/mL day 7 determination).

PROTOCOL DEVIATION
STUDY NUMBER: EDSP.515-01
DEVIATION NUMBER: D-1
DATE: January 10, 2006
Page 2 of 3

REASON/IMPACT:

1A. The 20 mg/mL phenobarbital test solution remained within the acceptable stability recovery range at the 14 day sampling interval but fell below the acceptable stability range at 21 days. As a result of these findings, the Work Assignment Leader approved termination of the stability testing at 21 days. The 20 mg/mL phenobarbital sample in 0.25% methylcellulose was deemed stable for 14 days.

1B. Due to poor assay performance on day zero, the 5 mg/mL sample was rerun on the following day. The 5 mg/mL phenobarbital test solution remained within the acceptable stability recovery range at the 14 day sampling interval but fell below the acceptable stability range at 21 days. As a result of these findings, the Work Assignment Leader approved termination of the stability testing at 21 days. The 5 mg/mL phenobarbital sample in 0.25% methylcellulose was deemed stable for 14 days.

2. Used a previous protocol as a template for the 5-15 protocol and inadvertently left the CAS number from the previous study in place. No impact.

3. The linuron concentrations evaluated in the study were at a level where substantial dilutions were required prior to analysis. The system was not challenged from a sensitivity perspective so the MDL study was not carried out to reduce time expended on the project. The formulations were tested without a standard method validation with every expectation of good results and saving study hours. The formulation results demonstrated good recoveries so the shortcut in this case was justified. No impact.

4. Of the 6 homogeneity measurements carried out on the phenobarbital formulations, 4 of them met the 10% agreement specification and two were out (13.2% for the 5 mg/mL solution on day zero and 11.5% for the 20 mg/mL suspension on day 7). The analytical method was somewhat noisy and though these 2 homogeneity results fell out of spec, all the recovery determinations met the 90% to 110% requirement. Based on routine performance of the analytical method, the specification was set too low and should have been set at +/-15% agreement. No impact on validity of data and conclusions.

PROPOSED CORRECTIVE ACTION AND SCHEDULE FOR COMPLETION:
None, beyond this documentation.

ACTIONS TO PREVENT RECURRENCE:
None, beyond this documentation.

PROTOCOL DEVIATION
STUDY NUMBER: EDSP.515-01
DEVIATION NUMBER: D-1
DATE: January 10, 2006
Page 3 of 3

Approval:

Work Assignment Leader	David P. Hendricks	Date 1/12/06
Study Director	[signature]	Date 1/12/06
EDSP QA Representative	Mary E. Vojta	Date 1/12/06
MSL Laboratory Director	[signature]	Date 1/12/06
EDSP Program Management	David P. Hendricks	Date 1/12/06
EDSP Battelle QAM	Terri L. Pollard	Date 1-12-06

cc: Send final approved copies to:
MSL QA Manager
EDSP Battelle QAM

APPENDIX C

ANALYTICAL RESULTS OF STABILITY TESTING

(Note: All calculations were conducted at full precision in a spreadsheet.)

Table C1a. Phenobarbital Stability Results in Methylcellulose Vehicle for 5 mg/ml Suspension

Nominal Conc. (µg/ml)	Sample ID	Date	Measured Phenobarbital (µg/ml)	Average (µg/ml)	Recovery	RSD
5010.5	Phen5 T 1 R-1	9/16/2005	4928.13	4575.35	91.32%	10.73%
5010.5	Phen5 T 1 R-2	9/16/2005	4014.83			
5010.5	Phen5 T 1 R-3	9/16/2005	4783.11			
5010.5	Phen5 B 1 R-1	9/16/2005	6617.12	5220.53	104.19%	23.28%
5010.5	Phen5 B 1 R-2	9/16/2005	4641.06			
5010.5	Phen5 B 1 R-3	9/16/2005	4403.40			
5010.5	Phen5 T 2 R-1	9/22/2005	4407.82	4858.00	96.96%	13.92%
5010.5	Phen5 T 2 R-2	9/22/2005	5635.33			
5010.5	Phen5 T 2 R-3	9/22/2005	4530.84			
5010.5	Phen5 B 2 R-1	9/22/2005	4777.64	4997.89	99.75%	4.66%
5010.5	Phen5 B 2 R-2	9/22/2005	4974.10			
5010.5	Phen5 B 2 R-3	9/22/2005	5241.93			
5010.5	Phen5 T 3 R-1	9/29/2005	4799.77	4876.26	97.32%	3.74%
5010.5	Phen5 T 3 R-2	9/29/2005	5084.23			
5010.5	Phen5 T 3 R-3	9/29/2005	4744.80			
5010.5	Phen5 B 3 R-1	9/29/2005	5001.85	4847.42	96.75%	3.58%
5010.5	Phen5 B 3 R-2	9/29/2005	4880.99			
5010.5	Phen5 B 3 R-3	9/29/2005	4659.42			
5010.5	Phen5 T 4 R-1	10/6/2005	2914.95	3801.39	75.87%	28.10%
5010.5	Phen5 T 4 R-2	10/6/2005	4987.57			
5010.5	Phen5 T 4 R-3	10/6/2005	3501.65			
5010.5	Phen5 B 4 R-1	10/6/2005	3051.69	3032.34	60.52%	19.47%
5010.5	Phen5 B 4 R-2	10/6/2005	3612.76			
5010.5	Phen5 B 4 R-3	10/6/2005	2432.58			

Table C1b. Phenobarbital Stability Results in Methylcellulose Vehicle for 20 mg/ml Suspension

Nominal Conc. (µg/ml)	Sample ID	Date	Measured Phenobarbital (µg/ml)	Average (µg/ml)	Recovery	RSD
20025.5	Phen20 T 1 R-1	9/15/2005	19740.0	19404.23	96.90%	2.65%
20025.5	Phen20 T 1 R-2	9/15/2005	18811.8			
20025.5	Phen20 T 1 R-3	9/15/2005	19660.9			
20025.5	Phen20 B 1 R-1	9/15/2005	19399.3	19526.40	97.51%	1.23%
20025.5	Phen20 B 1 R-2	9/15/2005	19804.0			
20025.5	Phen20 B 1 R-3	9/15/2005	19375.9			
20025.5	Phen20 T 2 R-1	9/22/2005	19076.8	18417.27	91.97%	14.94%
20025.5	Phen20 T 2 R-2	9/22/2005	15395.7			
20025.5	Phen20 T 2 R-3	9/22/2005	20779.3			
20025.5	Phen20 B 2 R-1	9/22/2005	20305.6	20550.70	102.62%	3.36%
20025.5	Phen20 B 2 R-2	9/22/2005	21329.3			
20025.5	Phen20 B 2 R-3	9/22/2005	20017.2			

Table C1b. Phenobarbital Stability Results in Methylcellulose Vehicle for 20 mg/ml Suspension (continued)

Nominal Conc. (µg/ml)	Sample ID	Date	Measured Phenobarbital (µg/ml)	Average (µg/ml)	Recovery	RSD
20025.5	Phen20 T 3 R-1	9/29/2005	15888.2	19450.33	97.13%	16.14%
20025.5	Phen20 T 3 R-2	9/29/2005	21813.6			
20025.5	Phen20 T 3 R-3	9/29/2005	20649.2			
20025.5	Phen20 B 3 R-1	9/29/2005	19974.0	19634.00	98.04%	1.75%
20025.5	Phen20 B 3 R-2	9/29/2005	19288.2			
20025.5	Phen20 B 3 R-3	9/29/2005	19639.8			
20025.5	Phen20 T 4 R-1	10/6/2005	13205.2	13853.43	69.18%	8.08%
20025.5	Phen20 T 4 R-2	10/6/2005	13208.4			
20025.5	Phen20 T 4 R-3	10/6/2005	15146.7			
20025.5	Phen20 B 4 R-1	10/6/2005	14613.7	14806.70	73.94%	6.82%
20025.5	Phen20 B 4 R-2	10/6/2005	15899.3			
20025.5	Phen20 B 4 R-3	10/6/2005	13907.1			

Table C2. Homogeneity Results for Linuron in Methylcellulose Vehicle for 30 mg/ml Suspension

Nominal Conc. (µg/ml)	Sample ID	Date	Measured Linuron (µg/ml)	Average (µg/ml)	Recovery	RSD
29940	Lin 30 top R-1	9/21/2005	25012.8	27118.17	90.58%	6.83%
29940	Lin 30 top R-2	9/21/2005	27852.2			
29940	Lin 30 top R-3	9/21/2005	28489.5			
29940	Lin 30 bttm R-1	9/21/2005	28272.8	27990.63	93.49%	1.66%
29940	Lin 30 bttm R-2	9/21/2005	28243.2			
29940	Lin 30 bttm R-3	9/21/2005	27455.9			

Table C3. MDL and ICV/CCV Recovery Ranges

Test Substance	Method Detection Limit	ICV/CCV Recoveries
Phenobarbital	77.76 ug/ml	99.3% to 103.6%
Linuron	not done	97.7% to 109.3%

Table C4. Summary of Test Substance Purity

TEST SUBSTANCE	LOT NUMBER	CR DETERMINED PURITY
Phenobarbital	104K2600	99.98%
Linuron	348-8A	97.69%

Table C5a. Calibration Verification Data for Phenobarbital

Sample Name	Date	Expected Phenobarbital (µg/mL)	Measured Phenobarbital (µg/mL)	Recovery
WA515-phen-4 ICV	9/14/2005	20.08	20.15	100.34%
WA515-phen-2C CC	9/14/2005	20.04	19.90	99.32%
WA515-phen-2C CC	9/14/2005	20.04	20.09	100.27%
WA515-phen-2C CC	9/14/2005	20.04	20.02	99.90%
WA515-phen-2C CC	9/15/2005	20.04	19.96	99.59%
WA515-phen-2C CC	9/15/2005	20.04	20.20	100.79%
WA515-phen-4 ICV	9/15/2005	20.08	20.49	102.03%

Table C5a. Calibration Verification Data for Phenobarbital (continued)

Sample Name	Date	Expected Phenobarbital (µg/mL)	Measured Phenobarbital (µg/mL)	Recovery
WA515-phen-2C CC	9/15/2005	20.04	20.39	101.73%
WA515-phen-2C CC	9/15/2005	20.04	20.46	102.11%
WA515-phen-2C CC	9/15/2005	20.04	20.52	102.38%
WA515-phen-4 ICV	9/16/2005	20.08	20.42	101.69%
WA515-phen-2C CC	9/16/2005	20.04	20.43	101.97%
WA515-phen-2C CC	9/16/2005	20.04	20.52	102.38%
WA515-phen-4 ICV	9/22/2005	20.08	20.46	101.87%
WA515-phen-2C CC	9/22/2005	20.04	20.27	101.13%
WA515-phen-2C CC	9/22/2005	20.04	20.62	102.89%
WA515-phen-2C CC	9/22/2005	20.04	20.76	103.59%
WA515-phen-4 ICV	9/29/2005	20.08	20.14	100.30%
WA515-phen-2C CC	9/29/2005	20.04	20.49	102.24%
WA515-phen-2C CC	9/29/2005	20.04	20.58	102.70%
WA515-phen-2C CC	9/29/2005	20.04	20.69	103.22%
WA515-phen-4 ICV	10/6/2005	20.08	20.42	101.71%
WA515-phen-2C CC	10/6/2005	20.04	20.76	103.58%
WA515-phen-2C CC	10/6/2005	20.04	20.39	101.74%
WA515-phen-2C CC	10/6/2005	20.04	20.51	102.36%

Table C5b. Calibration Verification Data for Linuron

Sample Name	Date	Expected Linuron (µg/mL)	Measured Linuron (µg/mL)	Recovery
WA515-lin IVC	9/21/2005	0.503	0.550	109.26%
WA515-lin-1C CC	9/21/2005	0.502	0.491	97.72%
WA515-lin-1C CC	9/21/2005	0.502	0.494	98.37%

Table C6. Spike Recovery Data for Phenobarbital Analyses

Compound	Nominal Conc. (µg/mL)	Sample ID	Date	Measured (µg/mL)	Recovery
Phenobarbital	5014	WA515phen5 spk1	9/14/2005	4829.57	96.32%
Phenobarbital	5014	WA515phen5 spk2	9/14/2005	4782.08	95.37%
Phenobarbital	5014	WA515phen5 spk3	9/14/2005	4907.14	97.87%
Phenobarbital	5014	WA515phen5 spk4	9/14/2005	4596.80	91.68%
Phenobarbital	5014	WA515phen5 spk5	9/14/2005	4921.34	98.15%
Phenobarbital	5014	Blank Spike-6	9/15/2005	4749.35	94.72%
Phenobarbital	5014	Blank Spike-7	9/15/2005	4570.97	91.16%
Phenobarbital	5014	Blank Spike-8	9/22/2005	4781.64	95.37%
Phenobarbital	5014	Blank Spike-9	9/22/2005	4604.21	91.83%
Phenobarbital	5014	Blank Spike-10	9/29/2005	4658.95	92.92%
Phenobarbital	5014	Blank Spike-11	9/29/2005	4399.57	87.75%
Phenobarbital	5014	Blank Spike-12	10/6/2005	3109.98	62.03%
Phenobarbital	5014	Blank Spike-13	10/6/2005	2937.69	58.59%

Note: no spikes done with the linuron formulation verification analysis

APPENDIX D

NEAT CHEMICAL, VEHICLE, AND FORMULATION STORAGE RECOMMENDATIONS

1. Neat Chemical Storage
   A. Phenobarbital: Keep tightly closed, store at 2-8°C.
   B. Linuron: Keep tightly closed, store in a cool, dry, well-ventilated area – room temperature.

2. Formulation Storage
   A. All formulations are to be stored refrigerated (2-8°C).

APPENDIX E

ANALYTICAL METHODS EMPLOYED BY THE CHEMICAL REPOSITORY FOR WA 5-15

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Marine Sciences Laboratory

EFFECTIVE DATE: 9-8-05

Method # EDSP.H4-033-00

Battelle Pacific Northwest National Laboratories
Marine Sciences Laboratory

ANALYSIS OF LINURON IN METHYLCELLULOSE USING HPLC WITH UV/VIS DETECTION

Approvals:		
AUTHOR: Tim Fortman		9-8-05
	Signature	Date
TECHNICAL REVIEWER: Linda Bingler		9-8-05
	Signature	Date
STUDY DIRECTOR: Michael Cobb		9-8-05
	Signature	Date

ANALYSIS OF LINURON IN METHYLCELLULOSE USING HPLC WITH UV/VIS DETECTION

1.0 SCOPE AND APPLICATION

This method describes the determination of linuron in 0.25% water solution of methylcellulose using HPLC/UV/Vis detection. The method was developed for use in the analysis of phenobarbital for the EDSP program. The eluent used is an acetonitrile/water solution.

2.0 DEFINITIONS

Initial Calibration Verification (ICV)	A standard made from a neat material prepared separately from the calibration standards. Used to verify the calibration solutions. The neat material employed for preparation of the ICV can be from the same source material used for calibration.
Continuing Calibration Verification (CCV)	A mid level calibration standard run every after every 10 samples to ensure the instrument remains in calibration.

3.0 RESPONSIBLE STAFF

Researcher/Technician - sample preparation.
Analyst - analysis, calculations
QA Manager or Representative - data verification

4.0 ANALYSIS

4.1 Hardware and Reagents

- Balance capable of weighing to 0.0001 g
- High performance liquid chromatograph Agilent 1100 or equivalent
- Phenomenex SYNERGI 4µ Hydro-RP 80A 250 X 4.6 mm 4µ HPLC column or equivalent.
- Acetonitrile, HPLC grade or better.
- ~~Phenobarbital~~ Linuron, 98% purity or better.
- 1.8 mL vials
- 1 liter amber bottle with Teflon lined lid.
- Variable positive displacement Pipetters, to pipette 0.1 mL and 0.010 mL.
- Volumetric flasks

4.2 HPLC Mobile Phase (Eluent)

4.2.1 The mobile phase is 60% acetontrile and 40% water. This can be made by mixing 600 ml of acetonitrile with 400 ml of water or can be mixed by the HPLC equipment.

4.3 Calibration Solution

4.3.1 A 5 point curve is used to calibrate the HPLC over a range that will bracket the concentration in the stability tests. To start, a stock is made at a concentration of about 1000 µg/mL. Approximately 0.0500 grams is weighed into a 50 mL volumetric flask and diluted to the mark with acetontrile. Record exact information and give the solution a unique identifying label. Pour the solution into an appropriate size amber vial with a Teflon lined lid. Stability of the calibration solutions should be verified at the end of the test by the analysis of a new (freshly made) solution prepared from the neat material and compared to the calibration solutions.

4.3.2 Serially dilute the solution made in 4.3.1 to make standards ranging from 0.05 µg/ mL to 5 µg/mL using a solution that will mimic the eluent, 60% acetonitrile, 40% water.

4.4 HPLC Setup

4.4.1 The HPLC pump is set up to pump at 1.0 mL/min. The mobile phase (eluent) is degassed using either helium sparging or a vacuum degasser. The pump run time should be set to ~~9~~ 12 minutes. typo MM 1-11-06

4.4.2 The autosampler is set up to inject 100 µL. A 500 µL loop is installed. See instrument manual for setup details. The autosampler is then set to flush the contaminated surfaces with acetonitrile.

4.4.3 The column used is a Phenomenex SYNERGI 4µ Hydro-RP 80A 250 X 4.6 mm 4µ HPLC column or equivalent. Pressure limit on the column is 3000 PSI (~210 bar).

4.4.4 The detector (either a UV/Vis or a diode array detector) set to a wavelength of 250 nm.

4.5 Analysis

4.5.1 Prior to the analysis of any samples linearity must be demonstrated. A 5 point curve is run (minimum of a 4 point curve is needed). An r^2 value of ~~greater~~ equal to or than 0.995 is necessary before analysis can begin. inadvertently left out MM 1-11-06

4.5.2 Once the calibration is done, if possible it must be verified with an initial calibration verification sample (ICV). An independent solution is made and diluted to the proper concentration so that it is within the calibration range. This sample is run and the value obtained should be within 10% of the expected value.

4.5.3 After the calibration is verified, a continuing calibration verification (CCV) sample is run. This sample is usually one of the mid-level calibrators. The value obtained should be within 10% of the expected value. A CCV should be run after every 10 samples.

4.5.4 A blank should be prepared with each sampling. The blank is the matrix diluted as the samples, for this study, ~1 ml of a 0.25% methylcellulose in water solution is placed in a 25 ml volumetric flask and diluted to the mark with acetonitrile. 0.01 ml of this is placed into a 1.8 ml autosampler vial and diluted with 0.99 ml of 60% acetonitrile, 40% water. The blank should be < 3X MDL (see ~~4.5.6~~ 4.5.5). typo MM 1-11-06

4.5.5 Method Detection Limit (MDL) is determined by preparing a sample at a low concentration, using similar techniques as used to analyze the low concentration stability sample. This is done 7 times and the MDL is the students T (3.143 for 7 replicates) times the standard deviation of the seven replicate runs. An MDL should be performed prior to the analysis of any sample for linuron. Samples with no peak or quantitating at a value less than the MDL will be reported as the MDL and flagged with a "U.

4.6 Purity

4.6.1 Purity is determined by running a sample of the material that is at or near the top of the demonstrated linearity of the system. All the peaks in the purity chromatogram are summed. The peak corresponding to the linuron is then compared to all the other peaks and the purity is the area of the linuron peak divided by the sum of the total area in the chromatogram (presented as a percentage). A blank is run prior to the purity run and the peaks in the purity run that correlate to peaks in the blank run are eliminated from the calculation. This purity should be 98% or greater and should compare favorably to the purity from the vendor. Note: the limitation of using a UV/Vis detector for purity is that one cannot be certain that the impurities will absorb at the same wavelength. This purity represents an estimation.

5.0 STABILITY

at least clarification 1/11/06

5.1 A 2.5 g/L (0.25%) methyl cellulose solution is prepared by adding 700 mL of deionized water to a 1 liter flask. This solution should be prepared a day in advance of use. The flask is placed on a hot plate and a stir bar added. While the solution is being stirred, add 2.5 grams of methyl cellulose and then heat the solution to boiling. This process should be closely monitored as the solution must be removed from the hot plate immediately when boiling is observed so the material doesn't boil over. Allow the hot plate to cool, then replace the methyl cellulose solution on the plate and stir the solution for about 2 hours (to attain clarity). The solution is then transferred to a 1 liter volumetric flask and diluted to the mark with deionized water. The solution may be slightly cloudy at this point but will become clear by the next day. Store the solution at 2 to 8 degrees C.

5.2 Prior to use, the linuron is screened so that a uniform suspension can be prepared. A six inch round 180 µm screen is set up with a collection pan and a cover. The linuron is placed on the screen and the screen shaken to push the linuron through the screen.

5.2 A 30 mg/mL suspension is made by weighing 6 grams of linuron into a 250 mL amber bottle with 200 mL of the methyl cellulose solution prepared in section 5.1 (use a graduated cylinder to add the methyl cellulose solution). The slurry is stored at 2 to 8 degrees C.

5.3 Linuron has limited solubility in the methyl cellulose solution and the result is the formation of a suspension. The 250 ml amber bottle is supplied with a stir bar. The suspension is removed from the refrigerator and placed on a stir plate and stirred to suspend the linuron and warm the sample. Stir suspension for about 60 minutes prior to sampling, stirring should be vigorous enough to show a slight vortex, it should not be stirred so vigorously that air is aspirated into the solution (this may cause foaming). Visual inspection should show an evenly distributed suspension. Sampling is done by taking triple 1 ml aliquots. A 3 ml syringe equipped with a 3.5 inch needle of a wide

bore (17 gauge or wider) is used to collect the sample. A 25 ml volumetric flask is tared and using the syringe about 1 ml of the stability suspension is placed into the volumetric flask and a weight determined (and recorded). Sampling is done at 2 levels in the suspension, the first triplicate is taken at a depth of about one third of the distance from the top of the suspension. A second triplicate sample is taken from about two thirds of the way down from the top of the suspension. The volumetric flask is then filled to the mark with acetontrile. The flask is agitated and 0.01 mL is removed and placed into a 1.8 mL autosampler vial with 0.99 mL of the mobile phase (see 4.2.1). Cap the vial and mix by agitating.

5.4 Slurries are stored in amber bottles at 2 to 8 degrees C.

5.5 Samples should be analyzed on the day of sampling, but if this is not possible, samples should be stored at 4° C. until analysis. If samples are not analyzed on the day of sampling, the actual analysis date and storage conditions shall be documented.

6.0 DATA ANALYSIS AND CALCULATIONS

6.1 Prior to analysis of any samples, the instrument is calibrated with a minimum of a 4 point curve. External standard calculations will be performed. All calculations are done using chromatography software supplied with the instrument. If the software allows the input of a multiplier, determine and enter a multiplier so that the output reflects the concentration in the stability sample. For the linuron suspension, about 1 mL of the stability sample is diluted with 25 mL of acetonitrile, then 0.01 mL of this solution is diluted to 1 mL with mobile phase. A density of 1 is assumed for the 0.25% methyl cellulose and the weight in grams is equal to the volume in milliliters. The multiplier is determined by dividing the dilution factor of 2500 (0.01 ml of a 25 mL solution taken to 1 mL) by the volume of the stability solution removed. Calibration curve fits can be set to either linear or non-linear (quadratic fit), past experience indicates that even though the calibration meets linearity criteria, the quantification is improved with a non-linear fit.

7.0 QUALITY CONTROL

7.1 A blank is prepared with each sampling, this blank is the methyl cellulose solution processed identically to the stability solution. If background levels are sufficiently high (i.e., greater than 3 x MDL), this value may be subtracted from the values obtained for samples analyzed with that batch. Processing of these samples is very straight forward, therefore spikes are optional.

7.2 An initial calibration verification (ICV) standard will be analyzed following the calibration curve. Continuing calibration verification standards (CCVs) will be analyzed after every 10 samples. All samples should be bracketed with a valid CCV. If a CCV fails, perform system maintenance, recalibrate and rerun the samples not bracketed with a valid CCV.

8.0 SAFETY

All analysts following this procedure should be aware of routine laboratory safety concerns, including all safety protocols regarding use of chemicals, including the following:

- Gloves, protective clothing and safety glasses should be worn when handling samples and chemicals.

9.0 TRAINING REQUIREMENTS

10.1 All staff performing this analysis should first read this procedure and conduct their first analysis under the supervision of a staff member who has had previous experience conducting this or a similar procedure. Staff should demonstrate proficiency in the process prior to performing the work.

10.2 All staff should have received training in the handling of chemicals and the use of fume hoods.

Table 1. Summary of Data Quality Objectives and Corrective Actions

Quality Control Sample Type	Data Quality Objective (DQO)	Corrective Action
Procedural Blank one/batch	Less than 3 x MDL	Re-extract and analyze sample batch. If batch can not be re-extracted and analyzed, "B" flag all samples that are in the batch. Investigate sources of blank contamination.
Calibration curve acceptability	r^2 values greater than or equal to 0.995	If r^2 value is outside of criterion, re-analyze calibration standards, if r^2 is still out, perform instrument maintenance and/or remake calibration standards and rerun calibration samples.
Initial calibration verification (ICV) standard; one/batch	+ / - 10 % of true value	Re-calibrate. Must meet DQO in order to continue processing samples.
Continuing calibration verification standards; one every 10th sample analyzed	+/ - 10 % of true value	Re-run CCV, if still not acceptable, re-calibrate and reanalyze affected samples.
Replicate sample precision; triplicates will be analyzed for stability, duplicate for in-life	Precision: 30% as relative standard deviation (RSD) or relative percent deviation (RPD)	If RSD or RPD is not acceptable, resample and reanalyze. If reanalysis data are still not acceptable, then "*" flag the values.
Blank or Matrix Spike and spike duplicate, one set per batch (optional)	+/- 15% of true value	If recoveries are unacceptable, check the spike solution to ensure it has not degraded, also check pipettes to ensure they are delivering accurate volumes.

[a]DQO is based on limited sample analysis as part of method development experience, and may require adjustment when more experience with the method is available.

Table 2. Data Qualifiers[a]

U	The analyte was detected below the MDL. Note: Samples with no peaks are reported as zero.
B	Samples associated with procedural blank contamination.
*	QC sample data that does not meet the DQO acceptability criterion.
Q	The data are questionable.
D	Sample diluted for analysis. (note: this procedure outlines the dilution of the samples, data will not be D flagged unless diluted other than indicated in this SOP).

[a]Additional data qualifiers may be added as necessary.

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Marine Sciences Laboratory

EFFECTIVE DATE: 10-05-05

Method # EDSP.H4-034-01

Battelle Pacific Northwest National Laboratories
Marine Sciences Laboratory

ANALYSIS OF PHENOBARBITAL IN METHYLCELLULOSE USING HPLC WITH UV/VIS DETECTION

Approvals:		
AUTHOR: Tim Fortman		10-5-05
	Signature	Date
TECHNICAL REVIEWER: Linda Bingler		10/5/05
	Signature	Date
STUDY DIRECTOR: Michael Cobb		10/05/05
	Signature	Date

ANALYSIS OF PHENOBARBITAL IN METHYLCELLULOSE USING HPLC WITH UV/VIS DETECTION

1.0 SCOPE AND APPLICATION

This method describes the determination of phenobarbital in 0.25% water solution of methylcellulose using HPLC/UV/Vis detection. The method was developed for use in the analysis of phenobarbital for the EDSP program. The eluent used is an acetonitrile/water solution.

2.0 DEFINITIONS

Initial Calibration Verification (ICV)	A standard made from a neat material prepared separately from the calibration standards. Used to verify the calibration solutions. The neat material employed for preparation of the ICV can be from the same source material used for calibration.
Continuing Calibration Verification (CCV)	A mid level calibration standard run every after every 10 samples to ensure the instrument remains in calibration.

3.0 RESPONSIBLE STAFF

Researcher/Technician - sample preparation.
Analyst - analysis, calculations
QA Manager or Representative - data verification

4.0 ANALYSIS

4.1 Hardware and Reagents

- Balance capable of weighing to 0.0001 g
- High performance liquid chromatograph Agilent 1100 or equivalent
- Phenomenex SYNERGI 4µ Hydro-RP 80A 250 X 4.6 mm 4µ HPLC column or equivalent.
- Acetonitrile, HPLC grade or better.
- Phenobarbital, 98% purity or better.
- 1.8 mL vials
- 1 liter amber bottle with Teflon lined lid.
- Variable positive displacement Pipetters, to pipette 0.1 mL and 0.010 mL.
- Volumetric flasks

4.2 HPLC Mobile Phase (Eluent)

4.2.1 The mobile phase is 50% acetontrile and 50% water. This can be made by mixing equal volumes of acetonitrile and water or can be mixed by the HPLC equipment.

4.3 Calibration Solution

4.3.1 A 5 point curve is used to calibrate the HPLC over a range that will bracket the concentration in the stability tests. To start, a stock is made at a concentration of about 1000 µg/mL. Approximately 0.0500 grams is weighed into a 50 mL volumetric flask and diluted to the mark with acetontrile. Record exact information and give the solution a unique identifying label. Pour the solution into an appropriate size amber vial with a Teflon lined lid. Stability of the calibration solutions should be verified at the end of the test by the analysis of a new (freshly made) solution prepared from the neat material and compared to the calibration solutions.

4.3.2 Serially dilute the solution made in 4.3.1 to make standards ranging from 1 µg/mL to 200 µg/mL using a solution that will mimic the eluent, 50% acetonitrile, 50% water.

4.4 HPLC Setup

4.4.1 The HPLC pump is set up to pump at 1.0 mL/min. The mobile phase (eluent) is degassed using either helium sparging or a vacuum degasser. The pump run time should be set to 8 minutes.

4.4.2 The autosampler is set up to inject 5 µL. A 100 µL loop is installed. See instrument manual for setup details. The autosampler is then set to flush the contaminated surfaces with acetonitrile.

4.4.3 The column used is a Phenomenex SYNERGI 4µ Hydro-RP 80A 250 X 4.6 mm 4µ HPLC column or equivalent. Pressure limit on the column is 3000 PSI (~210 bar).

4.4.4 The detector (either a UV/Vis or a diode array detector) set to a wavelength of 225 nm.

4.5 Analysis

4.5.1 Prior to the analysis of any samples, linearity must be demonstrated. A 5 point curve is run (minimum of a 4 point curve is needed). An r^2 value of greater than 0.995 is necessary before analysis can begin.

4.5.2 Once the calibration is done, if possible it must be verified with an initial calibration verification sample (ICV). An independent solution is made and diluted to the proper concentration so that it is within the calibration range. This sample is run and the value obtained should be within 10% of the expected value.

4.5.3 After the calibration is verified, a continuing calibration verification (CCV) sample is run. This sample is usually one of the mid-level calibrators. The value obtained should be within 10% of the expected value. A CCV should be run after every 10 samples.

4.5.4 A blank should be prepared with each sampling. The blank is the matrix diluted as the samples, for this study, ~1 ml of a 0.25% methylcellulose in water solution is placed in a 25 ml volumetric flask and diluted to the mark with acetonitrile. 0.1 ml of this is placed into a 1.8 ml autosampler vial and diluted with 0.9 ml of 50% acetonitrile, 50% water. The blank should be < 3X MDL (see 4.5.5).

4.5.5 Method Detection Limit (MDL) is determined by preparing a sample at a low concentration, using similar techniques as used to analyze the low concentration stability sample. This is done 7 times and the MDL is the students T (3.143 for 7 replicates) times the standard deviation of the seven replicate runs. An MDL should be performed prior to the analysis of any sample for phenobarbital. Samples with no peak or quantitating at a value less than the MDL will be reported as the MDL and flagged with a "U.

4.6 Purity

4.6.1 Purity is determined by running a sample of the material that is at or near the top of the demonstrated linearity of the system. All the peaks in the purity chromatogram are summed. The peak corresponding to the phenobarbital is then compared to all the other peaks and the purity is the area of the phenobarbital peak divided by the sum of the total area in the chromatogram (presented as a percentage). A blank is run prior to the purity run and the peaks in the purity run that correlate to peaks in the blank run are eliminated from the calculation. This purity should be 98% or greater and should compare favorably to the purity from the vendor. Note: the limitation of using a UV/Vis detector for purity is that one cannot be certain that the impurities will absorb at the same wavelength. This purity represents an estimation.

5.0 STABILITY

5.1 A 2.5 g/L (0.25%) methyl cellulose solution is prepared by adding 700 mL of deionized water to a 1 liter flask. This solution should be prepared a day in advance to use. The flask is placed on a hot plate and a stir bar added. While the solution is being stirred, add 2.5 grams of methyl cellulose and then heat the solution to boiling. This process should be closely monitored as the solution must be removed from the hot plate immediately when boiling is observed so the material doesn't boil over. Allow the hot plate to cool, then replace the methyl cellulose solution on the plate and stir the solution for about 2 hours (to attain clarity). The solution is then transferred to a 1 liter volumetric flask and diluted to the mark with deionized water. The solution may be slightly cloudy at this point but will become clear by the next day. Store the solution at 2 to 8 degrees C.

5.2 Prior to use, the phenobarbital is screened so that a uniform suspension can be prepared. A six inch round 180 µm screen is set up with a collection pan and a cover. The phenobarbital is placed on the screen and the screen shaken to push the phenobarbital through the screen.

5.2 Stability for phenobarbital is to run for 28 days. Two stability suspensions are prepared. A 5 mg/mL suspension is made by weighing 1 gram of phenobarbital into a 250 mL amber bottle with 200 mL of the methyl cellulose solution prepared in section 5.1 (use a graduated cylinder to add the methyl cellulose solution). A 20 mg/mL suspension is prepared by weighing 4 grams of phenobarbital into a 250 mL amber bottle and adding 200 mL of the methyl cellulose solution (section 5.1). Stability solutions are stored at 2 to 8 degrees C.

5.3 Phenobarbital has limited solubility in the methyl cellulose solution and the result is the formation of a suspension. The 250 ml amber bottle is supplied with a stir bar. The suspension is removed from the refrigerator and placed on a stir plate and stirred to suspend the Phenobarbital and warm the sample. Stir suspension for about 60 minutes prior to sampling, stirring should be vigorous enough to show a slight vortex,

it should not be stirred so vigorously that air is aspirated into the solution (this may cause foaming). Visual inspection should show an evenly distributed suspension. Sampling is done by taking triple 1 ml aliquots. A 3 ml syringe equipped with a 3.5 inch needle of a wide bore (17 gauge or wider) is used to collect the sample. A 25 ml volumetric flask is tared and using the syringe about 1 ml of the stability suspension is placed into the volumetric flask and a weight determined (and recorded). Sampling is done at 2 levels in the suspension; the first triplicate is taken at a depth of about one third of the distance from the top of the suspension. A second triplicate sample is taken from about two thirds from the top of the suspension. The volumetric flask is then filled to the mark with acetontrile. The flask is agitated and 0.1 ml is removed and placed into a 1.8 mL autosampler vial with 0.9 mL of the mobile phase (see 4.2.1). Cap the vial and mix by agitating.

5.4 Stability solutions are stored in amber bottles at 2 to 8 degrees C.

5.5 Samples should be analyzed on the day of sampling, but if this is not possible, samples should be stored at 4° C. until analysis. If samples are not analyzed on the day of sampling, the actual analysis date and storage conditions shall be documented.

6.0 DATA ANALYSIS AND CALCULATIONS

6.1 Prior to analysis of any samples, the instrument is calibrated with a minimum of a 4 point curve. External standard calculations will be performed. All calculations are done using chromatography software supplied with the instrument. If the software allows the input of a multiplier, determine and enter a multiplier so that the output reflects the concentration in the stability sample. For phenobarbital stability, about 1 mL of the stability sample is diluted with 25 mL of acetonitrile, then 0.1 ml of this solution is diluted to 1 ml with mobile phase. A density of 1 is assumed for the 0.25% methyl cellulose and the weight in grams is equal to the volume in milliliters. The multiplier is determined by dividing the dilution factor of 250 (0.1 ml of a 25 ml solution taken to 1 ml)by the volume of the stability solution. Calibration curve fits can be set to either linear or non-linear (quadratic fit), past experience indicates that even though the calibration meets linearity criteria, the quantification is improved with a non-linear fit.

7.0 QUALITY CONTROL

7.1 A blank is prepared with each sampling, this blank is the methyl cellulose solution processed identically to the stability solution. If background levels are sufficiently high (i.e., greater than 5 x MDL), this value may be subtracted from the values obtained for samples analyzed with that batch. Processing of these samples is very straight forward, therefore spikes are optional.

7.2 An initial calibration verification (ICV) standard will be analyzed following the calibration curve. Continuing calibration verification standards (CCVs) will be analyzed after every 10 samples. All samples should be bracketed with a valid CCV. If a CCV fails, perform system maintenance, recalibrate and rerun the samples not bracketed with a valid CCV.

8.0 SAFETY

All analysts following this procedure should be aware of routine laboratory safety concerns, including all safety protocols regarding use of chemicals, including the following:

- Gloves, protective clothing and safety glasses should be worn when handling samples and chemicals.

9.0 TRAINING REQUIREMENTS

10.1 All staff performing this analysis should first read this procedure and conduct their first analysis under the supervision of a staff member who has had previous experience conducting the procedure. Staff should demonstrate proficiency in the process prior to performing the work.

10.2 All staff should have received training in the handling of chemicals and the use of fume hoods.

Table 1. Summary of Data Quality Objectives and Corrective Actions

Quality Control Sample Type	Data Quality Objective (DQO)	Corrective Action
Procedural Blank one/batch	Less than 3 x MDL	Re-extract and analyze sample batch. If batch can not be re-extracted and analyzed, "B" flag all samples that are in the batch. Investigate sources of blank contamination.
Calibration curve acceptability	r^2 values greater than or equal to 0.995	If r^2 value is outside of criterion, re-analyze calibration standards, if r^2 is still out, perform instrument maintenance and/or remake calibration standards and rerun calibration samples.
Initial calibration verification (ICV) standard; one/batch	+ / - 10 % of true value	Re-calibrate. Must meet DQO in order to continue processing samples.
Continuing calibration verification standards; one every 10th sample analyzed	+/ - 10 % of true value	Re-run CCV, if still not acceptable, re-calibrate and reanalyze affected samples.
Replicate sample precision; triplicates will be analyzed for stability, duplicate for in-life	Precision: 30% as relative standard deviation (RSD) or relative percent deviation (RPD)	If RSD or RPD is not acceptable, resample and reanalyze. If reanalysis data are still not acceptable, then "*" flag the values.
Blank or Matrix Spike and spike duplicate, one set per batch (optional)	+/- 15% of true value	If recoveries are unacceptable, check the spike solution to ensure it has not degraded, also check pipettes to ensure they are delivering accurate volumes.

[a]DQO is based on limited sample analysis as part of method development experience, and may require adjustment when more experience with the method is available.

Table 2. Data Qualifiers[a]

U	The analyte was detected below the MDL. Note: Samples with no peaks are reported as zero.
B	Samples associated with procedural blank contamination.
*	QC sample data that does not meet the DQO acceptability criterion.
Q	The data are questionable.
D	Sample diluted for analysis. (note: this procedure outlines the dilution of the samples, data will not be D flagged unless diluted other than indicated in this SOP).

[a]Additional data qualifiers may be added as necessary.

APPENDIX F

ANALYTICAL METHOD DEVIATIONS

The following method deviations were filed:

1. EDSP.H4-033-01 – Section 4.5.5 of the method outlines the procedure for carrying out an MDL. An MDL was not done for the Linuron method. The low calibration standard was used to determine that system sensitivity was sufficient for sample analysis. The signal levels were very high for the concentrations evaluated and the method had been used in a previous study with good results. As a result, to minimize hours expended on the project, the analyst decide to bypass the MDL determination.

APPENDIX C

Analyses Of Dosing Formulations (WIL Research Laboratories, LLC)

INTER-LABORATORY VALIDATION OF THE 15-DAY ADULT INTACT MALE RAT ASSAY WITH LINURON AND PHENOBARBITAL (WA 5-15)

Analyses Of Dosing Formulations

Analytical Chemistry Department

WIL Research Laboratories, LLC

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1. SUMMARY

This report provides detailed descriptions of methods using high performance liquid chromatography with ultraviolet absorbance detection to determine the concentration of linuron or phenobarbital formulated as suspensions in aqueous, 0.25% (w/v) methylcellulose. The assay procedures were transfer-validated through a careful evaluation of each assay's specificity/selectivity, calibration reproducibility, precision and accuracy.

In this study, linuron quantitation was performed using calibration standards in 40:60 deionized (DI) water:acetonitrile (ACN) at concentrations ranging from 0.050 to 5.0 µg/mL. Precision and accuracy were verified with the analysis of quality control (QC) samples (simulated formulations) at concentrations of 12 and 28 mg/mL.

Phenobarbital quantitation was performed using calibration standards in 50:50 DI water:ACN at concentrations ranging from 1.00 to 200 µg/mL. Precision and accuracy were verified with the analysis of QC samples at concentrations of 6.0 and 18 mg/mL.

Dosing formulations were assessed for linuron or phenobarbital homogeneity and analyzed for test article concentration, and the results met the protocol requirements. Linuron and phenobarbital resuspension homogeneity in formulations stored refrigerated for 13 days was assessed, and the results met WIL SOP acceptance criteria. Test article stability (both linuron and phenobarbital) in calibration samples (13 days of room temperature storage) and in formulations (13 days of refrigerated storage) was evaluated and found to meet WIL SOP acceptance criteria.

2. INTRODUCTION

This report provides detailed descriptions of methods using high performance liquid chromatography (HPLC) with ultraviolet (UV) absorbance detection to determine the concentration of linuron or phenobarbital formulated as suspensions in aqueous, 0.25% (w/v) methylcellulose (MC). The assay procedures were transfer-validated through a

careful evaluation of each assay's specificity/selectivity, calibration reproducibility, precision and accuracy. Dose formulations were assessed for linuron or phenobarbital homogeneity and analyzed for test article concentration. Linuron and phenobarbital resuspension homogeneity in formulations stored refrigerated for 13 days was also assessed. Test article stability (both linuron and phenobarbital) in processed samples (13 days of room temperature storage) and in formulations (13 days of refrigerated storage) was evaluated.

3. EXPERIMENTAL (LINURON ASSAY)

3.1. HIGH PERFORMANCE LIQUID CHROMATOGRAPHY

Instrument:	Hewlett Packard 1100 liquid chromatograph equipped with a variable wavelength UV detector, autosampler and ChemStation software, or equivalent system
Column:	Phenomenex SYNERGI 4µ Hydro-RP 80A 250 × 4.6 mm, or equivalent
Column Temperature:	Ambient
Mobile Phase:	60:40 (v/v) ACN: DI Water
Flow Rate:	1.0 mL/minute
Injection Volume:	100 µL
Wavelength:	250 nm
Retention Time:	Approximately 8.1 minutes
Run Time:	9.0 minutes

Note: Retention time varied depending on HPLC performance.

3.2. PREPARATION OF MOBILE PHASE AND DILUENT: 60:40 (V/V) ACN: DI WATER

The mobile phase was prepared by thoroughly mixing 1200 mL of ACN and 800 mL DI water. The solution was sonicated to de-gas.

3.3. PREPARATION OF CALIBRATION STOCK SOLUTION AND STANDARDS

The calibration stock solution was prepared at a concentration of 1.00 mg linuron/mL as follows. Approximately 0.0500 g of linuron (WIL log no. 6623A) was accurately weighed in a tared glass weigh funnel and transferred to a 50-mL volumetric flask with rinses of ACN. Additional ACN was added and the solution was mixed to achieve complete dissolution.

The calibration stock solution was diluted 10-fold with ACN to prepare a working stock solution at a concentration of 100 µg linuron/mL. Aliquots of the working stock solution were diluted as needed with diluent to yield calibration standards at concentrations ranging from 0.050 to 5.00 µg linuron/mL. The stock solution, working stock solution and calibration standards were freshly prepared as needed.

3.4. PREPARATION OF THE QUALITY CONTROL STOCK SOLUTION AND SAMPLES

The QC stock solution and samples were prepared only for the transfer-validation analysis. A QC stock solution was prepared at a concentration of 2.00 mg linuron/mL as follows. Approximately 0.200 g of linuron (WIL log no. 6623A) was accurately weighed in a tared glass weigh funnel and transferred to a 100-mL volumetric flask with rinses of ACN. Additional ACN was added and the solution was mixed to achieve complete dissolution.

The QC samples were prepared in triplicate at each concentration level. Appropriate aliquots of the QC stock solution and ACN were added to 50-mL polypropylene tubes containing 1.00 mL of 0.25% MC (WIL log no. 6622A) to simulate formulation samples as indicated in the following table.

Initial Concentration (mg/mL)	Vehicle Volume (mL)	Stock Volume (mL)	ACN Volume (mL)	Final Volume (mL)	Diluted Concentration (µg/mL)
12.0	1.00	6.00	33.0	40.0	300
28.0	1.00	14.0	25.0	40.0	700

The QC samples were centrifuged at 3500 rpm for approximately 5 minutes and aliquots of the supernatant fractions were diluted with diluent in autosampler vials to achieve concentrations within the calibration range. The blank QC sample was processed using the dilution scheme for the low QC sample (12.0 mg linuron/mL), but was initially diluted with diluent instead of ACN.

3.5. PREPARATION OF THE INITIAL CALIBRATION VERIFICATION STOCK SOLUTION AND SAMPLE

An initial calibration verification (ICV) stock solution was prepared at a concentration of 500 µg linuron/mL as follows. Approximately 0.050 g of linuron (WIL log no. 6623A) was accurately weighed in a tared glass weigh funnel and transferred to a 100-mL volumetric flask with rinses of ACN. Additional ACN was added and the solution was mixed to achieve complete dissolution. The ICV stock solution was diluted 200-fold with diluent to yield an ICV sample at a concentration of 2.50 µg linuron/mL. The ICV stock solution and sample were freshly prepared as needed.

3.6. FORMULATION SAMPLE PROCESSING

Samples (1.0 mL) of the formulations were transferred to 50-mL polypropylene tubes. ACN was added to each tube to bring the total volume to 40 mL, and the samples were thoroughly mixed.

Primary Dilutions

Dose Concentration (mg/mL)	Sample Volume (mL)	ACN Volume (mL)	Final Volume (mL)	Dilution Concentration (µg/mL)
10	1.00	39.0	40.0	250
20	1.00	39.0	40.0	500
30	1.00	39.0	40.0	750

The samples were centrifuged at 3500 rpm for approximately 5 minutes and aliquots of the supernatant fractions were transferred to 15-mL polypropylene tubes. The samples were diluted to 10.0 mL with diluent to obtain theoretical dilution concentrations within the calibration range. The samples were thoroughly mixed and portions of the diluted samples were transferred to amber autosampler vials for analysis.

Secondary Dilutions

Source Concentration (µg/mL)	Sample Volume (mL)	Diluent Volume (mL)	Final Volume (mL)	Final Concentration (µg/mL)
250	0.100	9.900	10.0	2.50
500	0.050	9.950	10.0	2.50
750	0.050	9.950	10.0	3.75

3.7. CALIBRATION AND QUANTITATION

Single injections were made of the calibration standards and processed QC and formulation samples. A calibration curve was constructed for each set of analyses. The linuron peak areas (y) and the theoretical concentrations of the calibration standards (x) were fit with least-squares regression analysis to the ln quadratic function:

$$\ln (y) = a \times [\ln (x)]^2 + b \times \ln (x) + c$$

Concentrations were calculated from the results of the regression analysis using Microsoft® Excel. The concentration data were transferred to another Excel spreadsheet where appropriate summary statistics, i.e., mean, standard deviation (SD), percent relative standard deviation (%RSD), percent relative error (%RE) and mean concentration as a percent of target concentration, were calculated and presented in tabular form. The concentrations of the QC and formulation samples were calculated by applying any factors to correct for dilutions or unit conversions.

4. EXPERIMENTAL (PHENOBARBITAL ASSAY)

4.1. HIGH PERFORMANCE LIQUID CHROMATOGRAPHY

Instrument:	Hewlett Packard 1100 liquid chromatograph equipped with a variable wavelength UV detector, autosampler and ChemStation software, or equivalent system
Column:	Phenomenex SYNERGI 4µ Hydro-RP 80A 250 × 4.6 mm, or equivalent
Column Temperature:	Ambient
Mobile Phase:	50:50 (v/v) ACN: DI Water
Flow Rate:	1.0 mL/minute
Injection Volume:	5 µL
Wavelength:	225 nm
Retention Time:	Approximately 3.8 minutes
Run Time:	8.0 minutes

Note: Retention time varied depending on HPLC performance.

4.2. PREPARATION OF MOBILE PHASE AND DILUENT: 50:50 (V/V) ACN:DI WATER

The mobile phase and diluent was prepared by thoroughly mixing equal volumes of ACN and DI water. The solution was sonicated to de-gas.

4.3. PREPARATION OF CALIBRATION STOCK AND STANDARD SOLUTIONS

The calibration stock solution was prepared at a concentration of 1.00 mg phenobarbital/mL as follows. Approximately 0.050 g of phenobarbital (WIL log no. 6624A) was accurately weighed in a tared glass weigh funnel and transferred to a 50-mL volumetric flask with rinses of ACN. Additional ACN was added and the solution was mixed to achieve complete dissolution.

The calibration stock solution was diluted as needed with diluent to yield calibration standards at concentrations ranging from 1.00 to 200 µg/mL. The stock solution and calibration standards were freshly prepared as needed.

4.4. PREPARATION OF THE QUALITY CONTROL STOCK SOLUTION AND SAMPLES

The QC stock solution and samples were prepared only for the transfer-validation analysis. A QC stock solution was prepared at a concentration of 1.00 mg phenobarbital/mL as follows. Approximately 0.100 g of phenobarbital (WIL log no. 6624A) was accurately weighed in a tared glass weigh funnel and transferred to a 100-mL volumetric flask with rinses of ACN. Additional ACN was added and the solution was mixed to achieve complete dissolution.

The QC samples were prepared in triplicate at each concentration level. Appropriate aliquots of the QC stock solution and ACN were added to 50-mL polypropylene tubes containing 1.00 mL of 0.25% MC (WIL log no. 6622A) to simulate formulation samples as indicated in the following table.

Initial Concentration (mg/mL)	Vehicle Volume (mL)	Stock Volume (mL)	ACN Volume (mL)	Final Volume (mL)	Diluted Concentration (µg/mL)
6.00	1.00	6.00	18.00	25.0	240
18.0	1.00	18.0	6.00	25.0	720

The QC samples were centrifuged at 3500 rpm for approximately 5 minutes and aliquots of the supernatant fractions were diluted with diluent in autosampler vials to achieve concentrations within the calibration range. The blank QC sample was processed using the dilution scheme for the low QC sample (6.00 mg phenobarbital/mL), but was initially diluted with diluent instead of ACN.

4.5. PREPARATION OF THE INITIAL CALIBRATION VERIFICATION STOCK SOLUTION AND SAMPLE

An ICV stock solution was prepared at a concentration of 1.00 mg phenobarbital/mL as follows. Approximately 0.050 g of phenobarbital (WIL log no. 6624A) was accurately weighed in a tared glass weigh funnel and transferred to a 50-mL volumetric flask with rinses of ACN. Additional ACN was added and the solution was mixed to achieve complete dissolution. The ICV stock solution was diluted 10-fold with diluent to yield an ICV sample at a concentration of 100 µg phenobarbital/mL. The ICV stock solution and sample were freshly prepared as needed.

4.6. FORMULATION SAMPLE PROCESSING

Samples (1.0 mL) of the formulations were transferred to 50-mL polypropylene tubes. ACN was added to each tube to bring the total volume to 25 mL, and the samples were thoroughly mixed.

Primary Dilutions

Dose Concentration (mg/mL)	Sample Volume (mL)	ACN Volume (mL)	Final Volume (mL)	Dilution Concentration (µg/mL)
0	1.00	24.0	25.0	0
5	1.00	24.0	25.0	200
10	1.00	24.0	25.0	400
20	1.00	24.0	25.0	800

The samples were centrifuged at 3500 rpm for approximately 5 minutes, and aliquots of the supernatant fractions were transferred to 15-mL polypropylene tubes. The samples were diluted to 1.0 mL with diluent to obtain theoretical dilution concentrations within the calibration range. The samples were thoroughly mixed and portions of the diluted samples were transferred to amber autosampler vials for analysis.

Secondary Dilutions

Source Concentration (µg/mL)	Sample Volume (mL)	Diluent Volume (mL)	Final Volume (mL)	Final Concentration (µg/mL)
0	0.100	0.900	1.00	0
200	0.100	0.900	1.00	20.0
400	0.100	0.900	1.00	40.0
800	0.100	0.900	1.00	80.0

4.7. CALIBRATION AND QUANTITATION

Single injections were made of the calibration standards and processed QC and formulation samples. A calibration curve was constructed for each set of analyses. The phenobarbital peak areas (y) and the theoretical concentrations of the calibration standards (x) were fit with least-squares regression analysis to the ln quadratic function:

$$\ln (y) = a \times [\ln (x)]^2 + b \times \ln (x) + c$$

Concentrations were calculated from the results of the regression analysis using Microsoft® Excel. The concentration data were transferred to another Excel spreadsheet where appropriate summary statistics, i.e., mean, standard deviation (SD), relative standard deviation (%RSD), percent relative error (%RE) and mean concentration as a percent of target concentration, were calculated and presented in tabular form. The concentrations of the QC and formulation samples were calculated by applying any factors to correct for dilutions or unit conversions.

5. RESULTS AND DISCUSSION (LINURON ASSAY)

Under the described chromatographic conditions, the retention time of linuron was approximately 8.1 minutes. Figures 1, 2, 3 and 4 are typical chromatograms of a calibration standard, a processed QC sample, a processed formulation sample and a processed vehicle sample, respectively. The total analysis time required for each run was approximately 9 minutes.

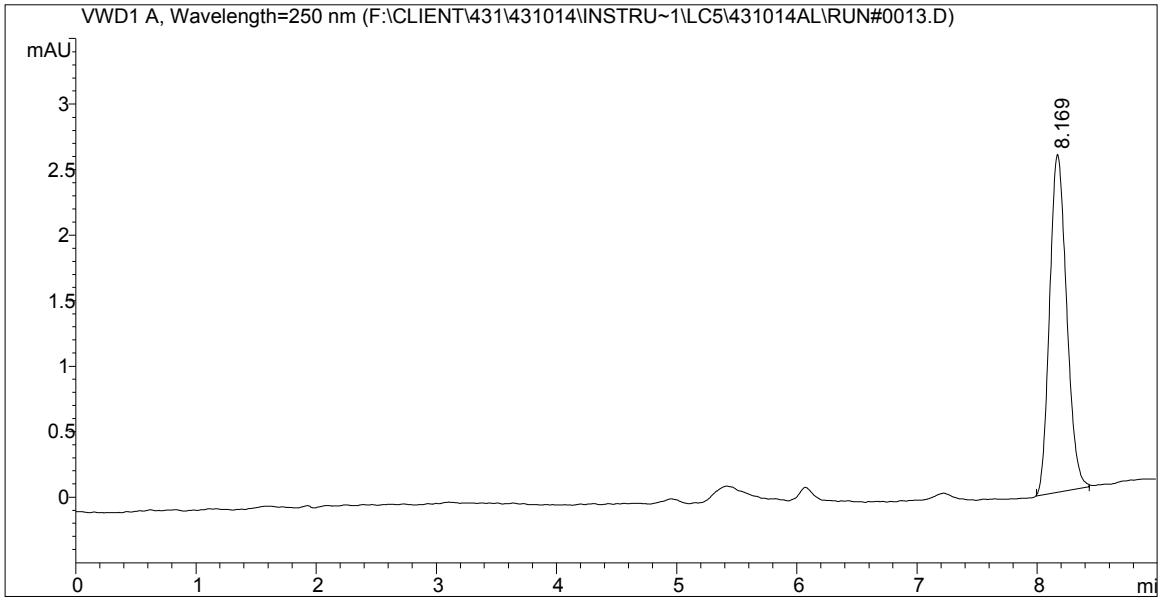

Figure 1: Representative Chromatogram Of A 0.050 µg Linuron/mL Calibration Standard

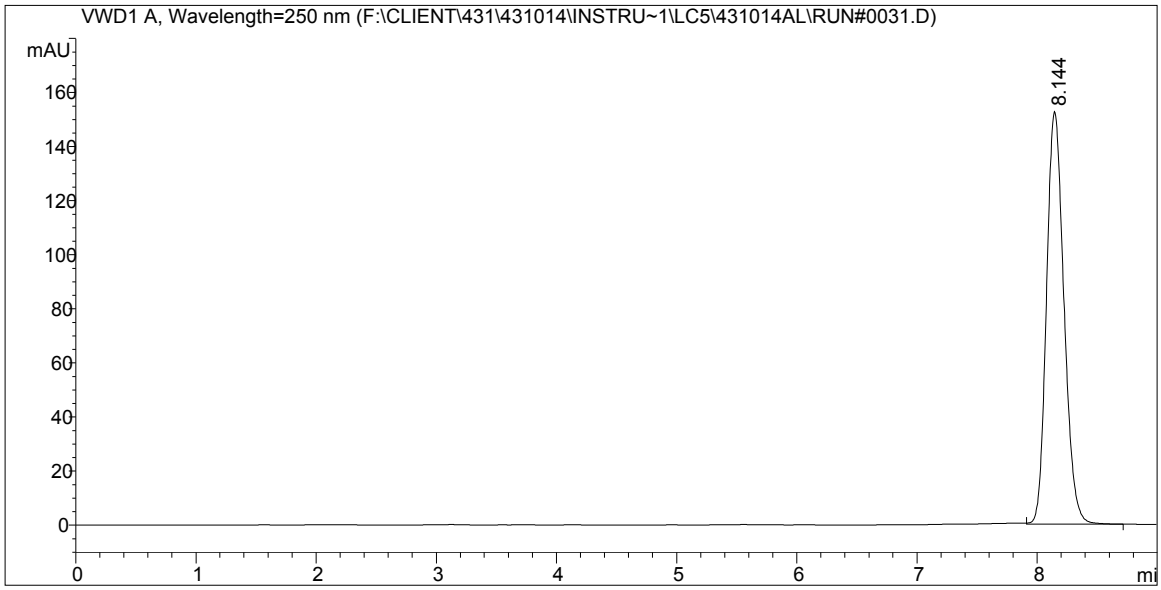

Figure 2: Representative Chromatogram Of A Processed 12 mg Linuron/mL Quality Control Sample

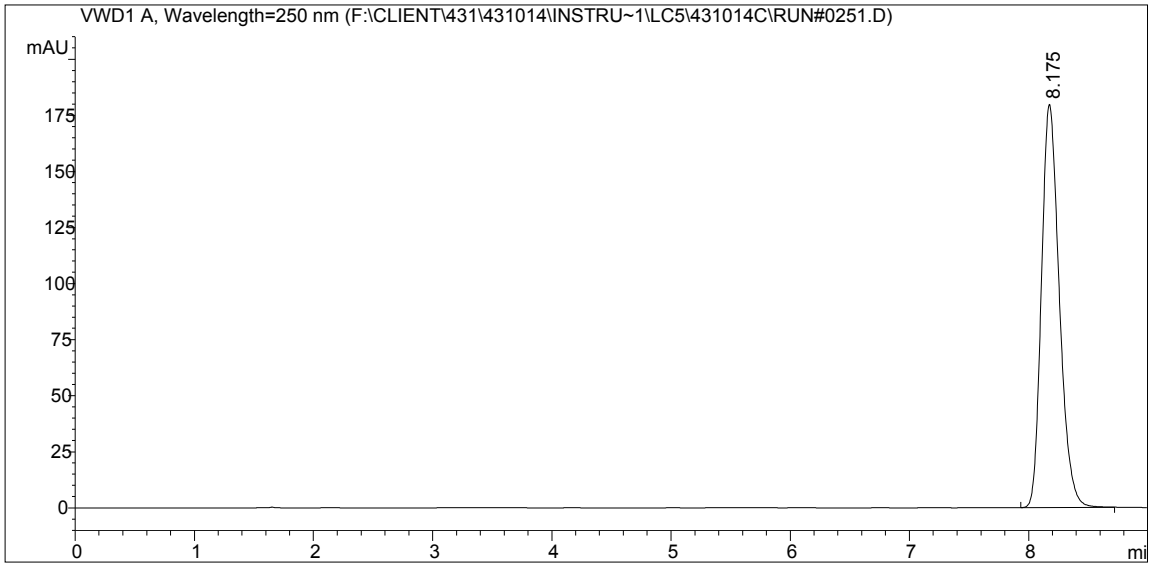

Figure 3: Representative Chromatogram Of A Processed 30 mg Linuron/mL Formulation Sample

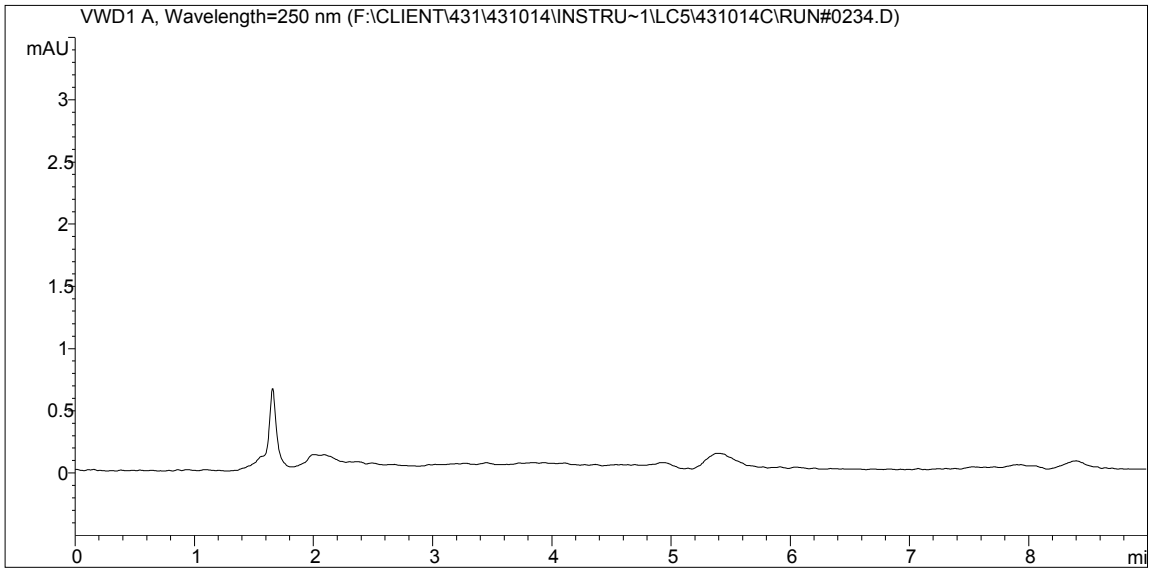

Figure 4: Representative Chromatogram Of A Processed Vehicle Sample

5.1. SPECIFICITY/SELECTIVITY

As shown in Figure 4 (and in contrast to the chromatograms shown in Figures 1 through 3), assay specificity/selectivity was confirmed when HPLC/UV analysis of the vehicle revealed that there were no significant peaks at or near the retention time for linuron (approximately 8.1 minutes).

5.2. CALIBRATION REPRODUCIBILITY

During the transfer-validation session, triplicate calibration standards at 5 concentration levels were prepared and analyzed as described previously. Single injections were made of each calibration sample. The resulting peak area versus theoretical concentration data were fit to the ln quadratic function using least-squares regression analysis. The results of the regression analyses were used to back-calculate the corresponding concentrations from the peak area data. The reproducibility of the calibration curve data was considered valid when 1) the intra-set variability, expressed as %RSD, of the back-calculated concentrations at each calibration level was ≤ 15%, except at the lowest calibration level where ≤ 20% was acceptable; and 2) the mean back-calculated concentrations at each

calibration level were within 15% of the theoretical values (%RE within ± 15% except at the lowest calibration level, where %RE within ± 20% was acceptable.

The back-calculated concentrations and the associated intra-set statistics for the linuron assay calibration samples are summarized in Table 1. The intra-set variability of the back-calculated concentrations ranged from 0.13% to 0.52% RSD. The intra-set mean concentrations had %RE values ranging from -0.19% to 0.19%. Based on the stated criteria, the reproducibility of the linuron calibration data was acceptable.

5.3. PRECISION AND ACCURACY

During the transfer-validation session, triplicate QC samples at 2 concentration levels were prepared and analyzed as described previously. Single injections were made of each QC sample. The results of the regression analyses were used to back-calculate the corresponding concentrations from these QC peak area data. The variability (%RSD) of the calculated QC concentration data was used as a measure of assay precision. The precision of the method was considered acceptable when the intra-set %RSD of the calculated concentrations at each QC level was ≤ 15%. The difference between theoretical and the calculated mean QC concentrations (%RE) was used as a measure of assay accuracy. The accuracy of the method was considered acceptable when the intra-set calculated mean concentration at each QC level had a %RE value within ± 15%.

The calculated concentrations and the associated intra-set statistics for the linuron assay QC samples are summarized in Table 2. The intra-set variability of the calculated concentrations at each QC level (precision) was 1.8% RSD. The intra-session mean concentrations had %RE values (accuracy) ranging from -0.25% to 2.2%.

Based on the stated criteria, the precision and accuracy of the linuron assay were acceptable. The peak area data for both the calibration and QC samples are summarized in Tables 3 and 4, respectively.

5.4. LINURON STABILITY IN CALIBRATION SAMPLES

Linuron calibration samples, initially analyzed on 18 October 2005, were stored at room temperature for 13 days and re-analyzed. The linuron concentrations for the calibration samples that were stored at room temperature for 13 days ranged from 99.9% to 103% of the time-zero values (Table 5). The WIL SOP requirement for stability acceptability were met because post-storage values were equal to or greater than 90% of the corresponding initial values.

5.5. HOMOGENEITY AND RESUSPENSION HOMOGENEITY ASSESSMENT OF LINURON DOSING FORMULATIONS

Samples of the 10, 20 and 30 mg linuron/mL formulations prepared on 18 October 2005 were analyzed to verify the homogeneity of the test article. Duplicate samples from the top, middle and bottom strata of each formulation were analyzed. The formulations that remained after sampling were divided into aliquots as would be used for daily dispensation. Representative aliquots were stored refrigerated for 13 days, at which time the test article was resuspended by stirring for a minimum of 10 minutes. Samples were collected from the top and bottom strata of the aliquots and analyzed to assess 13-day resuspension homogeneity. The results of the homogeneity and the 13-day resuspension homogeneity analyses are presented in Tables 6 and 7, respectively, with the overall statistics summarized in the following tables.

Homogeneity Assessment Of The 18 October 2005 Linuron Formulations

	Group B (10 mg/mL)	Group C (20 mg/mL)	Group D (30 mg/mL)
Mean Concentration (mg/mL)	9.93	19.5	28.8
SD	0.30	0.56	1.1
RSD (%)	3.0	2.9	3.8
Mean % of Target	99.3	97.6	96.1
Difference Between Mean Concentration For Top and Bottom Strata (%)	2.7	2.1	2.9

The formulations met the protocol's requirements for concentration, i.e., the %RE for the overall mean concentration was within ± 10% of the target dose concentration. The formulations also met the protocol criteria for homogeneity, i.e., the difference between the concentration of the top and bottom strata was less than 5%.

13-Day Resuspension Homogeneity Assessment Of The 18 October 2005 Linuron Formulations

	Group B (10 mg/mL)	Group C (20 mg/mL)	Group D (30 mg/mL)
Mean Concentration (mg/mL)	9.91	19.4	30.2
SD	0.15	0.42	0.64
RSD (%)	1.5	2.2	2.1
Mean % of Target	99.1	96.9	101

The formulations met the WIL SOP requirement for resuspension homogeneity, i.e., the %RSD for the overall mean concentration was 10% or less.

5.6. LINURON STABILITY IN FORMULATIONS

The linuron dosing formulations prepared and analyzed on 18 October 2005 were stored refrigerated for 13 days and re-analyzed to assess the stability of the test article in formulations. The 13-day stability results for the formulations are presented in Table 7. The post-storage mean concentrations ranged from 99.3% to 105% of the corresponding time-zero values. The test article in the formulations that were stored refrigerated for 13 days met the WIL SOP requirement for stability because the post-storage concentrations were greater than or equal to 90% of the corresponding time-zero values.

6. RESULTS AND DISCUSSION (PHENOBARBITAL ASSAY)

Under the described chromatographic conditions, the retention time of phenobarbital was approximately 3.8 minutes. Figures 1, 2, 3 and 4 are typical chromatograms of a calibration standard, a processed QC sample, a processed formulation sample and a processed vehicle sample, respectively. The total analysis time required for each run was approximately 8 minutes.

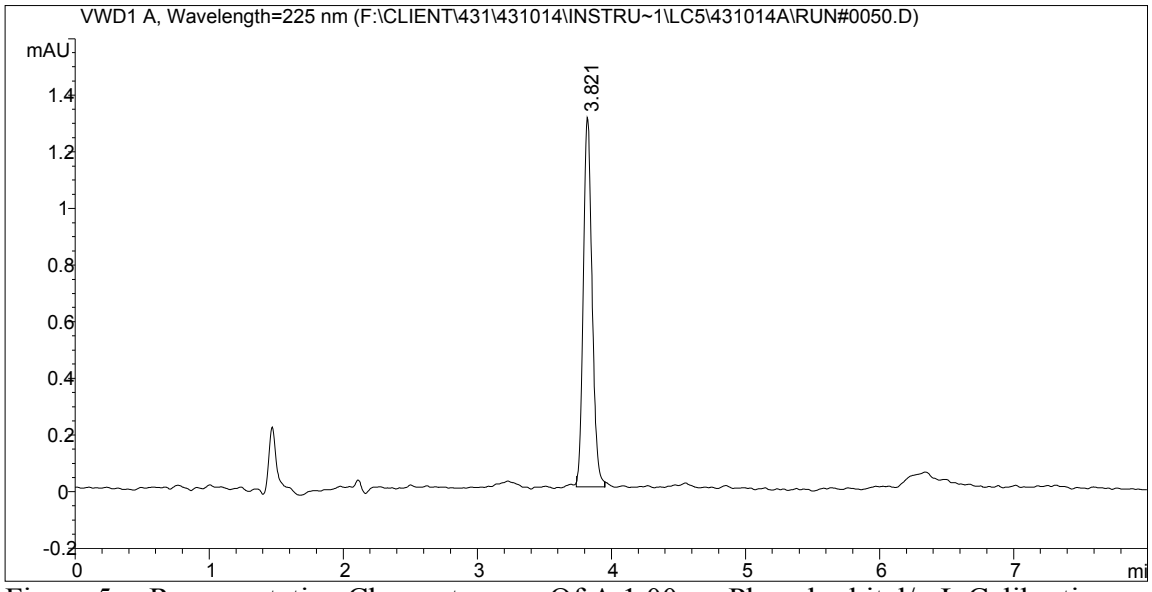

Figure 5: Representative Chromatogram Of A 1.00 µg Phenobarbital/mL Calibration Standard

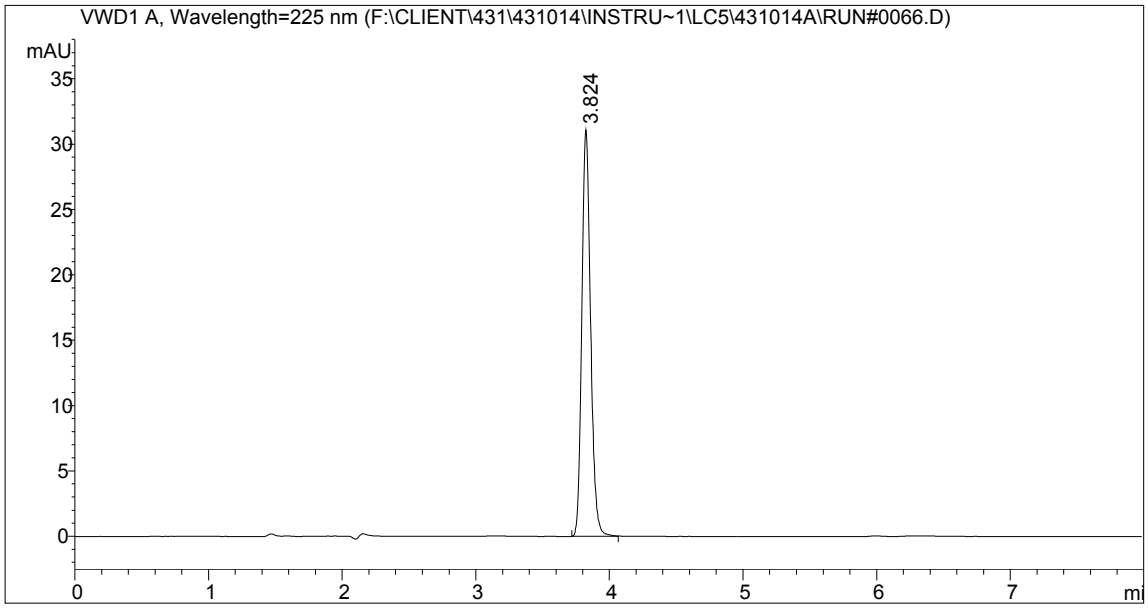

Figure 6: Representative Chromatogram Of A Processed 6.0 mg Phenobarbital/mL Quality Control Sample

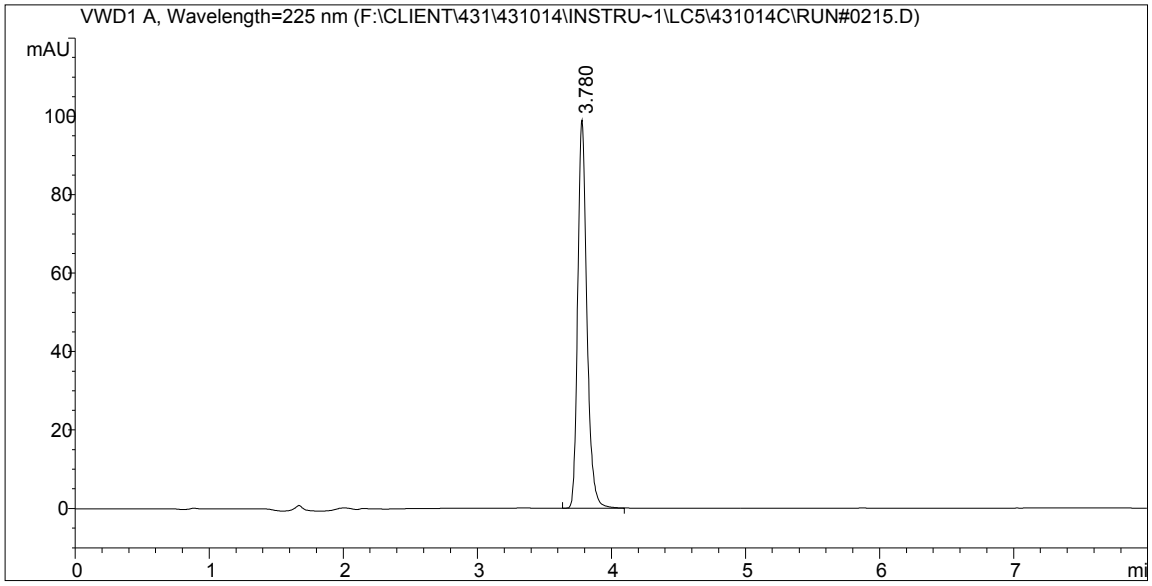

Figure 7: Representative Chromatogram Of A Processed 20 mg Phenobarbital/mL Formulation Sample

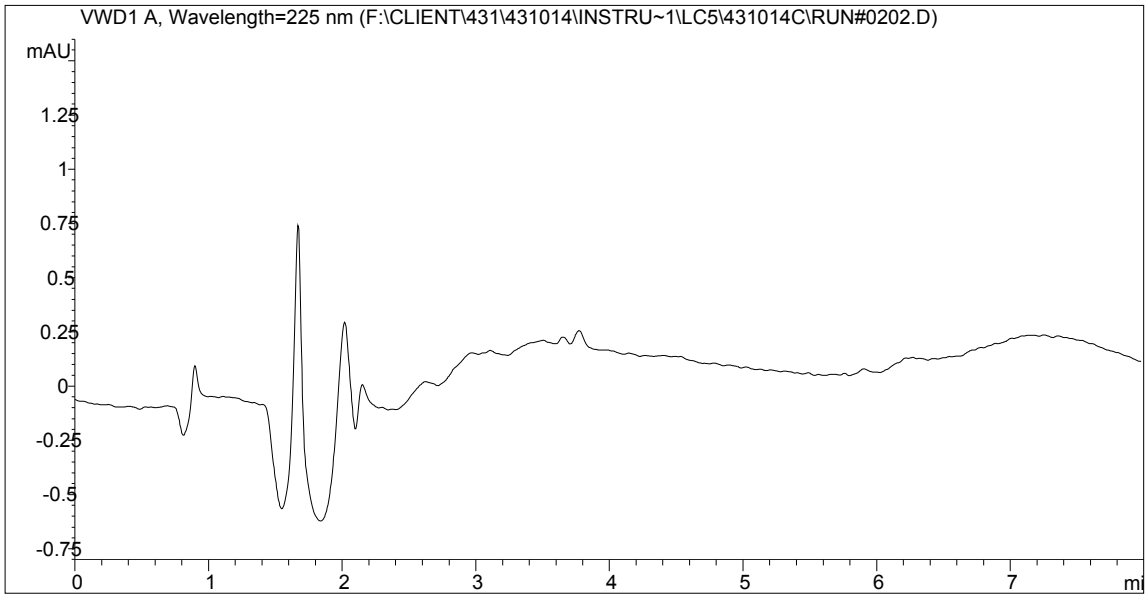

Figure 8: Representative Chromatogram Of A Processed Vehicle Sample

6.1. SPECIFICITY/SELECTIVITY

As shown in Figure 8 (and in contrast to the chromatograms shown in Figures 5 through 7), assay specificity/selectivity was confirmed when HPLC/UV analysis of the vehicle revealed that there were no significant peaks at or near the retention time for phenobarbital (approximately 3.8 minutes).

6.2. CALIBRATION REPRODUCIBILITY

During the transfer-validation session, triplicate calibration samples at 5 concentrations were prepared and analyzed as described previously. Single injections were made of each calibration sample. The resulting peak area versus theoretical concentration data were fit to the ln quadratic function using least-squares regression analysis. The results of the regression analyses were used to back-calculate the corresponding concentrations from the peak area data. The reproducibility of the calibration curve data was considered valid when 1) the intra-set variability, expressed as %RSD, of the back-calculated concentrations at each calibration level was ≤ 15%, except at the lowest calibration level where ≤ 20% was acceptable; and 2) the mean back-calculated concentrations at each

calibration level were within 15% of the theoretical values (%RE within ± 15% except at the lowest calibration level, where RE within ± 20% was acceptable.

The back-calculated concentrations and the associated intra-set statistics for the phenobarbital assay calibration samples are summarized in Table 8. The intra-set variability of the back-calculated concentrations ranged from 0.22% to 1.4% RSD. The intra-set mean concentrations had %RE values ranging from -0.52% to 0.55%. Based on the stated criteria, the reproducibility of the phenobarbital calibration data was acceptable.

6.3. PRECISION AND ACCURACY

During the transfer-validation session, triplicate QC samples at 2 concentration levels were prepared and analyzed as described previously. Single injections were made of each QC sample. The results of the regression analyses were used to back-calculate the corresponding concentrations from these QC peak area data. The variability (%RSD) of the calculated QC concentration data was used as a measure of assay precision. The precision of the method was considered acceptable when the intra-set %RSD of the calculated concentrations at each QC level was ≤ 15%. The difference between theoretical and the calculated mean QC concentrations (%RE) was used as a measure of assay accuracy. The accuracy of the method was considered acceptable when the intra-set calculated mean concentration at each QC level had a %RE value within ± 15%.

The calculated concentrations and the associated intra-set statistics for the phenobarbital assay QC samples are summarized in Table 9. The intra-set variability of the calculated concentrations at each QC level (precision) ranged from 0.32% to 0.81% RSD. The intra-session mean concentrations had %RE values (accuracy) ranging from 0.67% to 0.88%.

Based on the stated criteria, the precision and accuracy of the phenobarbital assay were acceptable. The peak area data for both the calibration and QC samples are summarized in Tables 10 and 11, respectively.

6.4. PHENOBARBITAL STABILITY IN CALIBRATION SAMPLES

Phenobarbital calibration samples, initially analyzed on 18 October 2005, were stored at room temperature for 13 days and re-analyzed. The phenobarbital concentrations for the calibration samples that were stored at room temperature for 13 days ranged from 96.9% to 101% of the time-zero values (Table 5). The WIL SOP requirement for stability acceptability was met because post-storage values were equal to or greater than 90% of the corresponding initial values.

6.5. HOMOGENEITY AND RESUSPENSION HOMOGENEITY ASSESSMENT OF PHENOBARBITAL DOSING FORMULATIONS

Samples of the 5, 10 and 20 mg phenobarbital/mL formulations prepared on 18 October 2005, were analyzed to verify the homogeneity of the test article. Duplicate samples from the top, middle and bottom strata of each formulation were analyzed. The formulations that remained after sampling were divided into aliquots as would be used for daily dispensation. Representative aliquots were stored refrigerated for 13 days, at which time the test article was resuspended by stirring for a minimum of 10 minutes. Samples were collected from the top and bottom strata of the aliquots and analyzed to assess 13-day resuspension homogeneity. The results of the homogeneity and the 13-day resuspension homogeneity analyses are presented in Tables 12 and 13, respectively, with the overall statistics summarized in the following tables.

Homogeneity Assessment Of The 18 October 2005 Phenobarbital Formulations

	Group E (5 mg/mL)	Group F (10 mg/mL)	Group G (20 mg/mL)
Mean Concentration (mg/mL)	5.25	10.3	20.6
SD	0.14	0.15	0.51
RSD (%)	2.6	1.5	2.5
Mean % of Target	105	103	103
Difference Between Mean Concentration For Top and Bottom Strata (%)	0.0	2.0	3.0

The formulations met the protocol's requirements for concentration, i.e., the %RE for the overall mean concentration was within ± 10% of the target dose concentration. The formulations also met the protocol criteria for homogeneity, i.e., the difference between the concentration of the top and bottom strata was less than 5%.

13-Day Resuspension Homogeneity Assessment Of The 18 October 2005 Phenobarbital Formulations

	Group E (5 mg/mL)	Group F (10 mg/mL)	Group G (20 mg/mL)
Mean Concentration (mg/mL)	5.54	10.7	20.9
SD	0.067	0.10	0.17
RSD (%)	1.2	0.97	0.83
Mean % of Target	111	107	105

The formulations met the WIL SOP requirement for resuspension homogeneity, i.e., the %RSD for the overall mean concentration was 10% or less.

6.6. PHENOBARBITAL STABILITY IN FORMULATIONS

The phenobarbital dosing formulations prepared and analyzed on 18 October 2005 were stored refrigerated for 13 days and re-analyzed to assess the stability of the test article in formulations. The 13-day stability results for the formulations are presented in Table 13. The post-storage mean concentrations ranged from 102% to 106% of the corresponding time-zero values. The test article in the formulations that were stored refrigerated for 13 days met the WIL SOP requirement for stability because the post-storage concentrations were greater than or equal to 90% of the corresponding time-zero values.

7. CONCLUSION

HPLC methods with UV absorbance detection for the determination of linuron or phenobarbital in aqueous suspension formulations were transfer-validated through a careful evaluation of the assay specificity/selectivity, calibration reproducibility, precision and accuracy. Linuron and phenobarbital homogeneity and concentration, as well as resuspension homogeneity and stability following 13 days of refrigerated storage were assessed, and the results met protocol or WIL SOP acceptance criteria. Test article stability in calibration samples (13 days at room temperature storage) was evaluated and found to be acceptable. Dosing formulations analyzed for test article concentration met the protocol requirement for acceptability, i.e., the mean measured concentrations were within ± 10% of the target concentrations.

8. KEY STUDY PERSONNEL AND REPORT SUBMISSION

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12 MAY 2006
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Date

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12 May 2006
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TABLES 1-13

INTER-LABORATORY VALIDATION
OF THE 15-DAY ADULT INTACT MALE RAT
ASSAY WITH LINURON AND PHENOBARBITAL (WA 5-15)

Table 1: Back-Calculated Concentrations Of The Linuron Validation Calibration Standards

Theo. Conc. (µg/mL)	**0.0500**	**0.200**	**1.00**	**2.50**	**5.00**
Transfer Validation	0.0497	0.201	1.00	2.50	5.03
(12 October 2005)	0.0499	0.200	0.999	2.49	5.00
	0.0502	0.200	0.997	2.50	5.00
Mean	0.0500	0.200	1.00	2.50	5.01
SD	0.00026	0.00067	0.0031	0.0033	0.017
%RSD	0.52	0.33	0.31	0.13	0.35
%RE	-0.077	0.19	-0.066	-0.19	0.15

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INTER-LABORATORY VALIDATION
OF THE 15-DAY ADULT INTACT MALE RAT
ASSAY WITH LINURON AND PHENOBARBITAL (WA 5-15)

Table 2: Calculated Concentrations Of The Linuron Validation Quality Control Samples

Theo. Conc. (mg/mL)	**12.0**	**28.0**
Transfer Validation (12 October 2005)	12.5	27.4
	12.1	28.0
	12.2	28.4
Mean	12.3	27.9
SD	0.22	0.49
%RSD	1.8	1.8
%RE	2.2	-0.25

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INTER-LABORATORY VALIDATION
OF THE 15-DAY ADULT INTACT MALE RAT
ASSAY WITH LINURON AND PHENOBARBITAL (WA 5-15)

Table 3: Areas Of Linuron Validation Calibration Standards

Theo. Conc. (µg/mL)	**0.0500**	**0.200**	**1.00**	**2.50**	**5.00**
Transfer Validation (12 October 2005)	25.29	102.9	514.3	1280	2572
	25.41	102.5	512.2	1277	2556
	25.55	102.2	511.2	1279	2557

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INTER-LABORATORY VALIDATION
OF THE 15-DAY ADULT INTACT MALE RAT
ASSAY WITH LINURON AND PHENOBARBITAL (WA 5-15)

Table 4: Areas Of Linuron Validation Quality Control Samples

Theo. Conc. (mg/mL)	12.0	28.0
Transfer Validation (12 October 2005)	1601	1755
	1545	1792
	1567	1817

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INTER-LABORATORY VALIDATION
OF THE 15-DAY ADULT INTACT MALE RAT
ASSAY WITH LINURON AND PHENOBARBITAL (WA 5-15)

Table 5: 13-Day Room Temperature Stability Analysis Of Prepared Calibration Standards

Comparison of Area for Phenobarbital and Linuron Calibration Standards

Time Point	Date Analyzed	Theo. Conc (µg/mL)	Ref # (431014 -)	Run #	Area	Percent of Time Zero (%)
Phenobarbital Calibration Standard						
T = 0	10/18/2005	1.00	18 - 3	83	5.763	
13-Day	10/31/2005		18 - 3	219	5.845	101
T = 0	10/18/2005	25.0	18 - 9	89	153.6	
13-Day	10/31/2005		18 - 9	220	148.9	96.9
T = 0	10/18/2005	200	18 - 15	95	1219	
13-Day	10/31/2005		18 - 15	221	1204	98.8
Linuron Calibration Standard						
		(µg/mL)				
T = 0	10/18/2005	0.0500	22 - 4	140	25.90	
13-Day	10/31/2005		22 - 4	256	26.61	103
T = 0	10/18/2005	1.00	22 - 10	146	521.3	
13-Day	10/31/2005		22 - 10	257	527.1	101
T = 0	10/18/2005	5.00	22 - 16	152	2606	
3-Day	10/31/2005		22 - 16	258	2604	99.9

Samples were prepared on 10/18/05 and stored at room temperature until 10/31/05. 431014.xls Pss13d
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INTER-LABORATORY VALIDATION
OF THE 15-DAY ADULT INTACT MALE RAT
ASSAY WITH LINURON AND PHENOBARBITAL (WA 5-15)

Table 6: Homogeneity/Concentration Assessment Of The 18 October 2005 Linuron Formulations
(Analyzed 18 October 2005)

Group	Stratum	Dose Conc (mg/mL)	Ref # (431014 -)	Run #	Analyzed Conc (mg/mL)	Percent of Target (%)	Mean Conc (mg/mL)	SD	RSD (%)	Mean Conc % of Target	Mean Conc % of Target for Stratum (%)
B	Top	10	25 - 1	157	10.2	102	9.93	0.30	3.0	99.3	99.3
			25 - 2	158	9.67	96.7					
B	Mid	10	25 - 3	159	9.64	96.4					96.9
			25 - 4	160	9.73	97.3					
B	Bot	10	25 - 5	161	9.96	99.6					102
			25 - 6	162	10.4	104					
C	Top	20	25 - 7	163	18.8	94.0	19.5	0.56	2.9	97.6	96.9
			25 - 8	164	20.0	99.8					
C	Mid	20	25 - 9	165	19.1	95.5					96.7
			25 - 10	166	19.6	97.9					
C	Bot	20	25 - 11	168	20.3	102					99.0
			25 - 12	169	19.3	96.5					
D	Top	30	25 - 13	170	28.4	94.5	28.8	1.1	3.8	96.1	93.8
			25 - 14	171	27.9	93.1					
D	Mid	30	25 - 15	172	30.4	101					98.0
			25 - 16	173	28.4	94.7					
D	Bot	30	25 - 17	174	30.1	100					96.7
			25 - 18	175	27.9	93.0					

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INTER-LABORATORY VALIDATION
OF THE 15-DAY ADULT INTACT MALE RAT
ASSAY WITH LINURON AND PHENOBARBITAL (WA 5-15)

Table 7: Resuspension Homogeneity and 13-Day Refrigerated Stability Assessment Of The 18 October 2005 Linuron Formulations
(Analyzed 31 October 2005)

Group	Stratum	Dose Conc (mg/mL)	Ref # (431014 -)	Run #	Analyzed Conc (mg/mL)	Percent of Target (%)	Mean Conc (mg/mL)	SD	RSD (%)	Mean Conc % of Target	Percent of Time Zero (%)
B	Top	10	52 - 1	243	9.90	99.0	9.91	0.15	1.5	99.1	99.8
			52 - 2	244	9.96	99.6					
B	Bot	10	52 - 3	245	10.1	101					
			52 - 4	246	9.72	97.2					
C	Top	20	52 - 5	247	19.2	96.2	19.4	0.42	2.2	96.9	99.3
			52 - 6	248	20.0	100					
C	Bot	20	52 - 7	249	19.2	96.2					
			52 - 8	250	19.0	95.2					
D	Top	30	52 - 9	251	29.7	99.0	30.2	0.64	2.1	101	105
			52 - 10	252	30.8	103					
D	Bot	30	52 - 11	254	30.6	102					
			52 - 12	255	29.5	98.5					

Time Zero Conc (mg/mL)

Group	B	9.93
Group	C	19.5
Group	D	28.8

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INTER-LABORATORY VALIDATION
OF THE 15-DAY ADULT INTACT MALE RAT
ASSAY WITH LINURON AND PHENOBARBITAL (WA 5-15)

Table 8: Back-Calculated Concentrations Of The Phenobarbital Validation Calibration Standards

Theo. Conc. (µg/mL)	**1.00**	**5.00**	**25.0**	**125**	**200**
Transfer Validation (13 October 2005)	1.01	5.03	25.1	125	201
	0.985	4.99	25.2	125	200
	1.01	4.90	25.1	124	199
Mean	1.00	4.97	25.1	125	200
SD	0.014	0.065	0.055	0.53	0.81
%RSD	1.4	1.3	0.22	0.42	0.41
%RE	0.18	-0.52	0.55	-0.23	0.035

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INTER-LABORATORY VALIDATION
OF THE 15-DAY ADULT INTACT MALE RAT
ASSAY WITH LINURON AND PHENOBARBITAL (WA 5-15)

Table 9: Calculated Concentrations Of The Phenobarbital Validation Quality Control Samples

Theo. Conc. (mg/mL)	**6.00**	**18.0**
Transfer Validation (13 October 2005)	5.99	18.2
	6.05	18.2
	6.08	18.1
Mean	6.04	18.2
SD	0.049	0.058
%RSD	0.81	0.32
%RE	0.67	0.88

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INTER-LABORATORY VALIDATION
OF THE 15-DAY ADULT INTACT MALE RAT
ASSAY WITH LINURON AND PHENOBARBITAL (WA 5-15)

Table 10: Areas Of Phenobarbital Validation Calibration Standards

Theo. Conc. (µg/mL)	**1.00**	**5.00**	**25.0**	**125**	**200**
Transfer Validation (13 October 2005)	5.933	29.91	149.9	742.0	1187
	5.788	29.69	150.4	741.7	1184
	5.934	29.16	149.8	736.5	1178

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INTER-LABORATORY VALIDATION
OF THE 15-DAY ADULT INTACT MALE RAT
ASSAY WITH LINURON AND PHENOBARBITAL (WA 5-15)

Table 11: Areas Of Phenobarbital Validation Quality Control Samples

Theo. Conc. (mg/mL)	**6.00**	**18.0**
Transfer Validation (13 October 2005)	142.9	432.3
	144.6	433.7
	145.1	430.9

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INTER-LABORATORY VALIDATION
OF THE 15-DAY ADULT INTACT MALE RAT
ASSAY WITH LINURON AND PHENOBARBITAL (WA 5-15)

Table 12: Homogeneity/Concentration Assessment Of The 18 October 2005 Phenobarbital Formulations
(Analyzed 18 October 2005)

Group	Stratum	Dose Conc (mg/mL)	Ref # (431014 -)	Run #	Analyzed Conc (mg/mL)	Percent of Target (%)	Mean Conc (mg/mL)	SD	RSD (%)	Mean Conc % of Target (%)	Mean Conc % of Target for Stratum (%)
A	Top	0	21 - 1	100		---not detected---					
			21 - 2	101		---not detected---					
A	Mid	0	21 - 3	102		---not detected---					
			21 - 4	103		---not detected---					
A	Bot	0	21 - 5	104		---not detected---					
			21 - 6	105		---not detected---					
E	Top	5	21 - 7	106	5.04	101	5.25	0.14	2.6	105	105
			21 - 8	107	5.45	109					
E	Mid	5	21 - 9	108	5.15	103					105
			21 - 10	109	5.31	106					
E	Bot	5	21 - 11	111	5.26	105					105
			21 - 12	112	5.27	105					
F	Top	10	21 - 13	113	10.3	103	10.3	0.15	1.5	103	102
			21 - 14	114	10.1	101					
F	Mid	10	21 - 15	115	10.3	103					104
			21 - 16	116	10.5	105					
F	Bot	10	21 - 17	117	10.3	103					104
			21 - 18	118	10.5	105					

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INTER-LABORATORY VALIDATION
OF THE 15-DAY ADULT INTACT MALE RAT
ASSAY WITH LINURON AND PHENOBARBITAL (WA 5-15)

Table 12: Homogeneity/Concentration Assessment Of The 18 October 2005 Phenobarbital Formulations
(Analyzed 18 October 2005)

Group	Stratum	Dose Conc (mg/mL)	Ref # (431014 -)	Run #	Analyzed Conc (mg/mL)	Percent of Target (%)	Mean Conc (mg/mL)	SD	RSD (%)	Mean Conc % of Target (%)	Mean Conc % of Target for Stratum (%)
G	Top	20	21 - 19	119	19.9	99.4	20.6	0.51	2.5	103	102
			21 - 20	120	20.8	104					
G	Mid	20	21 - 21	122	20.8	104					102
			21 - 22	123	20.0	100					
G	Bot	20	21 - 23	124	20.8	104					105
			21 - 24	125	21.2	106					

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INTER-LABORATORY VALIDATION
OF THE 15-DAY ADULT INTACT MALE RAT
ASSAY WITH LINURON AND PHENOBARBITAL (WA 5-15)

Table 13: Resuspension Homogeneity And 13-Day Refrigerated Stability Assessment Of The 18 October 2005 Phenobarbital Formulations
(Analyzed 31 October 2005)

Group	Stratum	Dose Conc (mg/mL)	Ref # (431014 -)	Run #	Analyzed Conc (mg/mL)	Percent of Target (%)	Mean Conc (mg/mL)	SD	RSD (%)	Mean Conc % of Target	Percent of Time Zero (%)
A	Top	0	48 - 1	202		---not detected---					
			48 - 2	203		---not detected---					
A	Bot	0	48 - 3	204		---not detected---					
			48 - 4	205		---not detected---					
E	Top	5	48 - 5	206	5.55	111	5.54	0.067	1.2	111	106
			48 - 6	207	5.46	109					
E	Bot	5	48 - 7	208	5.62	112					
			48 - 8	209	5.53	111					
F	Top	10	48 - 9	210	10.7	107	10.7	0.10	0.97	107	104
			48 - 10	211	10.7	107					
F	Bot	10	48 - 11	213	10.6	106					
			48 - 12	214	10.9	109					
G	Top	20	48 - 13	215	20.7	103	20.9	0.17	0.83	105	102
			48 - 14	216	21.0	105					
G	Bot	20	48 - 15	217	21.1	105					
			48 - 16	218	21.0	105					

Time Zero Conc (mg/mL)

Group	E	5.25
Group	F	10.3
Group	G	20.6

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ATTACHMENT I

Supporting Data

INTER-LABORATORY VALIDATION
OF THE 15-DAY ADULT INTACT MALE RAT
ASSAY WITH LINURON AND PHENOBARBITAL (WA 5-15)

Table 1a: Linuron Calibration Standard Data
(Analyzed 12 October 2005)

Linuron (µg/mL)	Ref # (431014 -)	Run #	Area	Mean	SD	RSD (%)	Response Factor (Mean Area/Conc.)
0.0500	2 - 3	12	25.29	25.42	0.13	0.53	5.08E+02
	2 - 4	13	25.41				
	2 - 5	14	25.55				
0.200	2 - 6	15	102.9	102.5	0.34	0.33	5.13E+02
	2 - 7	16	102.5				
	2 - 8	17	102.2				
1.00	2 - 9	18	514.3	512.6	1.6	0.31	5.13E+02
	2 - 10	19	512.2				
	2 - 11	20	511.2				
2.50	2 - 12	21	1280	1279	1.7	0.13	5.11E+02
	2 - 13	22	1277				
	2 - 14	23	1279				
5.00	2 - 15	24	2572	2561	8.8	0.34	5.12E+02
	2 - 16	25	2556				
	2 - 17	26	2557				

Overall Mean	5.11E+02
SD	1.8E+00
RSD (%)	0.36

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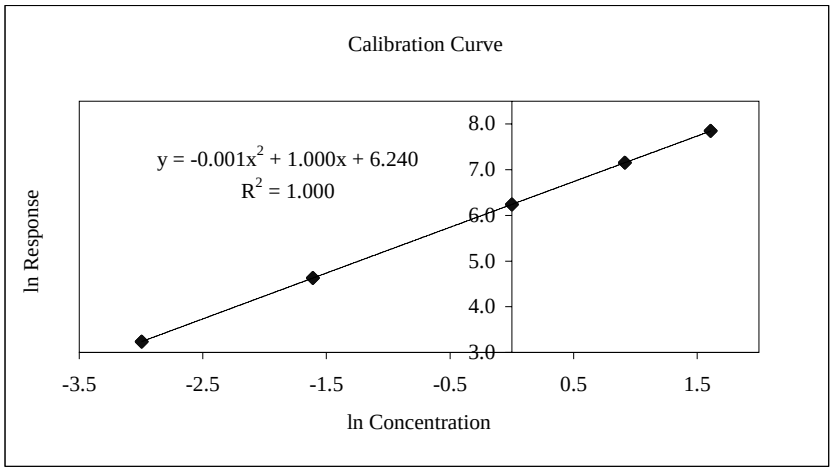
INTER-LABORATORY VALIDATION
OF THE 15-DAY ADULT INTACT MALE RAT
ASSAY WITH LINURON AND PHENOBARBITAL (WA 5-15)

Table 1b: Calibration Curve Data
(Analyzed 12 October 2005)

Ref # (431014 -)	ln Response	ln Conc	ln Conc^2	Back-Calc. Conc. (µg/mL)	RE (%)
2 - 3	3.230	-2.996	8.974	0.0497	-0.58
2 - 4	3.235	-2.996	8.974	0.0499	-0.11
2 - 5	3.241	-2.996	8.974	0.0502	0.46
2 - 6	4.634	-1.609	2.590	0.201	0.55
2 - 7	4.630	-1.609	2.590	0.200	0.11
2 - 8	4.627	-1.609	2.590	0.200	-0.11
2 - 9	6.243	0.000	0.000	1.00	0.27
2 - 10	6.239	0.000	0.000	0.999	-0.14
2 - 11	6.237	0.000	0.000	0.997	-0.33
2 - 12	7.155	0.916	0.84	2.50	-0.095
2 - 13	7.152	0.916	0.84	2.49	-0.34
2 - 14	7.154	0.916	0.84	2.50	-0.13
2 - 15	7.852	1.609	2.59	5.03	0.55
2 - 16	7.846	1.609	2.59	5.00	-0.056
2 - 17	7.846	1.609	2.59	5.00	-0.045

A	B	C	R^2
-0.001	1.000	6.240	1.000



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INTER-LABORATORY VALIDATION
OF THE 15-DAY ADULT INTACT MALE RAT
ASSAY WITH LINURON AND PHENOBARBITAL (WA 5-15)
Table 1c: Calibration Standards and Quality Controls
(Analyzed 12 October 2005)

Ref # (431014 -)	Run #	Theo. (µg/mL)	Area	ln Area	Conc. (µg/mL)	Mean (µg/mL)	SD	RSD (%)	RE (%)
Calibration Standards									
2 - 3	12	0.0500	25.29	3.230	0.0497	0.0500	0.00026	0.52	-0.077
2 - 4	13		25.41	3.235	0.0499				
2 - 5	14		25.55	3.241	0.0502				
2 - 6	15	0.200	102.9	4.634	0.201	0.200	0.00067	0.33	0.19
2 - 7	16		102.5	4.630	0.200				
2 - 8	17		102.2	4.627	0.200				
2 - 9	18	1.00	514.3	6.243	1.00	0.999	0.0031	0.31	-0.066
2 - 10	19		512.2	6.239	0.999				
2 - 11	20		511.2	6.237	0.997				
2 - 12	21	2.50	1280	7.155	2.50	2.50	0.0033	0.13	-0.19
2 - 13	22		1277	7.152	2.49				
2 - 14	23		1279	7.154	2.50				
2 - 15	24	5.00	2572	7.852	5.03	5.01	0.017	0.35	0.15
2 - 16	25		2556	7.846	5.00				
2 - 17	26		2557	7.846	5.00				
Calibration Verification Sample									
2 - 11	29	1.00	514.1	6.242	1.00	1.00	0.00033	0.033	0.25
2 - 11	36		514.3	6.243	1.00				
Initial Calibration Verification									
4 - 2	28	2.50	1252	7.132	2.44				-2.3

Quality Control Samples Ref # (431014 -)	Run #	Theo. (mg/mL)	Area	ln Area	Multi. Factor	Conc. (mg/mL)	Mean (mg/mL)	SD	RSD (%)	RE (%)
3 - 8	30	12.0	1601	7.379	4	12.5	12.3	0.22	1.8	4.2
3 - 9	31		1545	7.343	4	12.1				0.56
3 - 10	32		1567	7.357	4	12.2				2.0
3 - 11	33	28.0	1755	7.470	8	27.4	27.9	0.49	1.8	-2.1
3 - 12	34		1792	7.491	8	28.0				-0.039
3 - 13	35		1817	7.505	8	28.4				1.4
4 - 6	11	0.00	---Not Detected---							
										MDL
Method Detection Limit (MDL)										(SD * 3.143)
2 - 10	2	1.00	515.5	6.245	1	1.01	1.00	0.0014		0.0043
2 - 10	3		515.0	6.244	1	1.00				
2 - 10	4		514.6	6.243	1	1.00				
2 - 10	5		514.4	6.243	1	1.00				
2 - 10	6		514.1	6.242	1	1.00				
2 - 10	7		514.0	6.242	1	1.00				
2 - 10	8		513.4	6.241	1	1.00				

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INTER-LABORATORY VALIDATION
OF THE 15-DAY ADULT INTACT MALE RAT
ASSAY WITH LINURON AND PHENOBARBITAL (WA 5-15)

Table 2a: Phenobarbital Calibration Standard Data
(Analyzed 13 October 2005)

Phenobarbital (µg/mL)	Ref # (431014 -)	Run #	Area	Mean	SD	RSD (%)	Response Factor (Mean Area/Conc.)
1.00	7 - 2	48	5.933	5.885	0.084	1.4	5.88E+00
	7 - 3	49	5.788				
	7 - 4	50	5.934				
5.00	7 - 5	51	29.91	29.58	0.39	1.3	5.92E+00
	7 - 6	52	29.69				
	7 - 7	53	29.16				
25.0	7 - 8	54	149.9	150.0	0.33	0.22	6.00E+00
	7 - 9	55	150.4				
	7 - 10	56	149.8				
125	7 - 11	57	742.0	740	3.1	0.42	5.92E+00
	7 - 12	58	741.7				
	7 - 13	59	736.5				
200	7 - 14	60	1187	1183	4.8	0.40	5.92E+00
	7 - 15	61	1184				
	7 - 16	62	1178				

Overall Mean	5.93E+00
SD	4.3E-02
RSD (%)	0.73

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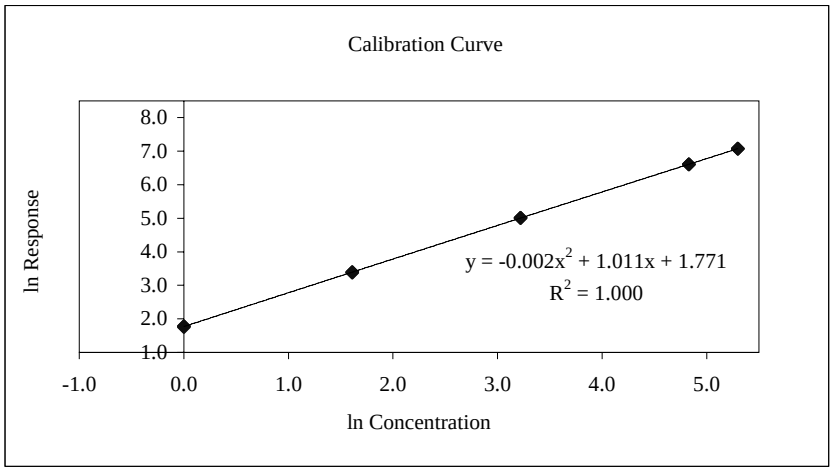
INTER-LABORATORY VALIDATION
OF THE 15-DAY ADULT INTACT MALE RAT
ASSAY WITH LINURON AND PHENOBARBITAL (WA 5-15)
Table 2b: Calibration Curve Data
(Analyzed 13 October 2005)

Ref # (431014 -)	ln Response	ln Conc	ln Conc^2	Back-Calc. Conc. (µg/mL)	RE (%)
7 - 2	1.781	0.000	0.000	1.01	1.0
7 - 3	1.756	0.000	0.000	0.985	-1.5
7 - 4	1.781	0.000	0.000	1.01	1.0
7 - 5	3.398	1.609	2.590	5.03	0.55
7 - 6	3.391	1.609	2.590	4.99	-0.17
7 - 7	3.373	1.609	2.590	4.90	-2.0
7 - 8	5.010	3.219	10.36	25.1	0.44
7 - 9	5.013	3.219	10.36	25.2	0.81
7 - 10	5.009	3.219	10.36	25.1	0.41
7 - 11	6.609	4.828	23.31	125	0.032
7 - 12	6.609	4.828	23.31	125	-0.00082
7 - 13	6.602	4.828	23.31	124	-0.71
7 - 14	7.080	5.298	28.07	201	0.40
7 - 15	7.077	5.298	28.07	200	0.11
7 - 16	7.072	5.298	28.07	199	-0.40

A	B	C	R^2
-0.002	1.011	1.771	1.000



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INTER-LABORATORY VALIDATION
OF THE 15-DAY ADULT INTACT MALE RAT
ASSAY WITH LINURON AND PHENOBARBITAL (WA 5-15)
Table 2c: Calibration Standards and Quality Controls
(Analyzed 13 October 2005)

Ref # (431014 -)	Run #	Theo. (µg/mL)	Area	ln Area	Conc. (µg/mL)	Mean (µg/mL)	SD	RSD (%)	RE (%)
Calibration Standards									
7 - 2	48	1.00	5.933	1.781	1.01	1.00	0.014	1.4	0.18
7 - 3	49		5.788	1.756	0.985				
7 - 4	50		5.934	1.781	1.01				
7 - 5	51	5.00	29.91	3.398	5.03	4.97	0.065	1.3	-0.52
7 - 6	52		29.69	3.391	4.99				
7 - 7	53		29.16	3.373	4.90				
7 - 8	54	25.0	149.9	5.010	25.1	25.1	0.055	0.22	0.55
7 - 9	55		150.4	5.013	25.2				
7 - 10	56		149.8	5.009	25.1				
7 - 11	57	125	742.0	6.609	125	125	0.53	0.42	-0.23
7 - 12	58		741.7	6.609	125				
7 - 13	59		736.5	6.602	124				
7 - 14	60	200	1187	7.080	201	200	0.81	0.41	0.035
7 - 15	61		1184	7.077	200				
7 - 16	62		1178	7.072	199				
Calibration Verification Sample									
7 - 10	65	25.0	150.3	5.013	25.2	25.2	0.035	0.14	0.63
7 - 10	72		150.0	5.011	25.1				
Initial Calibration Verification									
9 - 2	64	100	596.6	6.391	100			0.42	

Quality Control Samples Ref # (431014 -)	Run #	Theo. (mg/mL)	Area	ln Area	Multi. Factor	Conc. (mg/mL)	Mean (mg/mL)	SD	RSD (%)	RE (%)
8 - 8	66	6.00	142.9	4.962	0.25	5.99	6.04	0.049	0.81	-0.24
8 - 9	67		144.6	4.974	0.25	6.05				0.92
8 - 10	68		145.1	4.978	0.25	6.08				1.3
8 - 11	69	18.0	432.3	6.069	0.25	18.2	18.2	0.058	0.32	0.89
8 - 12	70		433.7	6.072	0.25	18.2				1.2
8 - 13	71		430.9	6.066	0.25	18.1				0.56
9 - 4	47	0.00	---Not Detected---							
										MDL
Method Detection Limit (MDL)										(SD * 3.143)
7 - 10	38	25.0	150.2	5.012	1	25.2	25.1	0.028		0.089
7 - 10	39		150.4	5.013	1	25.2				
7 - 10	40		150.1	5.011	1	25.1				
7 - 10	41		149.9	5.010	1	25.1				
7 - 10	42		150.1	5.012	1	25.2				
7 - 10	43		149.8	5.010	1	25.1				
7 - 10	44		150.0	5.011	1	25.1				

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INTER-LABORATORY VALIDATION
OF THE 15-DAY ADULT INTACT MALE RAT
ASSAY WITH LINURON AND PHENOBARBITAL (WA 5-15)

Table 3a: Phenobarbital Calibration Standard Data
(Analyzed 18 October 2005)

Phenobarbital (µg/mL)	Ref # (431014 -)	Run #	Area	Mean	SD	RSD (%)	Response Factor (Mean Area/Conc.)
1.00	18 - 2	82	5.924	5.891	0.11	1.9	5.89E+00
	18 - 3	83	5.763				
	18 - 4	84	5.985				
5.00	18 - 5	85	30.14	30.23	0.12	0.40	6.05E+00
	18 - 6	86	30.37				
	18 - 7	87	30.19				
25.0	18 - 8	88	153.4	153.2	0.54	0.35	6.13E+00
	18 - 9	89	153.6				
	18 - 10	90	152.6				
125	18 - 11	91	760.0	762	3.7	0.48	6.09E+00
	18 - 12	92	766.0				
	18 - 13	93	759.3				
200	18 - 14	94	1213	1216	3.0	0.25	6.08E+00
	18 - 15	95	1219				
	18 - 16	96	1217				

Overall Mean	6.05E+00
SD	9.2E-02
RSD (%)	1.5

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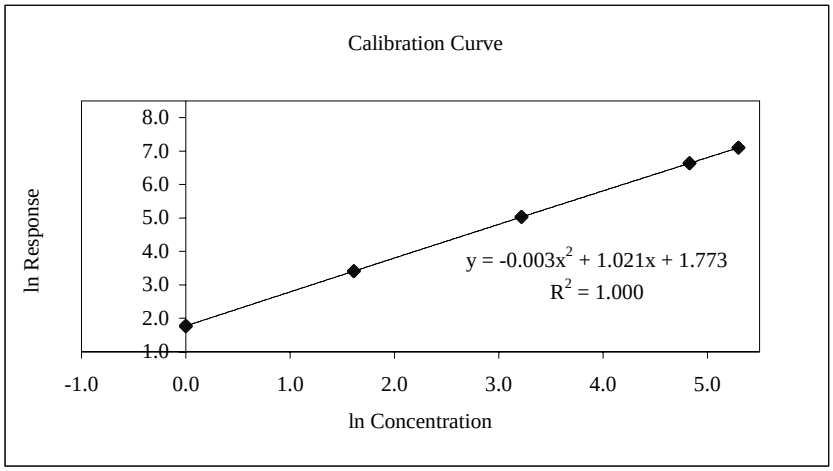
INTER-LABORATORY VALIDATION
OF THE 15-DAY ADULT INTACT MALE RAT
ASSAY WITH LINURON AND PHENOBARBITAL (WA 5-15)
Table 3b: Calibration Curve Data
(Analyzed 18 October 2005)

Ref # (431014 -)	ln Response	ln Conc	ln Conc^2	Back-Calc. Conc. (µg/mL)	RE (%)
18 - 2	1.779	0.000	0.000	1.01	0.58
18 - 3	1.752	0.000	0.000	0.979	-2.1
18 - 4	1.789	0.000	0.000	1.02	1.6
18 - 5	3.406	1.609	2.590	4.98	-0.35
18 - 6	3.413	1.609	2.590	5.02	0.39
18 - 7	3.407	1.609	2.590	4.99	-0.20
18 - 8	5.033	3.219	10.36	25.1	0.23
18 - 9	5.034	3.219	10.36	25.1	0.34
18 - 10	5.027	3.219	10.36	24.9	-0.32
18 - 11	6.633	4.828	23.31	125	-0.34
18 - 12	6.641	4.828	23.31	126	0.45
18 - 13	6.632	4.828	23.31	124	-0.43
18 - 14	7.101	5.298	28.07	200	-0.20
18 - 15	7.106	5.298	28.07	201	0.30
18 - 16	7.104	5.298	28.07	200	0.095

A	B	C	R^2
-0.003	1.021	1.773	1.000



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INTER-LABORATORY VALIDATION
OF THE 15-DAY ADULT INTACT MALE RAT
ASSAY WITH LINURON AND PHENOBARBITAL (WA 5-15)
Table 3c: Calibration Standards, Verification Samples, and Method Detection Limit
(Analyzed 18 October 2005)

Ref #	Run #	Theo.	Area	ln Area	Conc.	Mean	SD	RSD	RE
(431014 -)		(µg/mL)			(µg/mL)	(µg/mL)		(%)	(%)
Calibration Standards									
18 - 2	82	1.00	5.924	1.779	1.01	1.00	0.019	1.9	0.026
18 - 3	83		5.763	1.752	0.979				
18 - 4	84		5.985	1.789	1.02				
18 - 5	85	5.00	30.14	3.406	4.98	5.00	0.020	0.39	-0.053
18 - 6	86		30.37	3.413	5.02				
18 - 7	87		30.19	3.407	4.99				
18 - 8	88	25.0	153.4	5.033	25.1	25.0	0.088	0.35	0.085
18 - 9	89		153.6	5.034	25.1				
18 - 10	90		152.6	5.027	24.9				
18 - 11	91	125	760.0	6.633	125	125	0.61	0.48	-0.11
18 - 12	92		766.0	6.641	126				
18 - 13	93		759.3	6.632	124				
18 - 14	94	200	1213	7.101	200	200	0.50	0.25	0.063
18 - 15	95		1219	7.106	201				
18 - 16	96		1217	7.104	200				
Calibration Verification Sample									
18 - 10	99	25.0	154.2	5.038	25.2	25.2	0.097	0.38	0.66
18 - 10	110		153.4	5.033	25.1				
18 - 10	121		153.9	5.036	25.1				
18 - 10	126		154.8	5.042	25.3				
Initial Calibration Verification									
19 - 2	98	100	602.8	6.402	98.7				-1.3
Blank									
19 - 4	81	0.00	---Not Detected---						

Ref #	Run #	Theo.	Area	ln Area	Multi Factor	Conc.	Mean	SD	MDL
(431014 -)		(µg/mL)				(µg/mL)	(µg/mL)		
Method Detection Limit (MDL)									(SD * 3.143)
18 - 6	73	5.00	30.45	3.416	1	5.03	5.05	0.012	0.038
18 - 6	74		30.52	3.418	1	5.04			
18 - 6	75		30.61	3.421	1	5.06			
18 - 6	76		30.54	3.419	1	5.05			
18 - 6	77		30.65	3.423	1	5.07			
18 - 6	78		30.65	3.423	1	5.07			
18 - 6	79		30.56	3.420	1	5.05			

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INTER-LABORATORY VALIDATION
OF THE 15-DAY ADULT INTACT MALE RAT
ASSAY WITH LINURON AND PHENOBARBITAL (WA 5-15)

Table 3d: Homogeneity of the 18 October 2005 Phenobarbital Formulations

(Analyzed 18 October 2005)

Ref # (431014 -)	Run #	Theo. (mg/mL)	Area	ln Area	Multi. Factor	Conc. (mg/mL)	Mean (mg/mL)	SD	RSD (%)	RE (%)
Homogeneity										
21 - 1	100	0	------Not Detected------							
21 - 2	101		------Not Detected------							
21 - 3	102	0	------Not Detected------							
21 - 4	103		------Not Detected------							
21 - 5	104	0	------Not Detected------							
21 - 6	105		------Not Detected------							
21 - 7	106	5	123.4	4.815	0.25	5.04	5.25	0.14	2.6	0.86
21 - 8	107		133.4	4.893	0.25	5.45				9.0
21 - 9	108		126.1	4.837	0.25	5.15				3.0
21 - 10	109		129.9	4.867	0.25	5.31				6.2
21 - 11	111		128.7	4.858	0.25	5.26				5.2
21 - 12	112		129.0	4.860	0.25	5.27				5.5
21 - 13	113	10	253.2	5.534	0.25	10.3	10.3	0.15	1.5	3.4
21 - 14	114		246.8	5.508	0.25	10.1				0.72
21 - 15	115		251.7	5.528	0.25	10.3				2.7
21 - 16	116		256.4	5.547	0.25	10.5				4.7
21 - 17	117		251.3	5.527	0.25	10.3				2.6
21 - 18	118		257.0	5.549	0.25	10.5				4.9
21 - 19	119	20	486.5	6.187	0.25	19.9	20.6	0.51	2.5	-0.57
21 - 20	120		508.4	6.231	0.25	20.8				3.9
21 - 21	122		508.5	6.231	0.25	20.8				3.9
21 - 22	123		490.0	6.194	0.25	20.0				0.15
21 - 23	124		509.9	6.234	0.25	20.8				4.2
21 - 24	125		517.8	6.250	0.25	21.2				5.9

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INTER-LABORATORY VALIDATION
OF THE 15-DAY ADULT INTACT MALE RAT
ASSAY WITH LINURON AND PHENOBARBITAL (WA 5-15)

Table 4a: Linuron Calibration Standard Data
(Analyzed 18 October 2005)

Linuron (µg/mL)	Ref # (431014 -)	Run #	Area	Mean	SD	RSD (%)	Response Factor (Mean Area/Conc.)
0.0500	22 - 3	139	26.06	25.85	0.23	0.88	5.17E+02
	22 - 4	140	25.90				
	22 - 5	141	25.61				
0.200	22 - 6	142	104.6	104.7	0.17	0.16	5.23E+02
	22 - 7	143	104.9				
	22 - 8	144	104.6				
1.00	22 - 9	145	498.3	514.1	14	2.7	5.14E+02
	22 - 10	146	521.3				
	22 - 11	147	522.7				
2.50	22 - 12	148	1188	1261	63	5.0	5.04E+02
	22 - 13	149	1298				
	22 - 14	150	1297				
5.00	22 - 15	151	2560	2596	32	1.2	5.19E+02
	22 - 16	152	2606				
	22 - 17	153	2621				

Overall Mean	5.16E+02
SD	7.1E+00
RSD (%)	1.4

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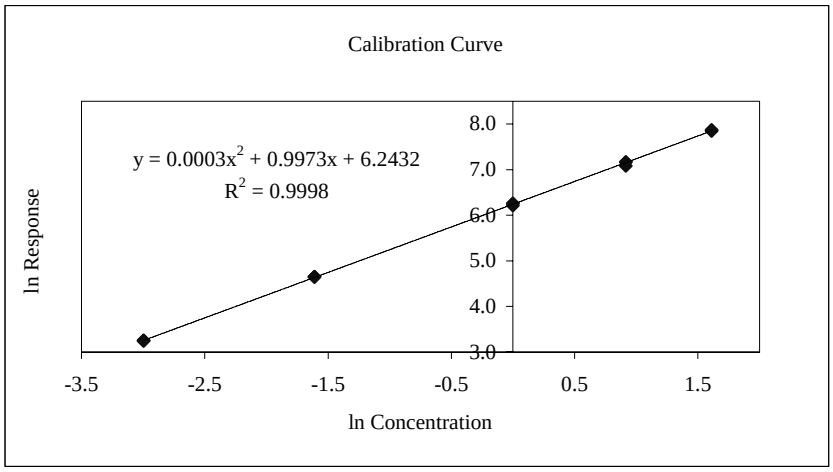
INTER-LABORATORY VALIDATION
OF THE 15-DAY ADULT INTACT MALE RAT
ASSAY WITH LINURON AND PHENOBARBITAL (WA 5-15)

Table 4b: Calibration Curve Data
(Analyzed 18 October 2005)

Ref # (431014 -)	ln Response	ln Conc	ln Conc^2	Back-Calc. Conc. (µg/mL)	RE (%)
22 - 3	3.260	-2.996	8.974	0.0501	0.24
22 - 4	3.254	-2.996	8.974	0.0498	-0.37
22 - 5	3.243	-2.996	8.974	0.0493	-1.5
22 - 6	4.650	-1.609	2.590	0.202	1.2
22 - 7	4.653	-1.609	2.590	0.203	1.4
22 - 8	4.650	-1.609	2.590	0.202	1.1
22 - 9	6.211	0.000	0.000	0.968	-3.2
22 - 10	6.256	0.000	0.000	1.01	1.3
22 - 11	6.259	0.000	0.000	1.02	1.6
22 - 12	7.080	0.916	0.84	2.31	-7.4
22 - 13	7.169	0.916	0.84	2.53	1.2
22 - 14	7.168	0.916	0.84	2.53	1.1
22 - 15	7.848	1.609	2.59	4.99	-0.14
22 - 16	7.866	1.609	2.59	5.08	1.7
22 - 17	7.871	1.609	2.59	5.11	2.3

A	B	C	R^2
0.0003	0.9973	6.243	0.9998



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INTER-LABORATORY VALIDATION
OF THE 15-DAY ADULT INTACT MALE RAT
ASSAY WITH LINURON AND PHENOBARBITAL (WA 5-15)
Table 4c: Calibration Standards, Verification Samples and Method Detection Limit
(Analyzed 18-19 October 2005)

Ref #	Run #	Theo.	Area	ln Area	Conc.	Mean	SD	RSD	RE
(431014 -)		(µg/mL)			(µg/mL)	(µg/mL)		(%)	(%)
Calibration Standards									
22 - 3	139	0.0500	26.06	3.260	0.0501	0.0497	0.00044	0.88	-0.54
22 - 4	140		25.90	3.254	0.0498				
22 - 5	141		25.61	3.243	0.0493				
22 - 6	142	0.200	104.6	4.650	0.202	0.202	0.00033	0.16	1.2
22 - 7	143		104.9	4.653	0.203				
22 - 8	144		104.6	4.650	0.202				
22 - 9	145	1.00	498.3	6.211	0.968	0.999	0.027	2.7	-0.081
22 - 10	146		521.3	6.256	1.01				
22 - 11	147		522.7	6.259	1.02				
22 - 12	148	2.50	1188	7.080	2.31	2.46	0.12	5.0	-1.7
22 - 13	149		1298	7.169	2.53				
22 - 14	150		1297	7.168	2.53				
22 - 15	151	5.00	2560	7.848	4.99	5.06	0.063	1.2	1.3
22 - 16	152		2606	7.866	5.08				
22 - 17	153		2621	7.871	5.11				
Calibration Verification Sample									
22 - 10	156	1.00	518.1	6.250	1.01	1.01	0.0012	0.12	0.60
22 - 10	167		516.9	6.248	1.00				
22 - 10	176		517.7	6.249	1.01				
Initial Calibration Verification									
23 - 2	155	2.50	1535	7.336	2.99				20
29 - 1	181	2.50	1271	7.147	2.47	2.48			-0.97
29 - 1	182		1271	7.147	2.48				
29 - 1	183		1271	7.148	2.48				

The ICV was re-diluted on 10-19-05 (Ref # 431014-29-1) due to possible prep error on 10-18-05 (Ref # 431014-23-2).
The re-diluted ICV was injected 3 times and the average will be used.

Blank									
23 - 4	138	0.00	---Not Detected---						
									MDL
Method Detection Limit (MDL)									(SD * 3.143)
22 - 6	130	0.200	105.0	4.654	1	0.203	0.202	0.00047	0.0015
22 - 6	131		104.8	4.652	1	0.203			
22 - 6	132		104.5	4.649	1	0.202			
22 - 6	133		104.5	4.649	1	0.202			
22 - 6	134		104.5	4.649	1	0.202			
22 - 6	135		104.5	4.649	1	0.202			
22 - 6	136		104.3	4.648	1	0.202			

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INTER-LABORATORY VALIDATION
OF THE 15-DAY ADULT INTACT MALE RAT
ASSAY WITH LINURON AND PHENOBARBITAL (WA 5-15)
Table 4d: Homogeneity of the 18 October 2005 Linuron Formulations
(Analyzed 18 October 2005)

Ref # (431014 -)	Run #	Theo. (mg/mL)	Area	ln Area	Multi. Factor	Conc. (mg/mL)	Mean (mg/mL)	SD	RSD (%)	RE (%)
Homogeneity										
25 - 1	157	10	1309	7.177	4.0	10.2	9.93	0.30	3.0	2.0
25 - 2	158		1241	7.124	4.0	9.67				-3.3
25 - 3	159		1238	7.121	4.0	9.64				-3.6
25 - 4	160		1249	7.130	4.0	9.73				-2.7
25 - 5	161		1278	7.153	4.0	9.96				-0.39
25 - 6	162		1331	7.194	4.0	10.4				3.7
25 - 7	163	20	1207	7.096	8.0	18.8	19.5	0.56	2.9	-6.0
25 - 8	164		1281	7.156	8.0	20.0				-0.16
25 - 9	165		1226	7.112	8.0	19.1				-4.5
25 - 10	166		1257	7.136	8.0	19.6				-2.1
25 - 11	168		1304	7.173	8.0	20.3				1.6
25 - 12	169		1238	7.121	8.0	19.3				-3.5
25 - 13	170	30	1818	7.505	8.0	28.4	28.8	1.1	3.8	-5.5
25 - 14	171		1791	7.491	8.0	27.9				-6.9
25 - 15	172		1947	7.574	8.0	30.4				1.2
25 - 16	173		1822	7.508	8.0	28.4				-5.3
25 - 17	174		1929	7.565	8.0	30.1				0.31
25 - 18	175		1789	7.489	8.0	27.9				-7.0

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INTER-LABORATORY VALIDATION
OF THE 15-DAY ADULT INTACT MALE RAT
ASSAY WITH LINURON AND PHENOBARBITAL (WA 5-15)

Table 5a: Phenobarbital Calibration Standard Data
(Analyzed 31 October 2005)

Phenobarbital (µg/mL)	Ref # (431014 -)	Run #	Area	Response Factor (Mean Area/Conc.)
1.00	45 - 2	194	6.141	6.14E+00
5.00	45 - 3	195	25.11	5.02E+00
25.0	45 - 4	196	151.7	6.07E+00
125	45 - 5	197	724.7	5.80E+00
200	45 - 6	198	1168	5.84E+00

Overall Mean	5.77E+00
SD	4.4E-01
RSD (%)	7.7

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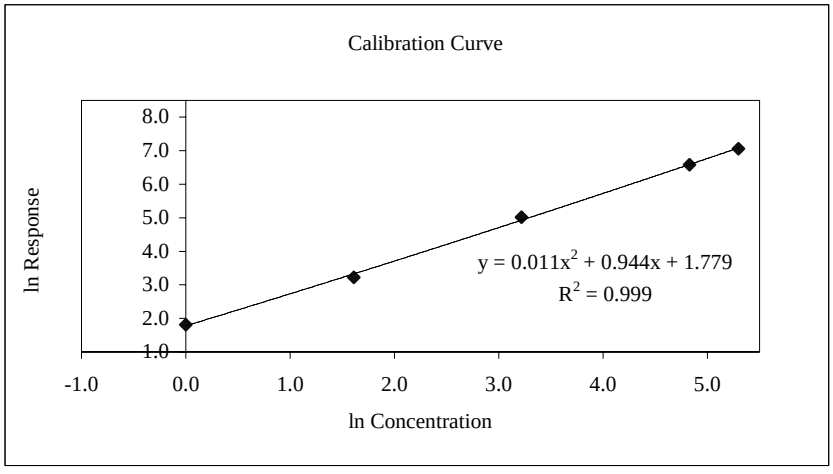
INTER-LABORATORY VALIDATION
OF THE 15-DAY ADULT INTACT MALE RAT
ASSAY WITH LINURON AND PHENOBARBITAL (WA 5-15)
Table 5b: Calibration Curve Data
(Analyzed 31 October 2005)

Ref # (431014 -)	ln Response	ln Conc	ln Conc^2	Back-Calc. Conc. (µg/mL)	RE (%)
45 - 2	1.815	0.000	0.000	1.04	3.9
45 - 3	3.223	1.609	2.590	4.50	-10
45 - 4	5.022	3.219	10.36	27.4	9.5
45 - 5	6.586	4.828	23.31	125	-0.33
45 - 6	7.063	5.298	28.07	196	-2.0

A	B	C	R^2
0.011	0.944	1.779	0.999



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INTER-LABORATORY VALIDATION
OF THE 15-DAY ADULT INTACT MALE RAT
ASSAY WITH LINURON AND PHENOBARBITAL (WA 5-15)
Table 5c: Calibration Standards, Verification Samples, and Method Detection Limit
(Analyzed 31 October 2005)

Ref #	Run #	Theo.	Area	ln Area	Conc.	RE
(431014 -)		(µg/mL)			(µg/mL)	(%)
Calibration Standards						
45 - 2	194	1.00	6.141	1.815	1.04	3.9
45 - 3	195	5.00	25.11	3.223	4.50	-10
45 - 4	196	25.0	151.70	5.022	27.4	9.5
45 - 5	197	125	724.7	6.586	125	-0.33
45 - 6	198	200	1168	7.063	196	-2.0

Ref #	Run #	Theo.	Area	ln Area	Conc.	Mean	SD	RSD	RE
(431014 -)		(µg/mL)			(µg/mL)	(µg/mL)		(%)	(%)
Calibration Verification Sample									
45 - 4	201	25.0	150.7	5.015	27.2	27.2	0.070	0.26	8.9
45 - 4	212		151.2	5.019	27.3				
45 - 4	222		150.5	5.014	27.2				
Initial Calibration Verification									
46 - 2	200	100	585.9	6.373	102				1.7
Blank									
46 - 4	193	0.00	---Not Detected---						

Ref #	Run #	Theo.	Area	ln Area	Multi Factor	Conc.	Mean	SD	
(431014 -)		(µg/mL)				(µg/mL)	(µg/mL)		MDL
Method Detection Limit (MDL)									(SD * 3.143)
45 - 3	185	200	25.48	3.238	1	4.57	4.59	0.018	0.056
45 - 3	186		25.59	3.242	1	4.59			
45 - 3	187		25.67	3.245	1	4.60			
45 - 3	188		25.51	3.239	1	4.57			
45 - 3	189		25.66	3.245	1	4.60			
45 - 3	190		25.68	3.246	1	4.61			
45 - 3	191		25.75	3.248	1	4.62			

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INTER-LABORATORY VALIDATION
OF THE 15-DAY ADULT INTACT MALE RAT
ASSAY WITH LINURON AND PHENOBARBITAL (WA 5-15)
Table 5d: Resuspension Homogeneity and 13-day Refrigerated Stability of the 18 October 2005 Phenobarbital Formulations
(Analyzed 31 October 2005)

Ref # (431014 -)	Run #	Theo. (mg/mL)	Area	ln Area	Multi. Factor	Conc. (mg/mL)	Mean (mg/mL)	SD	RSD (%)	RE (%)
48 - 1	202	0	------Not Detected------							
48 - 2	203		------Not Detected------							
48 - 3	204		------Not Detected------							
48 - 4	205		------Not Detected------							
48 - 5	206	5	122.6	4.809	0.25	5.55	5.54	0.067	1.2	11
48 - 6	207		120.6	4.793	0.25	5.46				9.2
48 - 7	208		124.3	4.823	0.25	5.62				12
48 - 8	209		122.3	4.806	0.25	5.53				11
48 - 9	210	10	238.9	5.476	0.25	10.7	10.7	0.10	0.97	6.8
48 - 10	211		239.7	5.479	0.25	10.7				7.2
48 - 11	213		237.8	5.472	0.25	10.6				6.4
48 - 12	214		243.3	5.494	0.25	10.9				8.8
48 - 13	215	20	472.6	6.158	0.25	20.7	20.9	0.17	0.83	3.4
48 - 14	216		481.0	6.176	0.25	21.0				5.2
48 - 15	217		481.5	6.177	0.25	21.1				5.3
48 - 16	218		479.5	6.173	0.25	21.0				4.9

INTER-LABORATORY VALIDATION
OF THE 15-DAY ADULT INTACT MALE RAT
ASSAY WITH LINURON AND PHENOBARBITAL (WA 5-15)

Table 6a: Linuron Calibration Standard Data
(Analyzed 31 October 2005)

Linuron (µg/mL)	Ref # (431014 -)	Run #	Area	Response Factor (Mean Area/Conc.)
0.0500	49 - 3	235	25.00	5.00E+02
0.200	49 - 4	236	102.8	5.14E+02
1.00	49 - 5	237	498.1	4.98E+02
2.50	49 - 6	238	1273	5.09E+02
5.00	49 - 7	239	2513	5.03E+02

Overall Mean	5.05E+02
SD	6.6E+00
RSD (%)	1.3

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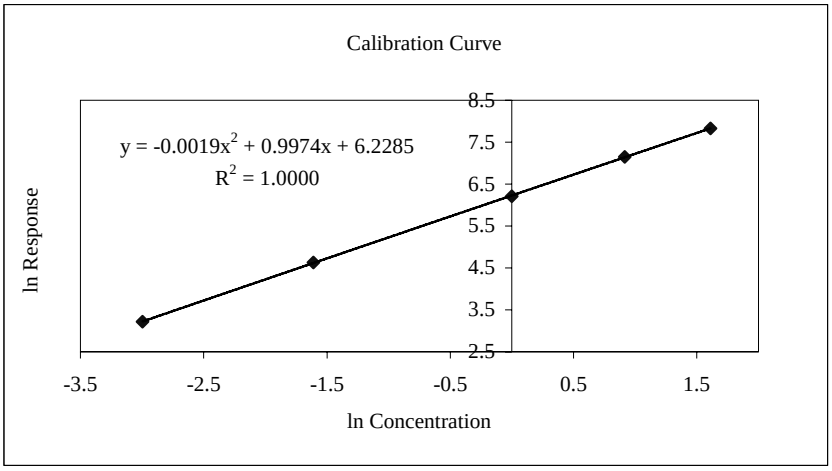
INTER-LABORATORY VALIDATION
OF THE 15-DAY ADULT INTACT MALE RAT
ASSAY WITH LINURON AND PHENOBARBITAL (WA 5-15)
Table 6b: Calibration Curve Data
(Analyzed 31 October 2005)

Ref # (431014 -)	ln Response	ln Conc	ln Conc^2	Back-Calc. Conc. (µg/mL)	RE (%)
49 - 3	3.219	-2.996	8.974	0.0498	-0.48
49 - 4	4.632	-1.609	2.590	0.203	1.4
49 - 5	6.211	0.000	0.000	0.983	-1.7
49 - 6	7.149	0.9163	0.8396	2.52	0.82
49 - 7	7.829	1.609	2.590	5.00	0.029

A	B	C	R^2
-0.0019	0.9974	6.2285	1.0000



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INTER-LABORATORY VALIDATION
OF THE 15-DAY ADULT INTACT MALE RAT
ASSAY WITH LINURON AND PHENOBARBITAL (WA 5-15)
Table 6c: Calibration Standards, Verification Samples and Method Detection Limit
(Analyzed 31 October 2005)

Ref #	Run #	Theo.	Area	ln Area	Conc.	RE
(431014 -)		(µg/mL)			(µg/mL)	(%)
Calibration Standards						
49 - 3	235	0.0500	25.00	3.219	0.0498	-0.48
49 - 4	236	0.200	102.8	4.632	0.203	1.4
49 - 5	237	1.00	498.1	6.211	0.983	-1.7
49 - 6	238	2.50	1273	7.149	2.52	0.82
49 - 7	239	5.00	2513	7.829	5.00	0.029

Ref #	Run #	Theo.	Area	ln Area	Conc.	Mean	SD	RSD	RE
(431014 -)		(µg/mL)			(µg/mL)	(µg/mL)		(%)	(%)
Calibration Verification Sample									
49 - 5	242	1.00	496.1	6.207	0.979	0.982	0.0030	0.31	-1.8
49 - 5	253		499.1	6.213	0.984				
49 - 5	259		498.1	6.211	0.982				
Initial Calibration Verification									
50 - 2	241	2.50	1266	7.144	2.51				0.31
Blank									
50 - 4	234	0.00	---Not Detected---						

Ref #	Run #	Theo.	Area	ln Area	Multi Factor	Conc.	Mean	SD	MDL
(431014 -)		(µg/mL)				(µg/mL)	(µg/mL)		(SD * 3.143)
Method Detection Limit (MDL)									
49 - 4	226	0.200	102.5	4.630	1	0.202	0.202	0.00038	0.0012
49 - 4	227		102.3	4.628	1	0.202			
49 - 4	228		102.2	4.627	1	0.202			
49 - 4	229		102.2	4.627	1	0.202			
49 - 4	230		102.1	4.626	1	0.201			
49 - 4	231		101.9	4.624	1	0.201			
49 - 4	232		102.2	4.627	1	0.202			

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INTER-LABORATORY VALIDATION
OF THE 15-DAY ADULT INTACT MALE RAT
ASSAY WITH LINURON AND PHENOBARBITAL (WA 5-15)
Table 6d: Resuspension Homogeneity and 13-day Refrigerated Stability of the 18 October 2005 Linuron Formulations

(Analyzed 31 October 2005)

Ref #	Run #	Theo.	Area	ln Area	Multi. Factor	Conc.	Mean	SD	RSD	RE
(431014 -)		(mg/mL)				(mg/mL)	(mg/mL)		(%)	(%)
52 - 1	243	10	1250	7.131	4.0	9.90	9.91	0.15	1.5	-0.96
52 - 2	244		1257	7.137	4.0	9.96				-0.41
52 - 3	245		1272	7.148	4.0	10.1				0.74
52 - 4	246		1227	7.112	4.0	9.72				-2.8
52 - 5	247	20	1215	7.102	8.0	19.2	19.4	0.42	2.2	-3.8
52 - 6	248		1263	7.141	8.0	20.0				0.030
52 - 7	249		1215	7.102	8.0	19.2				-3.8
52 - 8	250		1203	7.092	8.0	19.0				-4.8
52 - 9	251	30	1870	7.534	8.0	29.7	30.2	0.64	2.1	-0.97
52 - 10	252		1939	7.570	8.0	30.8				2.7
52 - 11	254		1928	7.564	8.0	30.6				2.1
52 - 12	255		1860	7.528	8.0	29.5				-1.5

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APPENDIX D

Feed Lot And Drinking Water Analyses

FILENAME HT 2366
Received 1 sample on 9/7/05 from Harlan Tekland

1-2018CM-082605MA

Duplicate analysis of each sample
All values are expressed in ug/g
Report completed on 9/13/2005

Sample Name	DIN	GLY	GIN	MDIN	MGLY	AcDIN	AcGLY	MGIN	DEIN	GLEIN	AcGIN	GEIN	Total Dein	Total Gein	Total Glein
1	63	35	82	52	16	17	14	46	9	9	25	11	84	100	48
1A	53	36	57	51	16	16	15	44	8	10	24	10	75	83	51

DIN - diadzin (beta-glycoside of daidzein)
GLY - glycitin (beta-glycoside of glycitein)
GIN - genistin (beta-glycoside of genistein)
MDIN - malonyl glucoside of daidzein
MGLY - malonyl glucoside of glycitein
MGIN - malonyl glucoside of genistein
AcDIN - acetyl glucoside of daidzein
AcGLY - acetyl glucoside of glycitein
AcGIN - acetyl glucoside of genistein
DEIN - aglycone form-daidzein
GEIN - aglycone form of genistein
GLEIN - aglycone form of glycitein

DIVISION OF WATER TREATMENT & SUPPLY
206 Claremont Avenue
Ashland, Ohio 44805
(419) 281-7041

BRUCE D. WISER
Director

January 28, 2005

Dr. Lisa Snyder
Wil Research
1407 Twp Rd 805
Ashland, OH 44805

Re: Water Regulations

Dear Dr. Snyder:

Enclosed you will find a listing of the most recent data on Primary, Secondary Water Regulation and Bacteriological testing for the City of Ashland, Water Treatment Plant.

The following are parameters that we test for each day and guidelines for those parameters:

PARAMETER	AVERAGE	GUIDELINES
pH	9.1	7.0 - 10.5 STATE
Alkalinity Phenol	3	NA
Alkalinity Total	19	20 - 40 OWN
Alkalinity Stability	19	0 - positive no. OWN
Hardness	149	<150 FOR DOMESTIC USE
Phosphate as Total P	2.35	NA
Chlorine Free	1.3	0.5 - 2.0 OWN
Chlorine Combined	0.1	1.0 - 2.0 OWN
Chlorine Free Dist. System	1.0	MIN 0.2 STATE
Fluoride Plant Tap	1.1	0.8 - 2.0 FEDERAL
Fluoride Dist. System	0.95	0.8 - 2.0 FEDERAL

The above parameters are in mg/l except for pH which is in standard units.

If you have any questions or need additional information, please contact our office at 281-7041.

Yours very truly,

Bruce Wiser
Director, Water/Wastewater Treatment Facilities

Enclosures

3745-83-01 Operational Requirements.

(A) Except as otherwise noted, the definitions in rule 3745-81-01 of the Administrative Code shall apply to this chapter.

(B) Disinfection.

(1) For purposes of this rule of the Administrative Code, "major noncommunity public water system" means a noncommunity public water system designated by the director for which he deems it advisable, because of the relatively large number of people who drink or may drink water from the system, that the water be disinfected in the same manner as for a community public water system.

(2) Unless exempted under other provisions of this rule, each community public water system and each major noncommunity public water system shall maintain a minimum chlorine residual of at least two-tenths milligram per liter free chlorine, or one milligram per liter combined chlorine measured at representative points throughout the distribution system. The director may by order require higher residuals as necessary to compensate for pH, temperature, or other characteristics of the delivered water. Chlorine concentrations shall be analyzed in accordance with paragraph (C) of rule 3745-81-27 of the Administrative Code.

(3) A system is exempt from paragraph (B)(2) of this rule if it meets all the following conditions:

(a) The system obtains all its water from a ground water source which has, in the judgment of the director, been properly developed, constructed, and adequately protected; or from a system to which paragraph (B)(2) of this rule applies;

(b) The distribution system serving the water system, in the judgement of the director, has been properly constructed and maintained and is protected by an effective cross-connection program;

(c) The system, in the judgment of the director, has a satisfactory history of bacteriological monitoring indicating no contamination;

(d) The director has certified in writing that conditions of

OhioEPA
Division of Drinking and Ground Waters

Volatile Organic Chemical Sample Submission Report (SSR)

Public Water System Information

PWS: Ashland City Water Treatment Plant PWS ID: 300112
STU: Ashland City STU ID: 352711
206 Claremont Ave
ASHLAND, OH
Ashland
Robert Swinehart
(419) 289-1392

Laboratory Information

Reporting Lab: Aqua Tech Inc
Analytical Lab: Aqua Tech Inc
Reporting lab sample #: 1100535 Repeat for sample #: 0
Sample Received Date: 01/26/2005 QC Completed Date: 02/10/2005
QC Completed by: TMB

Sample Information

Sample Monitoring Point: EP001 Sample Collected Date / Time: 01/26/2005 06:50
Sample Purpose: COMPLIANCE Sample Collected by: CRIS HARDING

Analytical Information

Preservation Location: LABORATORY
Preservation Type:

- [x] ASCORBIC ACID
- [ ] CLCH2COOH
- [ ] FILTERED
- [ ] H2SO4
- [x] HCL
- [ ] HNO3
- [ ] OTHER
- [x] ICED
- [ ] NA2O3S2
- [ ] NAOH
- [ ] NAS
- [ ] NH4CL
- [ ] UNPRESERVED

Remarks:

Analysis Results - VOC

Parameters	Sign	Results	Units	Date	Method	Analyst Number
Bromodichloromethane	+	5.40000	ug/l	02/05/2005	EPA 524.2	135
Bromoform	+	2.70000	ug/l	02/05/2005	EPA 524.2	135
Chloroform	+	3.20000	ug/l	02/05/2005	EPA 524.2	135
Dibromochloromethane	+	6.00000	ug/l	02/05/2005	EPA 524.2	135
Acetone						
nzene	<	0.50000	ug/l	02/05/2004	EPA 524.2	135
promobenzene						
Bromochloromethane						
Bromomethane						
n-Butylbenzene						

PA 5019 (Rev 1/99) Page 1 of 3 02/10/2005

OhioEPA
Division of Drinking and Ground Waters

Volatile Organic Chemical
Sample Submission Report (SSR)

Analysis Results - VOC

Parameters	Sign	Results	Units	Date	Method	Analyst Number
sec-Butylbenzene						
tert-Butylbenzene						
Carbon tetrachloride	+	0.60000	ug/l	02/05/2005	EPA 524.2	135
Chlorobenzene	<	0.50000	ug/l	02/05/2005	EPA 524.2	135
Chloroethane						
Chloromethane						
2-Chlorotoluene						
4-Chlorotoluene						
Dibromomethane						
1,2-Dichlorobenzene	<	0.50000	ug/l	02/05/2005	EPA 524.2	135
1,3-Dichlorobenzene						
1,4-Dichlorobenzene	<	0.50000	ug/l	02/05/2005	EPA 524.2	135
Dichlorodifluoromethane						
1,1-Dichloroethane						
1,2-Dichloroethane	<	0.50000	ug/l	02/05/2005	EPA 524.2	135
1,1-Dichloroethene	<	0.50000	ug/l	02/05/2005	EPA 524.2	135
s-1,2-Dichloroethene	<	0.50000	ug/l	02/05/2005	EPA 524.2	135
trans-1,2-Dichloroethene	<	0.50000	ug/l	02/05/2005	EPA 524.2	135
Dichloromethane	<	0.50000	ug/l	02/05/2005	EPA 524.2	135
1,2-Dichloropropane	<	0.50000	ug/l	02/05/2005	EPA 524.2	135
1,3-Dichloropropane						
2,2-Dichloropropane						
1,1-Dichloropropene						
1,3-Dichloropropene						
Ethylbenzene	<	0.50000	ug/l	02/05/2005	EPA 524.2	135
Hexachlorobutadiene						
Isopropylbenzene						
4-Isopropyltoluene						
Methyl-t-butyl ether						
Naphthalene						
Nitrobenzene						
n-Propylbenzene						
Styrene	<	0.50000	ug/l	02/05/2005	EPA 524.2	135
1,1,1,2-Tetrachloroethane						
1,1,2,2-Tetrachloroethane						
Toluene	<	0.50000	ug/l	02/05/2005	EPA 524.2	135
1,1,1-Trichloroethane	<	0.50000	ug/l	02/05/2005	EPA 524.2	135
trachloroethene	<	0.50000	ug/l	02/05/2005	EPA 524.2	135
1,2,3-Trichlorobenzene						
1,2,4-Trichlorobenzene	<	0.50000	ug/l	02/05/2005	EPA 524.2	135
Trichloroethene	<	0.50000	ug/l	02/05/2005	EPA 524.2	135

OhioEPA
Division of Drinking and Ground Waters

Volatile Organic Chemical Sample Submission Report (SSR)

Analysis Results - VOC

Parameters	Sign	Results	Units	Date	Method	Analyst Number
1,1,2-Trichloroethane	<	0.50000	ug/l	02/05/2005	EPA 524.2	135
Trichlorofluoromethane						
1,2,3-Trichloropropane						
1,2,4-Trimethylbenzene						
1,3,5-Trimethylbenzene						
Vinyl chloride	<	0.50000	ug/l	02/05/2005	EPA 524.2	135
Xylenes, total	<	1.50000	ug/l	02/05/2005	EPA 524.2	135
m-Xylene						
o-Xylene						
p-Xylene						

(SOC)

OhioEPA
Division of Drinking and Ground Waters

Pesticides and Other Chemicals
Sample Submission Report (SSR)

Public Water System Information

PWS: Ashland City Water Treatment Plant PWS ID: 300112
STU: Ashland City STU ID: 352711
206 Claremont Ave
ASHLAND, OH
Ashland
Robert Swinehart
(419) 289-1392

Laboratory Information

Reporting Lab: Aqua Tech Inc
Analytical Lab: Aqua Tech Inc
Reporting lab sample #: 2200535 Repeat for sample #: 0
Sample Received Date: 01/26/2005 QC Completed Date: 02/10/2005
QC Completed by: TMB

Sample Information

Sample Monitoring Point: EP001 Sample Collected Date / Time: 01/26/2005 06:25
Sample Purpose: COMPLIANCE Sample Collected by: CRIS HARDING

Analytical Information

Preservation Location: LABORATORY
Preservation Type:

- [ ] ASCORBIC ACID
- [ ] CLCH2COOH
- [ ] FILTERED
- [ ] H2SO4
- [ ] HCL
- [ ] HNO3
- [ ] OTHER
- [x] ICED
- [x] NA2O3S2
- [ ] NAOH
- [ ] NAS
- [ ] NH4CL
- [ ] UNPRESERVED

Remarks:

Analysis Results - PESTICIDES AND OTHER ORGANIC CHEMICALS ug/l

Parameters	Sign	Results	Units	Date	Method	Analyst Number
Alachlor	<	0.20000	ug/l	02/08/2005	EPA 507	3224
Atrazine	<	0.30000	ug/l	02/08/2005	EPA 507	3224
Simazine	<	0.40000	ug/l	02/08/2005	EPA 507	3224
Metolachlor						
Metribuzin						
etochlor						
Acrolein						
Acrylamide						
Acrylonitrile						
Alachlor esa						

OhioEPA
Division of Drinking and Ground Waters

Pesticides and Other Chemicals

Sample Submission Report (SSR)

Analysis Results - PESTICIDES AND OTHER ORGANIC CHEMICALS ug/l

Parameters	Sign	Results	Units	Date	Method	Analyst Number
Aldicarb						
Aldicarb Sulfone						
Aldicarb Sulfoxide						
Aldrin						
Aroclor 1016						
Aroclor 1221						
Aroclor 1232						
Aroclor 1242						
Aroclor 1248						
Aroclor 1254						
Aroclor 1260						
Atrazine-desethyl						
Benzo(a)pyrene						
Butachlor						
Carbaryl						
Carbofuran						
ılordane						
Cyanazine						
Dalapon						
DCPA di- acid degradate						
DCPA mono acid degradate						
DDE						
Decachlorobiphenyl, total						
Diazinon						
1,2-Dibromo-3-chloropropane						
1,2-Dibromoethane						
Dicamba						
2,4-Dichlorophenol						
2,4-Dichlorophenoxyacetic acid						
Dieldrin						
Di(2-ethylhexyl)adipate						
Di(2-ethylhexyl)phthalate						
Dimethoate						
2,4-Dinitrophenol						
2,4-Dinitrotoluene						
2,6-Dinitrotoluene						
Dinoseb						
1,2-Diphenylhydrazine						
2,6-Di-tert-butyl-p-benzoquinone						
Diquat						
Disulfoton						

OhioEPA
Division of Drinking and Ground Waters

Pesticides and Other Chemicals
Sample Submission Report (SSR)

Analysis Results - PESTICIDES AND OTHER ORGANIC CHEMICALS ug/l

Parameters	Sign	Results	Units	Date	Method	Analyst Number
Diuron						
EPTC						
Endothall						
Endrin						
Epichlorohydrin						
Fonofos						
Glyphosate						
Heptachlor						
Heptachlor epoxide						
Hexachlorobenzene						
Hexachlorocyclopentadiene						
3-Hydroxycarbofuran						
Lindane						
Linuron						
Methomyl						
Methoxychlor						
Methylphenol						
Molinate						
Organotins						
Oxamyl						
Pentachlorophenol						
Perchlorate						
Phenol, total						
Picloram						
Polychlorinated biphenyls						
Prometon						
Propachlor						
RDX						
Rhodamine WT						
2,3,7,8-Tetrachlorodibenzo-p-dioxin						
Terbacil						
Terbufos						
2,4,6-Trichlorophenol						
2,4,5-Trichlorophenoxypropionic acid						
Toxaphene						
Trifluralin						

OhioEPA
Division of Drinking and Ground Waters

Inorganic Chemical
Sample Submission Report (SSR)

Public Water System Information

PWS: Ashland City Water Treatment Plant — PWS ID: 300112
STU: Ashland City — STU ID: 352711
206 Claremont Ave
ASHLAND, OH
Ashland
Robert Swinehart
(999) 999-9999

Laboratory Information

Reporting Lab: Aqua Tech Marion Laboratory
Analytical Lab: Aqua Tech Marion Laboratory
Reporting lab sample #: 501262 — Repeat for sample #: 0
Sample Received Date: 01/26/2005 — QC Completed Date: 02/03/2005
QC Completed by: DEB JOHNSON

Sample Information

Sample Monitoring Point: EP001 — Sample Collected Date / Time: 01/26/2005 06:20
Sample Purpose: COMPLIANCE — Sample Collected by: CHRIS HARDING

Analytical Information

Preservation Location: FIELD

Preservation Type:

✓ ASCORBIC ACID	✓ ICED
✓ CLCH2COOH	NA2O3S2
FILTERED	✓ NAOH
✓ H2SO4	NAS
HCL	NH4CL
✓ HNO3	UNPRESERVED
OTHER	

Remarks:

Analysis Results - Inorganic Chemicals

Parameters	Sign	Results	Units	Date	Method	Analyst Number
Aluminum, total						
Antimony, total	<	3.00000	ug/l	01/27/2005	EPA 200.8	128
Arsenic, total	<	3.00000	ug/l	01/27/2005	EPA 200.8	128
Asbestos, >10um						
Barium, total	+	32.00000	ug/l	01/27/2005	EPA 200.8	128
Beryllium, total	<	0.50000	ug/l	01/27/2005	EPA 200.8	128
ismuth						
Boron, total						
Cadmium, total	<	0.50000	ug/l	01/27/2005	EPA 200.8	128
Calcium, total						

OhioEPA
Division of Drinking and Ground Waters

Inorganic Chemical
Sample Submission Report (SSR)

Analysis Results - Inorganic Chemicals

Parameters	Sign	Results	Units	Date	Method	Analyst Number
Chloride, total						
Chromium, hexavalent						
Chromium, total	<	10.00000	ug/l	01/27/2005	EPA 200.8	128
Cobalt, total						
Copper, total						
Cyanide, free						
Cyanide, total	<	5.00000	ug/l	01/28/2005	EPA 335.4	118
Fluoride, total	+	1.03000	mg/l	01/27/2005	SM 4500-F-C	125
Iron, total						
Iron, dissolved						
Lead, total						
Lithium, total						
Manganese, total						
Magnesium, total						
Mercury, total	<	0.20000	ug/l	02/02/2005	EPA 245.2	132
Molybdenum, total						
Nickel, total	<	10.00000	ug/l	01/27/2005	EPA 200.8	128
trogen Ammonia						
Nitrate	<	0.10000	mg/l	01/27/2005	EPA 353.2	121
Nitrate-Nitrite	<	0.10000	mg/l	01/27/2005	EPA 353.2	121
Nitrite	<	0.10000	mg/l	01/27/2005	EPA 353.2	121
Potassium, total						
Selenium, total	<	3.00000	ug/l	01/27/2005	EPA 353.2	121
Silica, dissolved						
Silver, total						
Sodium, total						
Strontium, total						
Sulfate, total						
Thallium, total	<	1.00000	ug/l	01/27/2000	EPA 200.8	128
Tin, total						
Titanium, total						
Vanadium, total						
Zinc, total						
Acidity, methylorange						
Acidity, total						
Alkalinity, phenolphthalein						
Alkalinity, stability						
Alkalinity, total						
ological Oxygen Demand						
Chemical Oxygen Demand						
Color						

OhioEPA
Division of Drinking and Ground Waters

Inorganic Chemical
Sample Submission Report (SSR)

Analysis Results - Inorganic Chemicals

Parameters	Sign	Results	Units	Date	Method	Analyst Number
Conductivity at 25c						
Dissolved Solids, total						
Hardness, total						
MBAS						
Nitrogen TKN						
Oil-Grease, total						
Orthophosphate						
Phenol						
Phosphate, reactive						
Phosphate, total						
Phosphorus, soluble						
Phosphorus, total						
Residue, settled						
Residue, total						
Residue, total filtered						
Residue, total non-filtered						
Residue, total volatile						
Residue, volatile filtered						
Residue, volatile non-filtered						
Total Oxygen Demand						
Turbidity						
pH, lab						
pH, stability						

ATEL

Aqua Tech Environmental Laboratories, Inc.

- CERTIFICATE OF ANALYSIS -

Client #: I0043
Wil Research Laboratories
1407 George Road
Ashland, OH 44805

Attn: Lisa Snyder DVM

Report Date: *15-Jun-05*

Phone: (419) 289-8700 **Ext:**
FAX: (419) 289-3650

Our Lab #: MAR05-08332
Date Logged-In: 6/3/05
Sample Type: Water
Project #:

Your Sample ID: Incoming City
Sample Source: SDWA/WTP's
Client Project #: 2005 Annual
Date Submitted to Lab: 6/3/2005

PO#: 24977

- COLLECTION INFORMATION -

Date/Time/By: 6/2/05 12:40 PM J.T. Simpson

EPA Method	Analyst	Analysis Date	Parameter	Result	Units	PQL
200.8	ROH	6/6/05	Arsenic, As	< 3.0	µg/L	3.0
200.8	ROH	6/6/05	Barium, Ba	38	µg/L	10
200.8	ROH	6/6/05	Cadmium, Cd	< 0.5	µg/L	0.5
200.7	RJA	6/8/05	Chromium, Cr	< 20	µg/L	20
200.7	RJA	6/8/05	Copper, Cu	< 10	µg/L	10
SM 4500F-C	LGE	6/7/05	Fluoride, F, Dissolved	0.84	mg/L	0.10
200.8	ROH	6/6/05	Lead, Pb	< 2.0	µg/L	2.0
245.2	RJA	6/8/05	Mercury, Hg	< 0.2	µg/L	0.2
200.8	ROH	6/6/05	Nickel, Ni	< 10	µg/L	10
SM4500-NO3-F	TLL	6/7/05	Nitrogen, Nitrate + Nitrite (as N)	0.08	mg/L	0.05
200.8	ROH	6/6/05	Selenium, Se	< 3.0	µg/L	3.0
200.7	RJA	6/8/05	Silver, Ag	< 20	µg/L	20
200.7	RJA	6/8/05	Sodium, Na	29	mg/L	0.4
200.7	RJA	6/8/05	Zinc, Zn	< 10	µg/L	10

End of Report

Report Approved By: Deborah K. Johnson

Deborah K. Johnson

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Aqua Tech Environmental Laboratories, Inc.

- CERTIFICATE OF ANALYSIS -

Client #: I0043 **Report Date:** *15-Jun-05*

Wil Research Laboratories

1407 George Road

Ashland, OH 44805 **Phone:** (419) 289-8700 **Ext:**

FAX: (419) 289-3650

Attn: Lisa Snyder DVM

Our Lab#: MAR05-08341 **Your Sample ID:** Incoming City

Date Logged In: 6/3/05 **Sample Source:** SDWA/WTP's

Sample Type: Water **Client Project #:** 2005 Annual

Project #: **Date Submitted to Lab:** 6/3/2005 **PO#:** 24977

- COLLECTION INFORMATION -

Date/Time/By: 6/2/05 12:40 PM J.T. Simpson

EPA Method	Analyst	Prep Date	Analysis Date
524.2	SLC		6/10/05

CAS Number	Parameter	Result	PQL
71-43-2	Benzene	< 0.5 ug/l	0.5
75-25-2	Bromoform	< 0.5 ug/l	0.5
75-27-4	Bromodichloromethane	3.2 ug/l	0.5
56-23-5	Carbon tetrachloride	< 0.5 ug/l	0.5
108-90-7	Chlorobenzene	< 0.5 ug/l	0.5
67-66-3	Chloroform	4.7 ug/l	0.5
124-48-1	Dibromochloromethane	0.8 ug/l	0.5
95-50-1	1,2-Dichlorobenzene	< 0.5 ug/l	0.5
106-46-7	1,4-Dichlorobenzene	< 0.5 ug/l	0.5
107-06-2	1,2-Dichloroethane	< 0.5 ug/l	0.5
75-35-4	1,1-Dichloroethene	< 0.5 ug/l	0.5
156-59-2	cis-1,2-Dichloroethene	< 0.5 ug/l	0.5
156-60-5	trans-1,2-Dichloroethene	< 0.5 ug/l	0.5
78-87-5	1,2-Dichloropropane	< 0.5 ug/l	0.5
100-41-4	Ethylbenzene	< 0.5 ug/l	0.5
75-09-2	Methylene chloride	< 0.5 ug/l	0.5
100-42-5	Styrene	< 0.5 ug/l	0.5
127-18-4	Tetrachloroethene	< 0.5 ug/l	0.5
108-88-3	Toluene	< 0.5 ug/l	0.5
71-55-6	1,1,1-Trichloroethane	< 0.5 ug/l	0.5
79-00-5	1,1,2-Trichloroethane	< 0.5 ug/l	0.5

Your Sample ID: Incoming City *Lab Number MAR05-08341*

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Aqua Tech Environmental Laboratories, Inc.

- CERTIFICATE OF ANALYSIS -

CAS Number	Parameter	Result	Typical Report Limit
79-01-6	Trichloroethene	< 0.5 ug/l	0.5
95-47-6	o-Xylene	< 0.5 ug/l	0.5
120-82-1	1,2,4-Trichlorobenzene	< 0.5 ug/l	0.5
75-01-4	Vinyl chloride	< 0.5 ug/l	0.5
108383/106	m&p Xylenes	< 1.0 ug/l	1
	Xylene, Total	< 1.5 ug/l	1.5

--- Surrogate Recoveries ---

QC Lab#	EPA Method	Surrogate Name	Percent Recovery	Lower Limit	Upper Limit
MAR05-08341	524.2	1,2-Dichlorobenzene-d4 (Surr)	117 %R	70	130
MAR05-08341	524.2	Bromofluorobenzene (BFB) (Surr)	107 %R	70	130

End of Report

Report Approved By: MICHAEL HERDLICK

Your Sample ID: Incoming City

Lab Number MAR05-08341

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Aqua Tech Environmental Laboratories, Inc.

- CERTIFICATE OF ANALYSIS -

Client #: I0043
Wil Research Laboratories
1407 Montgomery Twp #805
Ashland, OH 44805
Attn: Lisa Snyder

Report Date: *20-Jun-05*
Total Number of Pages: 2

Phone: (419) 289-8700 **Ext:**
FAX: (419) 289-3650

Our Lab#: MEL05-02885 **Your Sample ID:** Incoming City
Date Logged In: 6/3/05 **Sample Source:** Drinking Water
Sample Type: Water **Client Project #:**
Project #: **Date Submitted to Lab:** 6/3/2005 **PO#:** 24977

- COLLECTION INFORMATION -

Date/Time/By: 6/2/2005 12:40 PM Joe Tate Simpson

EPA Method	Analyst	Prep Date	Analysis Date
507	TMH	6/6/2005	6/9/2005

CAS Number	Parameter	Result	Report Limit
15972-60-8	Alachlor	< 0.20 ug/l	0.20
1912-24-9	Atrazine	< 0.30 ug/l	0.30
51218-45-2	Metolachlor	< 5.0 ug/l	5.0
21087-64-9	Metribuzin	< 2.0 ug/l	2.0
122-34-9	Simazine	< 0.40 ug/l	0.40

EPA Method	Analyst	Prep Date	Analysis Date
508	RDK	6/6/2005	6/9/2005

CAS Number	Parameter	Result	Report Limit
309-00-2	Aldrin	< 30 ug/l	30
58-89-9	gamma-BHC (Lindane)	< 0.02 ug/l	0.02
57-74-9	Chlordane(Total)	< 0.20 ug/l	0.20
60-57-1	Dieldrin	< 20 ug/l	20
72-20-8	Endrin	< 0.20 ug/l	0.20
76-44-8	Heptachlor	< 0.04 ug/l	0.04
1024-57-3	Heptachlor epoxide	< 0.02 ug/l	0.02
118-74-1	Hexachlorobenzene	< 0.10 ug/l	0.10
77-47-4	Hexachlorocyclopentadiene	< 5.0 ug/l	5.0
72-43-5	Methoxychlor	< 4.0 ug/l	4.0
	Total PCB	< 0.50 ug/l	0.50
8001-35-2	Toxaphene	< 1.0 ug/l	1.0

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Aqua Tech Environmental Laboratories, Inc.

- CERTIFICATE OF ANALYSIS -

EPA Method	Analyst	Prep Date	Analysis Date
515.1	AFK	6/7/2005	6/11/2005

CAS Number	Parameter	Result	Report Limit
75-99-0	Dalapon	< 20 ug/l	20
1918-00-9	Dicamba	< 10 ug/l	10
94-75-7	2,4-Dichlorophenoxyacetic acid (2,4-D)	< 7.0 ug/l	7.0
88-85-7	Dinoseb	< 0.70 ug/l	0.70
87-86-5	Pentachlorophenol	< 0.10 ug/l	0.10
1918-02-1	Picloram	< 50 ug/l	50
93-72-1	Silvex	< 5.0 ug/l	5.0

EPA Method	Analyst	Prep Date	Analysis Date
531.1	TAG		6/10/2005

CAS Number	Parameter	Result	Report Limit
	CCV recovery for oxamyl was above method acceptance limits. LFB recoveries for propoxur and methiocarb were above method acceptance limits. The target analytes were not detected in sample.		
116-06-3	Aldicarb	< 0.7 ug/l	0.7
1646-88-4	Aldicarb sulfone	< 0.7 ug/l	0.7
1646-87-3	Aldicarb sulfoxide	< 0.7 ug/l	0.7
63-25-2	Carbaryl	< 10 ug/l	10
1563-66-2	Carbofuran	< 4.0 ug/l	4.0
16655-82-6	3-Hydroxycarbofuran	< 10 ug/l	10
16752-77-5	Methomyl	< 50 ug/l	50
23135-22-0	Oxamyl	< 20 ug/l	20

--- Surrogate Recoveries ---

QC Lab#	EPA Method	Surrogate Name	Percent Recovery	Lower Limit	Upper Limit
MEL05-02885	507	DMNB (Surr)	89 %R	70	130
MEL05-02885	508	Decachlorobiphenyl (Surr)	112 %R	70	130
MEL05-02885	515.1	DCAA (Surr)	122 %R	70	130

End of Report

Report Approved By: Todd M. Brown

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LTS 6/24/10

ATEL

Aqua Tech Environmental Laboratories, Inc.

- CERTIFICATE OF ANALYSIS -

Client #: I0043
Wil Research Laboratories
1407 George Road
Ashland, OH 44805

Attn: Lisa Snyder DVM

Report Date: *15-Jun-05*

Phone: (419) 289-8700 **Ext:**
FAX: (419) 289-3650

Our Lab #: MAR05-08328
Date Logged-In: 6/3/05
Sample Type: Water
Project #:

Your Sample ID: Prior to RO-N
Sample Source: Other/Undefined
Client Project #: 2005 Annual
Date Submitted to Lab: 6/3/2005 **PO#:** 24977

- COLLECTION INFORMATION -

Date/Time/By: 6/2/05 8:24 AM J.T. Simpson

EPA Method	Analyst	Analysis Date	Parameter	Result	Units	PQL
200.8	ROH	6/6/05	Arsenic, As	< 3.0	µg/L	3.0
200.8	ROH	6/6/05	Barium, Ba	< 10	µg/L	10
200.8	ROH	6/6/05	Cadmium, Cd	< 0.5	µg/L	0.5
200.7	RJA	6/8/05	Chromium, Cr	< 20	µg/L	20
200.7	RJA	6/8/05	Copper, Cu	< 10	µg/L	10
SM 4500F-C	LGE	6/7/05	Fluoride, F, Dissolved	0.85	mg/L	0.10
200.8	ROH	6/6/05	Lead, Pb	< 2.0	µg/L	2.0
245.2	RJA	6/8/05	Mercury, Hg	< 0.2	µg/L	0.2
200.8	ROH	6/6/05	Nickel, Ni	< 10	µg/L	10
SM4500-NO3-F	TLL	6/7/05	Nitrogen, Nitrate + Nitrite (as N)	0.06	mg/L	0.05
200.8	ROH	6/6/05	Selenium, Se	< 3.0	µg/L	3.0
200.7	RJA	6/8/05	Silver, Ag	< 20	µg/L	20
200.7	RJA	6/8/05	Sodium, Na	95	mg/L	0.4
200.7	RJA	6/8/05	Zinc, Zn	< 10	µg/L	10

End of Report

Report Approved By: Deborah K. Johnson

Deborah K. Johnson

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PHONE 740-389-5991 • 1-800-873-2835 • FAX 740-389-1481

Reviewed and OK
J.T.S 6/24/05

ATEL

Aqua Tech Environmental Laboratories, Inc.

- CERTIFICATE OF ANALYSIS -

Client #: I0043

Wil Research Laboratories

1407 George Road

Ashland, OH 44805

Attn: Lisa Snyder DVM

Report Date: *15-Jun-05*

Phone: (419) 289-8700 **Ext:**

FAX: (419) 289-3650

Our Lab#: MAR05-08337 **Your Sample ID:** Prior to RO-N

Date Logged In: 6/3/05 **Sample Source:** Other/Undefined

Sample Type: Water **Client Project #:** 2005 Annual

Project #: **Date Submitted to Lab:** 6/3/2005 **PO#:** 24977

- COLLECTION INFORMATION -

Date/Time/By: 6/2/05 8:24 AM J.T. Simpson

EPA Method	Analyst	Prep Date	Analysis Date
524.2	SLC		6/10/05

CAS Number	Parameter	Result	PQL
71-43-2	Benzene	< 0.5 ug/l	0.5
75-25-2	Bromoform	< 0.5 ug/l	0.5
75-27-4	Bromodichloromethane	< 0.5 ug/l	0.5
56-23-5	Carbon tetrachloride	< 0.5 ug/l	0.5
108-90-7	Chlorobenzene	< 0.5 ug/l	0.5
67-66-3	Chloroform	< 0.5 ug/l	0.5
124-48-1	Dibromochloromethane	< 0.5 ug/l	0.5
95-50-1	1,2-Dichlorobenzene	< 0.5 ug/l	0.5
106-46-7	1,4-Dichlorobenzene	< 0.5 ug/l	0.5
107-06-2	1,2-Dichloroethane	< 0.5 ug/l	0.5
75-35-4	1,1-Dichloroethene	< 0.5 ug/l	0.5
156-59-2	cis-1,2-Dichloroethene	< 0.5 ug/l	0.5
156-60-5	trans-1,2-Dichloroethene	< 0.5 ug/l	0.5
78-87-5	1,2-Dichloropropane	< 0.5 ug/l	0.5
100-41-4	Ethylbenzene	< 0.5 ug/l	0.5
75-09-2	Methylene chloride	< 0.5 ug/l	0.5
100-42-5	Styrene	< 0.5 ug/l	0.5
127-18-4	Tetrachloroethene	< 0.5 ug/l	0.5
108-88-3	Toluene	< 0.5 ug/l	0.5
71-55-6	1,1,1-Trichloroethane	< 0.5 ug/l	0.5
79-00-5	1,1,2-Trichloroethane	< 0.5 ug/l	0.5

Your Sample ID: Prior to RO-N *Lab Number MAR05-08337*

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Reviewed and OK
ITS 6/24/05

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Aqua Tech Environmental Laboratories, Inc.

- CERTIFICATE OF ANALYSIS -

CAS Number	Parameter	Result	Typical Report Limit
79-01-6	Trichloroethene	< 0.5 ug/l	0.5
95-47-6	o-Xylene	< 0.5 ug/l	0.5
120-82-1	1,2,4-Trichlorobenzene	< 0.5 ug/l	0.5
75-01-4	Vinyl chloride	< 0.5 ug/l	0.5
108383/106	m&p Xylenes	< 1.0 ug/l	1
	Xylene, Total	< 1.5 ug/l	1.5

--- Surrogate Recoveries ---

QC Lab#	EPA Method	Surrogate Name	Percent Recovery	Lower Limit	Upper Limit
MAR05-08337	524.2	1,2-Dichlorobenzene-d4 (Surr)	106 %R	70	130
MAR05-08337	524.2	Bromofluorobenzene (BFB) (Surr)	102 %R	70	130

End of Report

Report Approved By: Michael Herold

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Your Sample ID: Prior to RO-N

Lab Number MAR05-08337

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reviewed and OK LTS 6/24/05

ATEL

Aqua Tech Environmental Laboratories, Inc.

- CERTIFICATE OF ANALYSIS -

Client #: I0043
Wil Research Laboratories
1407 Montgomery Twp #805
Ashland, OH 44805
Attn: Lisa Snyder

Report Date: 20-Jun-05
Total Number of Pages: 2

Phone: (419) 289-8700 **Ext:**
FAX: (419) 289-3650

Our Lab#: MEL05-02881 **Your Sample ID:** Prior to RO-N
Date Logged In: 6/3/05 **Sample Source:** Drinking Water
Sample Type: Water **Client Project #:**
Project #: **Date Submitted to Lab:** 6/3/2005 **PO#:** 24977

- COLLECTION INFORMATION -

Date/Time/By: 6/2/2005 8:24 AM Joe Tate Simpson

PA Method	Analyst	Prep Date	Analysis Date
507	TMH	6/6/2005	6/9/2005

CAS Number	Parameter	Result	Report Limit
Low surrogate revovery due to matrix effect, results confirmed by MS sample.			
15972-60-8	Alachlor	< 0.20 ug/l	0.20
1912-24-9	Atrazine	< 0.30 ug/l	0.30
51218-45-2	Metolachlor	< 5.0 ug/l	5.0
21087-64-9	Metribuzin	< 2.0 ug/l	2.0
122-34-9	Simazine	< 0.40 ug/l	0.40

PA Method	Analyst	Prep Date	Analysis Date
508	RDK	6/6/2005	6/9/2005

CAS Number	Parameter	Result	Report Limit
309-00-2	Aldrin	< 30 ug/l	30
58-89-9	gamma-BHC (Lindane)	< 0.02 ug/l	0.02
57-74-9	Chlordane(Total)	< 0.20 ug/l	0.20
60-57-1	Dieldrin	< 20 ug/l	20
72-20-8	Endrin	< 0.20 ug/l	0.20
76-44-8	Heptachlor	< 0.04 ug/l	0.04
1024-57-3	Heptachlor epoxide	< 0.02 ug/l	0.02
118-74-1	Hexachlorobenzene	< 0.10 ug/l	0.10
77-47-4	Hexachlorocyclopentadiene	< 5.0 ug/l	5.0
72-43-5	Methoxychlor	< 4.0 ug/l	4.0
	Total PCB	< 0.50 ug/l	0.50
8001-35-2	Toxaphene	< 1.0 ug/l	1.0

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EPA Method	Analyst	Prep Date	Analysis Date
515.1	AFK	6/7/2005	6/11/2005

CAS Number	Parameter	Result	Report Limit
75-99-0	Dalapon	< 20 ug/l	20
1918-00-9	Dicamba	< 10 ug/l	10
94-75-7	2,4-Dichlorophenoxyacetic acid (2,4-D)	< 7.0 ug/l	7.0
88-85-7	Dinoseb	< 0.70 ug/l	0.70
87-86-5	Pentachlorophenol	< 0.10 ug/l	0.10
1918-02-1	Picloram	< 50 ug/l	50
93-72-1	Silvex	< 5.0 ug/l	5.0

EPA Method	Analyst	Prep Date	Analysis Date
531.1	TAG		6/10/2005

CAS Number	Parameter	Result	Report Limit
LFB recoveries for oxamyl and sulfone were above method acceptance limits. The target analytes were not detected in sample.			
116-06-3	Aldicarb	< 0.7 ug/l	0.7
1646-88-4	Aldicarb sulfone	< 0.7 ug/l	0.7
1646-87-3	Aldicarb sulfoxide	< 0.7 ug/l	0.7
63-25-2	Carbaryl	< 10 ug/l	10
1563-66-2	Carbofuran	< 4.0 ug/l	4.0
16655-82-6	3-Hydroxycarbofuran	< 10 ug/l	10
16752-77-5	Methomyl	< 50 ug/l	50
23135-22-0	Oxamyl	< 20 ug/l	20

--- Surrogate Recoveries ---

QC Lab#	EPA Method	Surrogate Name	Percent Recovery	Lower Limit	Upper Limit
MEL05-02881	507	DMNB (Surr)	67 %R *	70	130
MEL05-02881	508	Decachlorobiphenyl (Surr)	74 %R	70	130
MEL05-02881	515.1	DCAA (Surr)	134 %R *	70	130

Surrogate Recovery high but no target analyte detected

End of Report

Report Approved By: Todd M. Brown

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ATEL

Aqua Tech Environmental Laboratories, Inc.

- CERTIFICATE OF ANALYSIS -

Client #: I0043
Wil Research Laboratories
1407 George Road
Ashland, OH 44805

Report Date: *15-Jun-05*

Phone: (419) 289-8700 **Ext:**
FAX: (419) 289-3650

Attn: Lisa Snyder DVM

Our Lab #: MAR05-08329
Date Logged-In: 6/3/05
Sample Type: Water
Project #:

Your Sample ID: After RO-N
Sample Source: Other/Undefined
Client Project #: 2005 Annual
Date Submitted to Lab: 6/3/2005 **PO#:** 24977

- COLLECTION INFORMATION -

Date/Time/By: 6/2/05 8:36 AM J.T. Simpson

EPA Method	Analyst	Analysis Date	Parameter	Result	Units	PQL
200.8	ROH	6/6/05	Arsenic, As	< 3.0	µg/L	3.0
200.8	ROH	6/6/05	Barium, Ba	< 10	µg/L	10
200.8	ROH	6/6/05	Cadmium, Cd	< 0.5	µg/L	0.5
200.7	RJA	6/8/05	Chromium, Cr	< 20	µg/L	20
200.7	RJA	6/8/05	Copper, Cu	< 10	µg/L	10
SM 4500F-C	LGE	6/7/05	Fluoride, F, Dissolved	< 0.10	mg/L	0.10
200.8	ROH	6/6/05	Lead, Pb	< 2.0	µg/L	2.0
245.2	RJA	6/8/05	Mercury, Hg	< 0.2	µg/L	0.2
200.8	ROH	6/6/05	Nickel, Ni	< 10	µg/L	10
SM4500-NO3-F	TLL	6/7/05	Nitrogen, Nitrate + Nitrite (as N)	< 0.05	mg/L	0.05
200.8	ROH	6/6/05	Selenium, Se	< 3.0	µg/L	3.0
200.7	RJA	6/8/05	Silver, Ag	< 20	µg/L	20
200.7	RJA	6/8/05	Sodium, Na	4.2	mg/L	0.4
200.7	RJA	6/8/05	Zinc, Zn	< 10	µg/L	10

End of Report

Report Approved By: Deborah K. Johnson

Deborah K. Johnson

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Aqua Tech Environmental Laboratories, Inc.

- CERTIFICATE OF ANALYSIS -

Client #: I0043
Wil Research Laboratories
1407 George Road
Ashland, OH 44805
Attn: Lisa Snyder DVM

Report Date: *15-Jun-05*

Phone: (419) 289-8700 **Ext:**
FAX: (419) 289-3650

Our Lab#: MAR05-08338 **Your Sample ID:** After RO-N
Date Logged In: 6/3/05 **Sample Source:** Other/Undefined
Sample Type: Water **Client Project #:** 2005 Annual
Project #: **Date Submitted to Lab:** 6/3/2005 **PO#:** 24977

- COLLECTION INFORMATION -

Date/Time/By: 6/2/05 8:36 AM J.T. Simpson

EPA Method	Analyst	Prep Date	Analysis Date
524.2	SLC		6/10/05

CAS Number	Parameter	Result	PQL
71-43-2	Benzene	< 0.5 ug/l	0.5
75-25-2	Bromoform	9.4 ug/l	0.5
75-27-4	Bromodichloromethane	12 ug/l	0.5
56-23-5	Carbon tetrachloride	< 0.5 ug/l	0.5
108-90-7	Chlorobenzene	< 0.5 ug/l	0.5
67-66-3	Chloroform	7.1 ug/l	0.5
124-48-1	Dibromochloromethane	16 ug/l	0.5
95-50-1	1,2-Dichlorobenzene	< 0.5 ug/l	0.5
106-46-7	1,4-Dichlorobenzene	< 0.5 ug/l	0.5
107-06-2	1,2-Dichloroethane	< 0.5 ug/l	0.5
75-35-4	1,1-Dichloroethene	< 0.5 ug/l	0.5
156-59-2	cis-1,2-Dichloroethene	< 0.5 ug/l	0.5
156-60-5	trans-1,2-Dichloroethene	< 0.5 ug/l	0.5
78-87-5	1,2-Dichloropropane	< 0.5 ug/l	0.5
100-41-4	Ethylbenzene	< 0.5 ug/l	0.5
75-09-2	Methylene chloride	< 0.5 ug/l	0.5
100-42-5	Styrene	< 0.5 ug/l	0.5
127-18-4	Tetrachloroethene	< 0.5 ug/l	0.5
108-88-3	Toluene	< 0.5 ug/l	0.5
71-55-6	1,1,1-Trichloroethane	< 0.5 ug/l	0.5
79-00-5	1,1,2-Trichloroethane	< 0.5 ug/l	0.5

Your Sample ID: After RO-N

Lab Number MAR05-08338

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CAS Number	Parameter	Result	Typical Report Limit
79-01-6	Trichloroethene	< 0.5 ug/l	0.5
95-47-6	o-Xylene	< 0.5 ug/l	0.5
120-82-1	1,2,4-Trichlorobenzene	< 0.5 ug/l	0.5
75-01-4	Vinyl chloride	< 0.5 ug/l	0.5
108383/106	m&p Xylenes	< 1.0 ug/l	1
	Xylene, Total	< 1.5 ug/l	1.5

--- Surrogate Recoveries ---

QC Lab#	EPA Method	Surrogate Name	Percent Recovery	Lower Limit	Upper Limit
MAR05-08338	524.2	1,2-Dichlorobenzene-d4 (Surr)	112 %R	70	130
MAR05-08338	524.2	Bromofluorobenzene (BFB) (Surr)	105 %R	70	130

End of Report

Report Approved By: Michael Hoaglin

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Your Sample ID: After RO-N

Lab Number MAR05-08338

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ATEL

Aqua Tech Environmental Laboratories, Inc.

- CERTIFICATE OF ANALYSIS -

Client #: 10043
Wil Research Laboratories
1407 Montgomery Twp #805
Ashland, OH 44805
Attn: Lisa Snyder

Report Date: *20-Jun-05*
Total Number of Pages: 2

Phone: (419) 289-8700 **Ext:**
FAX: (419) 289-3650

Our Lab#: MEL05-02882 **Your Sample ID:** After RO-N
Date Logged In: 6/3/05 **Sample Source:** Drinking Water
Sample Type: Water **Client Project #:**
Project #: **Date Submitted to Lab:** 6/3/2005 **PO#:** 24977

- COLLECTION INFORMATION -

Date/Time/By: 6/2/2005 8:36 AM Joe Tate Simpson

EPA Method	Analyst	Prep Date	Analysis Date
507	TMH	6/6/2005	6/9/2005

CAS Number	Parameter	Result	Report Limit
15972-60-8	Alachlor	< 0.20 ug/l	0.20
1912-24-9	Atrazine	< 0.30 ug/l	0.30
51218-45-2	Metolachlor	< 5.0 ug/l	5.0
21087-64-9	Metribuzin	< 2.0 ug/l	2.0
122-34-9	Simazine	< 0.40 ug/l	0.40

EPA Method	Analyst	Prep Date	Analysis Date
508	RDK	6/6/2005	6/9/2005

CAS Number	Parameter	Result	Report Limit
309-00-2	Aldrin	< 30 ug/l	30
58-89-9	gamma-BHC (Lindane)	< 0.02 ug/l	0.02
57-74-9	Chlordane(Total)	< 0.20 ug/l	0.20
60-57-1	Dieldrin	< 20 ug/l	20
72-20-8	Endrin	< 0.20 ug/l	0.20
76-44-8	Heptachlor	< 0.04 ug/l	0.04
1024-57-3	Heptachlor epoxide	< 0.02 ug/l	0.02
118-74-1	Hexachlorobenzene	< 0.10 ug/l	0.10
77-47-4	Hexachlorocyclopentadiene	< 5.0 ug/l	5.0
72-43-5	Methoxychlor	< 4.0 ug/l	4.0
	Total PCB	< 0.50 ug/l	0.50
8001-35-2	Toxaphene	< 1.0 ug/l	1.0

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EPA Method	Analyst	Prep Date	Analysis Date
515.1	AFK	6/7/2005	6/11/2005

CAS Number	Parameter	Result	Report Limit
75-99-0	Dalapon	< 20 ug/l	20
1918-00-9	Dicamba	< 10 ug/l	10
94-75-7	2,4-Dichlorophenoxyacetic acid (2,4-D)	< 7.0 ug/l	7.0
88-85-7	Dinoseb	< 0.70 ug/l	0.70
87-86-5	Pentachlorophenol	< 0.10 ug/l	0.10
1918-02-1	Picloram	< 50 ug/l	50
93-72-1	Silvex	< 5.0 ug/l	5.0

EPA Method	Analyst	Prep Date	Analysis Date
531.1	TAG		6/10/2005

CAS Number	Parameter	Result	Report Limit
LFB recoveries for oxamyl and sulfone were above method acceptance limits. The target analytes were not detected in sample.			
116-06-3	Aldicarb	< 0.7 ug/l	0.7
1646-88-4	Aldicarb sulfone	< 0.7 ug/l	0.7
1646-87-3	Aldicarb sulfoxide	< 0.7 ug/l	0.7
63-25-2	Carbaryl	< 10 ug/l	10
1563-66-2	Carbofuran	< 4.0 ug/l	4.0
16655-82-6	3-Hydroxycarbofuran	< 10 ug/l	10
16752-77-5	Methomyl	< 50 ug/l	50
23135-22-0	Oxamyl	< 20 ug/l	20

--- Surrogate Recoveries ---

QC Lab#	EPA Method	Surrogate Name	Percent Recovery	Lower Limit	Upper Limit
MEL05-02882	507	DMNB (Surr)	71 %R	70	130
MEL05-02882	508	Decachlorobiphenyl (Surr)	90 %R	70	130
MEL05-02882	515.1	DCAA (Surr)	122 %R	70	130

End of Report

Report Approved By: Todd M. Brown

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ATEL

Aqua Tech Environmental Laboratories, Inc.

- CERTIFICATE OF ANALYSIS -

Client #: I0043
Wil Research Laboratories
1407 George Road
Ashland, OH 44805

Attn: Lisa Snyder DVM

Report Date: *15-Jun-05*

Phone: (419) 289-8700 **Ext:**
FAX: (419) 289-3650

Our Lab #: MAR05-08330
Date Logged-In: 6/3/05
Sample Type: Water
Project #:

Your Sample ID: Prior to RO-W
Sample Source: Other/Undefined
Client Project #: 2005 Annual
Date Submitted to Lab: 6/3/2005
PO#: 24977

- COLLECTION INFORMATION -

Date/Time/By: 6/2/05 9:08 AM J.T. Simpson

EPA Method	Analyst	Analysis Date	Parameter	Result	Units	PQL
200.8	ROH	6/6/05	Arsenic, As	< 3.0	µg/L	3.0
200.8	ROH	6/6/05	Barium, Ba	< 10	µg/L	10
200.8	ROH	6/6/05	Cadmium, Cd	< 0.5	µg/L	0.5
200.7	RJA	6/8/05	Chromium, Cr	< 20	µg/L	20
200.7	RJA	6/8/05	Copper, Cu	< 10	µg/L	10
SM 4500F-C	LGE	6/7/05	Fluoride, F, Dissolved	0.84	mg/L	0.10
200.8	ROH	6/6/05	Lead, Pb	< 2.0	µg/L	2.0
245.2	RJA	6/8/05	Mercury, Hg	< 0.2	µg/L	0.2
200.8	ROH	6/6/05	Nickel, Ni	< 10	µg/L	10
SM4500-NO3-F	TLL	6/7/05	Nitrogen, Nitrate + Nitrite (as N)	< 0.05	mg/L	0.05
200.8	ROH	6/6/05	Selenium, Se	< 3.0	µg/L	3.0
200.7	RJA	6/8/05	Silver, Ag	< 20	µg/L	20
200.7	RJA	6/8/05	Sodium, Na	92	mg/L	0.4
200.7	RJA	6/8/05	Zinc, Zn	< 10	µg/L	10

End of Report

Report Approved By: Deborah K. Johnson

Deborah K. Johnson

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Reviewed and OK LTS 6/24/0

ATEL

Aqua Tech Environmental Laboratories, Inc.

- CERTIFICATE OF ANALYSIS -

Client #: I0043

Wil Research Laboratories

1407 George Road

Ashland, OH 44805

Attn: Lisa Snyder DVM

Report Date: *15-Jun-05*

Phone: (419) 289-8700 **Ext:**

FAX: (419) 289-3650

Our Lab#: MAR05-08339 **Your Sample ID:** Prior to RO-W

Date Logged In: 6/3/05 **Sample Source:** Other/Undefined

Sample Type: Water **Client Project #:** 2005 Annual

Project #: **Date Submitted to Lab:** 6/3/2005 **PO#:** 24977

- COLLECTION INFORMATION -

Date/Time/By: 6/2/05 9:08 AM J.T. Simpson

EPA Method	Analyst	Prep Date	Analysis Date
524.2	SLC		6/10/05

CAS Number	Parameter	Result	PQL
71-43-2	Benzene	< 0.5 ug/l	0.5
75-25-2	Bromoform	< 0.5 ug/l	0.5
75-27-4	Bromodichloromethane	2.9 ug/l	0.5
56-23-5	Carbon tetrachloride	< 0.5 ug/l	0.5
108-90-7	Chlorobenzene	< 0.5 ug/l	0.5
67-66-3	Chloroform	7.9 ug/l	0.5
124-48-1	Dibromochloromethane	< 0.5 ug/l	0.5
95-50-1	1,2-Dichlorobenzene	< 0.5 ug/l	0.5
106-46-7	1,4-Dichlorobenzene	< 0.5 ug/l	0.5
107-06-2	1,2-Dichloroethane	< 0.5 ug/l	0.5
75-35-4	1,1-Dichloroethene	< 0.5 ug/l	0.5
156-59-2	cis-1,2-Dichloroethene	< 0.5 ug/l	0.5
156-60-5	trans-1,2-Dichloroethene	< 0.5 ug/l	0.5
78-87-5	1,2-Dichloropropane	< 0.5 ug/l	0.5
100-41-4	Ethylbenzene	< 0.5 ug/l	0.5
75-09-2	Methylene chloride	< 0.5 ug/l	0.5
100-42-5	Styrene	< 0.5 ug/l	0.5
127-18-4	Tetrachloroethene	< 0.5 ug/l	0.5
108-88-3	Toluene	< 0.5 ug/l	0.5
71-55-6	1,1,1-Trichloroethane	< 0.5 ug/l	0.5
79-00-5	1,1,2-Trichloroethane	< 0.5 ug/l	0.5

Your Sample ID: Prior to RO-W *Lab Number MAR05-08339* 01

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Aqua Tech Environmental Laboratories, Inc.

- CERTIFICATE OF ANALYSIS -

CAS Number	Parameter	Result	Typical Report Limit
79-01-6	Trichloroethene	< 0.5 ug/l	0.5
95-47-6	o-Xylene	< 0.5 ug/l	0.5
120-82-1	1,2,4-Trichlorobenzene	< 0.5 ug/l	0.5
75-01-4	Vinyl chloride	< 0.5 ug/l	0.5
108383/106	m&p Xylenes	< 1.0 ug/l	1
	Xylene, Total	< 1.5 ug/l	1.5

--- Surrogate Recoveries ---

QC Lab#	EPA Method	Surrogate Name	Percent Recovery	Lower Limit	Upper Limit
MAR05-08339	524.2	1,2-Dichlorobenzene-d4 (Surr)	110 %R	70	130
MAR05-08339	524.2	Bromofluorobenzene (BFB) (Surr)	106 %R	70	130

End of Report

Report Approved By: MICHAEL HERDLICH

Your Sample ID: Prior to RO-W

Lab Number MAR05-08339

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ATEL

Aqua Tech Environmental Laboratories, Inc.

- CERTIFICATE OF ANALYSIS -

Client #: I0043
Wil Research Laboratories
1407 Montgomery Twp #805
Ashland, OH 44805
Attn: Lisa Snyder

Report Date: *20-Jun-05*
Total Number of Pages: 2

Phone: (419) 289-8700 **Ext:**
FAX: (419) 289-3650

Our Lab#: MEL05-02883 **Your Sample ID:** Prior to RO-W
Date Logged In: 6/3/05 **Sample Source:** Drinking Water
Sample Type: Water **Client Project #:**
Project #: **Date Submitted to Lab:** 6/3/2005 **PO#:** 24977

- COLLECTION INFORMATION -

Date/Time/By: 6/2/2005 9:08 AM Joe Tate Simpson

EPA Method	Analyst	Prep Date	Analysis Date
507	TMH	6/6/2005	6/9/2005

CAS Number	Parameter	Result	Report Limit
15972-60-8	Alachlor	< 0.20 ug/l	0.20
1912-24-9	Atrazine	< 0.30 ug/l	0.30
51218-45-2	Metolachlor	< 5.0 ug/l	5.0
21087-64-9	Metribuzin	< 2.0 ug/l	2.0
122-34-9	Simazine	< 0.40 ug/l	0.40

EPA Method	Analyst	Prep Date	Analysis Date
508	RDK	6/6/2005	6/9/2005

CAS Number	Parameter	Result	Report Limit
309-00-2	Aldrin	< 30 ug/l	30
58-89-9	gamma-BHC (Lindane)	< 0.02 ug/l	0.02
57-74-9	Chlordane(Total)	< 0.20 ug/l	0.20
60-57-1	Dieldrin	< 20 ug/l	20
72-20-8	Endrin	< 0.20 ug/l	0.20
76-44-8	Heptachlor	< 0.04 ug/l	0.04
1024-57-3	Heptachlor epoxide	< 0.02 ug/l	0.02
118-74-1	Hexachlorobenzene	< 0.10 ug/l	0.10
77-47-4	Hexachlorocyclopentadiene	< 5.0 ug/l	5.0
72-43-5	Methoxychlor	< 4.0 ug/l	4.0
	Total PCB	< 0.50 ug/l	0.50
8001-35-2	Toxaphene	< 1.0 ug/l	1.0

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EPA Method	Analyst	Prep Date	Analysis Date
515.1	AFK	6/7/2005	6/11/2005

CAS Number	Parameter	Result	Report Limit
75-99-0	Dalapon	< 20 ug/l	20
1918-00-9	Dicamba	< 10 ug/l	10
94-75-7	2,4-Dichlorophenoxyacetic acid (2,4-D)	< 7.0 ug/l	7.0
88-85-7	Dinoseb	< 0.70 ug/l	0.70
87-86-5	Pentachlorophenol	< 0.10 ug/l	0.10
1918-02-1	Picloram	< 50 ug/l	50
93-72-1	Silvex	< 5.0 ug/l	5.0

EPA Method	Analyst	Prep Date	Analysis Date
531.1	TAG		6/10/2005

CAS Number	Parameter	Result	Report Limit
LFB recoveries for oxamyl and sulfone were above method acceptance limits. The target analytes were not detected in sample.			
116-06-3	Aldicarb	< 0.7 ug/l	0.7
1646-88-4	Aldicarb sulfone	< 0.7 ug/l	0.7
1646-87-3	Aldicarb sulfoxide	< 0.7 ug/l	0.7
63-25-2	Carbaryl	< 10 ug/l	10
1563-66-2	Carbofuran	< 4.0 ug/l	4.0
16655-82-6	3-Hydroxycarbofuran	< 10 ug/l	10
16752-77-5	Methomyl	< 50 ug/l	50
23135-22-0	Oxamyl	< 20 ug/l	20

--- Surrogate Recoveries ---

QC Lab#	EPA Method	Surrogate Name	Percent Recovery	Lower Limit	Upper Limit
MEL05-02883	507	DMNB (Surr)	73 %R	70	130
MEL05-02883	508	Decachlorobiphenyl (Surr)	101 %R	70	130
MEL05-02883	515.1	DCAA (Surr)	130 %R	70	130

End of Report

Report Approved By: Todd M. Brown

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Aqua Tech Environmental Laboratories, Inc.

- CERTIFICATE OF ANALYSIS -

Client #: I0043
Wil Research Laboratories
1407 George Road
Ashland, OH 44805

Attn: Lisa Snyder DVM

Report Date: *15-Jun-05*

Phone: (419) 289-8700 **Ext:**
FAX: (419) 289-3650

Our Lab #: MAR05-08331
Date Logged-In: 6/3/05
Sample Type: Water
Project #:

Your Sample ID: After RO-W
Sample Source: Other/Undefined
Client Project #: 2005 Annual
Date Submitted to Lab: 6/3/2005 **PO#:** 24977

- COLLECTION INFORMATION -

Date/Time/By: 6/2/05 9:05 AM J.T. Simpson

EPA Method	Analyst	Analysis Date	Parameter	Result	Units	PQL
200.8	ROH	6/6/05	Arsenic, As	< 3.0	µg/L	3.0
200.8	ROH	6/6/05	Barium, Ba	< 10	µg/L	10
200.8	ROH	6/6/05	Cadmium, Cd	< 0.5	µg/L	0.5
200.7	RJA	6/8/05	Chromium, Cr	< 20	µg/L	20
200.7	RJA	6/8/05	Copper, Cu	< 10	µg/L	10
SM 4500F-C	LGE	6/7/05	Fluoride, F, Dissolved	< 0.10	mg/L	0.10
200.8	ROH	6/6/05	Lead, Pb	< 2.0	µg/L	2.0
245.2	RJA	6/8/05	Mercury, Hg	< 0.2	µg/L	0.2
200.8	ROH	6/6/05	Nickel, Ni	< 10	µg/L	10
SM4500-NO3-F	TLL	6/7/05	Nitrogen, Nitrate + Nitrite (as N)	< 0.05	mg/L	0.05
200.8	ROH	6/6/05	Selenium, Se	< 3.0	µg/L	3.0
200.7	RJA	6/8/05	Silver, Ag	< 20	µg/L	20
200.7	RJA	6/8/05	Sodium, Na	1.0	mg/L	0.4
200.7	RJA	6/8/05	Zinc, Zn	< 10	µg/L	10

End of Report

Report Approved By: Deborah K. Johnson

Deborah K. Johnson

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Aqua Tech Environmental Laboratories, Inc.

- CERTIFICATE OF ANALYSIS -

Client #: I0043

Wil Research Laboratories

1407 George Road

Ashland, OH 44805

Attn: Lisa Snyder DVM

Report Date: *15-Jun-05*

Phone: (419) 289-8700 **Ext:**

FAX: (419) 289-3650

Our Lab#: MAR05-08340 **Your Sample ID:** After RO-W

Date Logged In: 6/3/05 **Sample Source:** Other/Undefined

Sample Type: Water **Client Project #:** 2005 Annual

Project #: **Date Submitted to Lab:** 6/3/2005 **PO#:** 24977

- COLLECTION INFORMATION -

Date/Time/By: 6/2/05 9:05 AM J.T. Simpson

EPA Method	Analyst	Prep Date	Analysis Date
524.2	SLC		6/10/05

CAS Number	Parameter	Result	PQL
71-43-2	Benzene	< 0.5 ug/l	0.5
75-25-2	Bromoform	0.7 ug/l	0.5
75-27-4	Bromodichloromethane	6.5 ug/l	0.5
56-23-5	Carbon tetrachloride	< 0.5 ug/l	0.5
108-90-7	Chlorobenzene	< 0.5 ug/l	0.5
67-66-3	Chloroform	7.6 ug/l	0.5
124-48-1	Dibromochloromethane	3.1 ug/l	0.5
95-50-1	1,2-Dichlorobenzene	< 0.5 ug/l	0.5
106-46-7	1,4-Dichlorobenzene	< 0.5 ug/l	0.5
107-06-2	1,2-Dichloroethane	< 0.5 ug/l	0.5
75-35-4	1,1-Dichloroethene	< 0.5 ug/l	0.5
156-59-2	cis-1,2-Dichloroethene	< 0.5 ug/l	0.5
156-60-5	trans-1,2-Dichloroethene	< 0.5 ug/l	0.5
78-87-5	1,2-Dichloropropane	< 0.5 ug/l	0.5
100-41-4	Ethylbenzene	< 0.5 ug/l	0.5
75-09-2	Methylene chloride	< 0.5 ug/l	0.5
100-42-5	Styrene	< 0.5 ug/l	0.5
127-18-4	Tetrachloroethene	< 0.5 ug/l	0.5
108-88-3	Toluene	< 0.5 ug/l	0.5
71-55-6	1,1,1-Trichloroethane	< 0.5 ug/l	0.5
79-00-5	1,1,2-Trichloroethane	< 0.5 ug/l	0.5

Your Sample ID: After RO-W *Lab Number MAR05-08340*

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CAS Number	Parameter	Result	Typical Report Limit
79-01-6	Trichloroethene	< 0.5 ug/l	0.5
95-47-6	o-Xylene	< 0.5 ug/l	0.5
120-82-1	1,2,4-Trichlorobenzene	< 0.5 ug/l	0.5
75-01-4	Vinyl chloride	< 0.5 ug/l	0.5
108383/106	m&p Xylenes	< 1.0 ug/l	1
	Xylene, Total	< 1.5 ug/l	1.5

--- Surrogate Recoveries ---

)C Lab#	EPA Method	Surrogate Name	Percent Recovery	Lower Limit	Upper Limit
MAR05-08340	524.2	1,2-Dichlorobenzene-d4 (Surr)	116 %R	70	130
MAR05-08340	524.2	Bromofluorobenzene (BFB) (Surr)	109 %R	70	130

End of Report

Report Approved By: MICHAEL HEDDLICH

Your Sample ID: After RO-W

Lab Number MAR05-08340

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- CERTIFICATE OF ANALYSIS -

Client #: 10043
Wil Research Laboratories
1407 Montgomery Twp #805
Ashland, OH 44805
Attn: Lisa Snyder

Report Date: *20-Jun-05*
Total Number of Pages: 2

Phone: (419) 289-8700 **Ext:**
FAX: (419) 289-3650

Our Lab#: MEL05-02884 **Your Sample ID:** After RO-W
Date Logged In: 6/3/05 **Sample Source:** Drinking Water
Sample Type: Water **Client Project #:**
Project #: **Date Submitted to Lab:** 6/3/2005 **PO#:** 24977

- COLLECTION INFORMATION -

Date/Time/By: 6/2/2005 9:05 AM Joe Tate Simpson

EPA Method	Analyst	Prep Date	Analysis Date		
507	TMH	6/6/2005	6/9/2005		
	CAS Number	**Parameter**		**Result**	**Report Limit**
	15972-60-8	Alachlor		< 0.20 ug/l	0.20
	1912-24-9	Atrazine		< 0.30 ug/l	0.30
	51218-45-2	Metolachlor		< 5.0 ug/l	5.0
	21087-64-9	Metribuzin		< 2.0 ug/l	2.0
	122-34-9	Simazine		< 0.40 ug/l	0.40
EPA Method	**Analyst**	**Prep Date**	**Analysis Date**		
508	RDK	6/6/2005	6/9/2005		
	CAS Number	**Parameter**		**Result**	**Report Limit**
	309-00-2	Aldrin		< 30 ug/l	30
	58-89-9	gamma-BHC (Lindane)		< 0.02 ug/l	0.02
	57-74-9	Chlordane(Total)		< 0.20 ug/l	0.20
	60-57-1	Dieldrin		< 20 ug/l	20
	72-20-8	Endrin		< 0.20 ug/l	0.20
	76-44-8	Heptachlor		< 0.04 ug/l	0.04
	1024-57-3	Heptachlor epoxide		< 0.02 ug/l	0.02
	118-74-1	Hexachlorobenzene		< 0.10 ug/l	0.10
	77-47-4	Hexachlorocyclopentadiene		< 5.0 ug/l	5.0
	72-43-5	Methoxychlor		< 4.0 ug/l	4.0
		Total PCB		< 0.50 ug/l	0.50
	8001-35-2	Toxaphene		< 1.0 ug/l	1.0

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EPA Method	Analyst	Prep Date	Analysis Date
515.1	AFK	6/7/2005	6/11/2005

CAS Number	Parameter	Result	Report Limit
75-99-0	Dalapon	< 20 ug/l	20
1918-00-9	Dicamba	< 10 ug/l	10
94-75-7	2,4-Dichlorophenoxyacetic acid (2,4-D)	< 7.0 ug/l	7.0
88-85-7	Dinoseb	< 0.70 ug/l	0.70
87-86-5	Pentachlorophenol	< 0.10 ug/l	0.10
1918-02-1	Picloram	< 50 ug/l	50
93-72-1	Silvex	< 5.0 ug/l	5.0

EPA Method	Analyst	Prep Date	Analysis Date
531.1	TAG		6/10/2005

CAS Number	Parameter	Result	Report Limit
LFB recoveries for oxamyl and sulfone were above method acceptance limits. The target analytes were not detected in sample.			
116-06-3	Aldicarb	< 0.7 ug/l	0.7
1646-88-4	Aldicarb sulfone	< 0.7 ug/l	0.7
1646-87-3	Aldicarb sulfoxide	< 0.7 ug/l	0.7
63-25-2	Carbaryl	< 10 ug/l	10
1563-66-2	Carbofuran	< 4.0 ug/l	4.0
16655-82-6	3-Hydroxycarbofuran	< 10 ug/l	10
16752-77-5	Methomyl	< 50 ug/l	50
23135-22-0	Oxamyl	< 20 ug/l	20

--- Surrogate Recoveries ---

QC Lab#	EPA Method	Surrogate Name	Percent Recovery	Lower Limit	Upper Limit
MEL05-02884	507	DMNB (Surr)	76 %R	70	130
MEL05-02884	508	Decachlorobiphenyl (Surr)	95 %R	70	130
MEL05-02884	515.1	DCAA (Surr)	116 %R	70	130

End of Report

Report Approved By: Todd M. Brown

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Aqua Tech Environmental Laboratories, Inc.

- CERTIFICATE OF ANALYSIS -

Client #: I0043
Wil Research Laboratories
1407 George Road
Ashland, OH 44805

Attn: Lisa Snyder DVM

Report Date: *15-Jun-05*

Phone: (419) 289-8700 **Ext:**
FAX: (419) 289-3650

Our Lab #: MAR05-08335
Date Logged-In: 6/3/05
Sample Type: Water
Project #:

Your Sample ID: B-12
Sample Source: Other/Undefined
Client Project #: 2005 Annual
Date Submitted to Lab: 6/3/2005 **PO#:** 24977

- COLLECTION INFORMATION -

Date/Time/By: 6/2/05 11:27 AM J.T. Simpson

EPA Method	Analyst	Analysis Date	Parameter	Result	Units	PQL
200.8	ROH	6/6/05	Arsenic, As	< 3.0	µg/L	3.0
200.8	ROH	6/6/05	Barium, Ba	< 10	µg/L	10
200.8	ROH	6/6/05	Cadmium, Cd	< 0.5	µg/L	0.5
200.7	RJA	6/8/05	Chromium, Cr	< 20	µg/L	20
200.7	RJA	6/8/05	Copper, Cu	< 10	µg/L	10
SM 4500F-C	LGE	6/7/05	Fluoride, F, Dissolved	< 0.10	mg/L	0.10
200.8	ROH	6/6/05	Lead, Pb	< 2.0	µg/L	2.0
245.2	RJA	6/8/05	Mercury, Hg	< 0.2	µg/L	0.2
200.8	ROH	6/6/05	Nickel, Ni	< 10	µg/L	10
SM4500-NO3-F	TLL	6/7/05	Nitrogen, Nitrate + Nitrite (as N)	< 0.05	mg/L	0.05
200.8	ROH	6/6/05	Selenium, Se	< 3.0	µg/L	3.0
200.7	RJA	6/8/05	Silver, Ag	< 20	µg/L	20
200.7	RJA	6/8/05	Sodium, Na	3.8	mg/L	0.4
200.7	RJA	6/8/05	Zinc, Zn	< 10	µg/L	10

End of Report

Report Approved By: Deborah K. Johnson

Deborah K. Johnson

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Aqua Tech Environmental Laboratories, Inc.

- CERTIFICATE OF ANALYSIS -

Client #: I0043 **Report Date:** *15-Jun-05*

Wil Research Laboratories
1407 George Road
Ashland, OH 44805

Phone: (419) 289-8700 **Ext:**
FAX: (419) 289-3650

Attn: Lisa Snyder DVM

Our Lab#: MAR05-08344 **Your Sample ID:** B-12
Date Logged In: 6/3/05 **Sample Source:** Other/Undefined
Sample Type: Water **Client Project #:** 2005 Annual
Project #: **Date Submitted to Lab:** 6/3/2005 **PO#:** 24977

- COLLECTION INFORMATION -

Date/Time/By: 6/2/05 11:27 AM J.T. Simpson

EPA Method	Analyst	Prep Date	Analysis Date
524.2	SLC		6/10/05

CAS Number	Parameter	Result	PQL
71-43-2	Benzene	< 0.5 ug/l	0.5
75-25-2	Bromoform	< 0.5 ug/l	0.5
75-27-4	Bromodichloromethane	3.1 ug/l	0.5
56-23-5	Carbon tetrachloride	< 0.5 ug/l	0.5
108-90-7	Chlorobenzene	< 0.5 ug/l	0.5
67-66-3	Chloroform	4.8 ug/l	0.5
124-48-1	Dibromochloromethane	0.6 ug/l	0.5
95-50-1	1,2-Dichlorobenzene	< 0.5 ug/l	0.5
106-46-7	1,4-Dichlorobenzene	< 0.5 ug/l	0.5
107-06-2	1,2-Dichloroethane	< 0.5 ug/l	0.5
75-35-4	1,1-Dichloroethene	< 0.5 ug/l	0.5
156-59-2	cis-1,2-Dichloroethene	< 0.5 ug/l	0.5
156-60-5	trans-1,2-Dichloroethene	< 0.5 ug/l	0.5
78-87-5	1,2-Dichloropropane	< 0.5 ug/l	0.5
100-41-4	Ethylbenzene	< 0.5 ug/l	0.5
75-09-2	Methylene chloride	< 0.5 ug/l	0.5
100-42-5	Styrene	< 0.5 ug/l	0.5
127-18-4	Tetrachloroethene	< 0.5 ug/l	0.5
108-88-3	Toluene	< 0.5 ug/l	0.5
71-55-6	1,1,1-Trichloroethane	< 0.5 ug/l	0.5
79-00-5	1,1,2-Trichloroethane	< 0.5 ug/l	0.5

Your Sample ID: B-12 *Lab Number MAR05-08344*

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CAS Number	Parameter	Result	Typical Report Limit
79-01-6	Trichloroethene	< 0.5 ug/l	0.5
95-47-6	o-Xylene	< 0.5 ug/l	0.5
120-82-1	1,2,4-Trichlorobenzene	< 0.5 ug/l	0.5
75-01-4	Vinyl chloride	< 0.5 ug/l	0.5
108383/106	m&p Xylenes	< 1.0 ug/l	1
	Xylene, Total	< 1.5 ug/l	1.5

--- Surrogate Recoveries ---

QC Lab#	EPA Method	Surrogate Name	Percent Recovery	Lower Limit	Upper Limit
MAR05-08344	524.2	1,2-Dichlorobenzene-d4 (Surr)	110 %R	70	130
MAR05-08344	524.2	Bromofluorobenzene (BFB) (Surr)	108 %R	70	130

End of Report

Report Approved By: MICHAEL HERSLICH

Your Sample ID: B-12 *Lab Number MAR05-08344*

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- CERTIFICATE OF ANALYSIS -

Client #: I0043
Wil Research Laboratories
1407 Montgomery Twp #805
Ashland, OH 44805
Attn: Lisa Snyder

Report Date: *20-Jun-05*
Total Number of Pages: 2

Phone: (419) 289-8700 **Ext:**
FAX: (419) 289-3650

Our Lab#: MEL05-02888 **Your Sample ID:** B-12
Date Logged In: 6/3/05 **Sample Source:** Drinking Water
Sample Type: Water **Client Project #:**
Project #: **Date Submitted to Lab:** 6/3/2005 **PO#:** 24977

- COLLECTION INFORMATION -

Date/Time/By: 6/2/2005 11:27 AM Joe Tate Simpson

EPA Method	Analyst	Prep Date	Analysis Date
507	TMH	6/6/2005	6/9/2005

CAS Number	Parameter	Result	Report Limit
15972-60-8	Alachlor	< 0.20 ug/l	0.20
1912-24-9	Atrazine	< 0.30 ug/l	0.30
51218-45-2	Metolachlor	< 5.0 ug/l	5.0
21087-64-9	Metribuzin	< 2.0 ug/l	2.0
122-34-9	Simazine	< 0.40 ug/l	0.40

EPA Method	Analyst	Prep Date	Analysis Date
508	RDK	6/6/2005	6/9/2005

CAS Number	Parameter	Result	Report Limit
309-00-2	Aldrin	< 30 ug/l	30
58-89-9	gamma-BHC (Lindane)	< 0.02 ug/l	0.02
57-74-9	Chlordane(Total)	< 0.20 ug/l	0.20
60-57-1	Dieldrin	< 20 ug/l	20
72-20-8	Endrin	< 0.20 ug/l	0.20
76-44-8	Heptachlor	< 0.04 ug/l	0.04
1024-57-3	Heptachlor epoxide	< 0.02 ug/l	0.02
118-74-1	Hexachlorobenzene	< 0.10 ug/l	0.10
77-47-4	Hexachlorocyclopentadiene	< 5.0 ug/l	5.0
72-43-5	Methoxychlor	< 4.0 ug/l	4.0
	Total PCB	< 0.50 ug/l	0.50
8001-35-2	Toxaphene	< 1.0 ug/l	1.0

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Aqua Tech Environmental Laboratories, Inc.

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EPA Method	Analyst	Prep Date	Analysis Date
515.1	AFK	6/7/2005	6/11/2005

CAS Number	Parameter	Result	Report Limit
75-99-0	Dalapon	< 20 ug/l	20
1918-00-9	Dicamba	< 10 ug/l	10
94-75-7	2,4-Dichlorophenoxyacetic acid (2,4-D)	< 7.0 ug/l	7.0
88-85-7	Dinoseb	< 0.70 ug/l	0.70
87-86-5	Pentachlorophenol	< 0.10 ug/l	0.10
1918-02-1	Picloram	< 50 ug/l	50
93-72-1	Silvex	< 5.0 ug/l	5.0

EPA Method	Analyst	Prep Date	Analysis Date
531.1	TAG		6/10/2005

CAS Number	Parameter	Result	Report Limit
	CCV recovery for oxamyl was above method acceptance limits. LFB recoveries for propoxur and methiocarb were above method acceptance limits. The target analytes were not detected in sample.		
116-06-3	Aldicarb	< 0.7 ug/l	0.7
1646-88-4	Aldicarb sulfone	< 0.7 ug/l	0.7
1646-87-3	Aldicarb sulfoxide	< 0.7 ug/l	0.7
63-25-2	Carbaryl	< 10 ug/l	10
1563-66-2	Carbofuran	< 4.0 ug/l	4.0
16655-82-6	3-Hydroxycarbofuran	< 10 ug/l	10
16752-77-5	Methomyl	< 50 ug/l	50
23135-22-0	Oxamyl	< 20 ug/l	20

--- Surrogate Recoveries ---

QC Lab#	EPA Method	Surrogate Name	Percent Recovery	Lower Limit	Upper Limit
MEL05-02888	507	DMNB (Surr)	88 %R	70	130
MEL05-02888	508	Decachlorobiphenyl (Surr)	109 %R	70	130
MEL05-02888	515.1	DCAA (Surr)	125 %R	70	130

End of Report

Report Approved By: Todd M. Brown

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Aqua Tech Environmental Laboratories, Inc.

- CERTIFICATE OF ANALYSIS -

Client #: I0043
Wil Research Laboratories
1407 George Road
Ashland, OH 44805

Attn: Lisa Snyder DVM

Report Date: *15-Jun-05*

Phone: (419) 289-8700 **Ext:**
FAX: (419) 289-3650

Our Lab #: MAR05-08333
Date Logged-In: 6/3/05
Sample Type: Water
Project #:

Your Sample ID: B-62
Sample Source: Other/Undefined
Client Project #: 2005 Annual
Date Submitted to Lab: 6/3/2005 **PO#:** 24977

- COLLECTION INFORMATION -

Date/Time/By: 6/2/05 12:17 PM J.T. Simpson

EPA Method	Analyst	Analysis Date	Parameter	Result	Units	PQL
200.8	ROH	6/6/05	Arsenic, As	< 3.0	µg/L	3.0
200.8	ROH	6/6/05	Barium, Ba	< 10	µg/L	10
200.8	ROH	6/6/05	Cadmium, Cd	< 0.5	µg/L	0.5
200.7	RJA	6/8/05	Chromium, Cr	< 20	µg/L	20
200.7	RJA	6/8/05	Copper, Cu	< 10	µg/L	10
SM 4500F-C	LGE	6/7/05	Fluoride, F, Dissolved	< 0.10	mg/L	0.10
200.8	ROH	6/6/05	Lead, Pb	< 2.0	µg/L	2.0
245.2	RJA	6/8/05	Mercury, Hg	< 0.2	µg/L	0.2
200.8	ROH	6/6/05	Nickel, Ni	< 10	µg/L	10
SM4500-NO3-F	TLL	6/7/05	Nitrogen, Nitrate + Nitrite (as N)	< 0.05	mg/L	0.05
200.8	ROH	6/6/05	Selenium, Se	< 3.0	µg/L	3.0
200.7	RJA	6/8/05	Silver, Ag	< 20	µg/L	20
200.7	RJA	6/8/05	Sodium, Na	3.9	mg/L	0.4
200.7	RJA	6/8/05	Zinc, Zn	< 10	µg/L	10

End of Report

Report Approved By: Deborah K. Johnson

Deborah K. Johnson

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ATEL

Aqua Tech Environmental Laboratories, Inc.

- CERTIFICATE OF ANALYSIS -

Client #: I0043

Wil Research Laboratories

1407 George Road

Ashland, OH 44805

Attn: Lisa Snyder DVM

Report Date: *15-Jun-05*

Phone: (419) 289-8700 **Ext:**

FAX: (419) 289-3650

Our Lab#: MAR05-08342 **Your Sample ID:** B-62

Date Logged In: 6/3/05 **Sample Source:** Other/Undefined

Sample Type: Water **Client Project #:** 2005 Annual

Project #: **Date Submitted to Lab:** 6/3/2005 **PO#:** 24977

- COLLECTION INFORMATION -

Date/Time/By: 6/2/05 12:17 PM J.T. Simpson

EPA Method	Analyst	Prep Date	Analysis Date
524.2	SLC		6/10/05

CAS Number	Parameter	Result	PQL
71-43-2	Benzene	< 0.5 ug/l	0.5
75-25-2	Bromoform	4.8 ug/l	0.5
75-27-4	Bromodichloromethane	6.7 ug/l	0.5
56-23-5	Carbon tetrachloride	< 0.5 ug/l	0.5
108-90-7	Chlorobenzene	< 0.5 ug/l	0.5
67-66-3	Chloroform	5.3 ug/l	0.5
124-48-1	Dibromochloromethane	8.8 ug/l	0.5
95-50-1	1,2-Dichlorobenzene	< 0.5 ug/l	0.5
106-46-7	1,4-Dichlorobenzene	< 0.5 ug/l	0.5
107-06-2	1,2-Dichloroethane	< 0.5 ug/l	0.5
75-35-4	1,1-Dichloroethene	< 0.5 ug/l	0.5
156-59-2	cis-1,2-Dichloroethene	< 0.5 ug/l	0.5
156-60-5	trans-1,2-Dichloroethene	< 0.5 ug/l	0.5
78-87-5	1,2-Dichloropropane	< 0.5 ug/l	0.5
100-41-4	Ethylbenzene	< 0.5 ug/l	0.5
75-09-2	Methylene chloride	< 0.5 ug/l	0.5
100-42-5	Styrene	< 0.5 ug/l	0.5
127-18-4	Tetrachloroethene	< 0.5 ug/l	0.5
108-88-3	Toluene	< 0.5 ug/l	0.5
71-55-6	1,1,1-Trichloroethane	< 0.5 ug/l	0.5
79-00-5	1,1,2-Trichloroethane	< 0.5 ug/l	0.5

Your Sample ID: B-62 *Lab Number MAR05-08342*

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CAS Number	Parameter	Result	Typical Report Limit
79-01-6	Trichloroethene	< 0.5 ug/l	0.5
95-47-6	o-Xylene	< 0.5 ug/l	0.5
120-82-1	1,2,4-Trichlorobenzene	< 0.5 ug/l	0.5
75-01-4	Vinyl chloride	< 0.5 ug/l	0.5
108383/106	m&p Xylenes	< 1.0 ug/l	1
	Xylene, Total	< 1.5 ug/l	1.5

--- Surrogate Recoveries ---

QC Lab#	EPA Method	Surrogate Name	Percent Recovery	Lower Limit	Upper Limit
MAR05-08342	524.2	1,2-Dichlorobenzene-d4 (Surr)	110 %R	70	130
MAR05-08342	524.2	Bromofluorobenzene (BFB) (Surr)	106 %R	70	130

End of Report

Report Approved By: MICHAEL HEADLEE

Your Sample ID: B-62

Lab Number MAR05-08342

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Aqua Tech Environmental Laboratories, Inc.

- CERTIFICATE OF ANALYSIS -

Client #: I0043
Wil Research Laboratories
1407 Montgomery Twp #805
Ashland, OH 44805
Attn: Lisa Snyder

Report Date: *20-Jun-05*
Total Number of Pages: 2

Phone: (419) 289-8700 **Ext:**
FAX: (419) 289-3650

Our Lab#: MEL05-02886 **Your Sample ID:** B-62
Date Logged In: 6/3/05 **Sample Source:** Drinking Water
Sample Type: Water **Client Project #:**
Project #: **Date Submitted to Lab:** 6/3/2005 **PO#:** 24977

- COLLECTION INFORMATION -

Date/Time/By: 6/2/2005 12:17 PM Joe Tate Simpson

EPA Method	Analyst	Prep Date	Analysis Date
507	TMH	6/6/2005	6/9/2005

CAS Number	Parameter	Result	Report Limit
15972-60-8	Alachlor	< 0.20 ug/l	0.20
1912-24-9	Atrazine	< 0.30 ug/l	0.30
51218-45-2	Metolachlor	< 5.0 ug/l	5.0
21087-64-9	Metribuzin	< 2.0 ug/l	2.0
122-34-9	Simazine	< 0.40 ug/l	0.40

EPA Method	Analyst	Prep Date	Analysis Date
508	RDK	6/6/2005	6/9/2005

CAS Number	Parameter	Result	Report Limit
309-00-2	Aldrin	< 30 ug/l	30
58-89-9	gamma-BHC (Lindane)	< 0.02 ug/l	0.02
57-74-9	Chlordane(Total)	< 0.20 ug/l	0.20
60-57-1	Dieldrin	< 20 ug/l	20
72-20-8	Endrin	< 0.20 ug/l	0.20
76-44-8	Heptachlor	< 0.04 ug/l	0.04
1024-57-3	Heptachlor epoxide	< 0.02 ug/l	0.02
118-74-1	Hexachlorobenzene	< 0.10 ug/l	0.10
77-47-4	Hexachlorocyclopentadiene	< 5.0 ug/l	5.0
72-43-5	Methoxychlor	< 4.0 ug/l	4.0
	Total PCB	< 0.50 ug/l	0.50
8001-35-2	Toxaphene	< 1.0 ug/l	1.0

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- CERTIFICATE OF ANALYSIS -

EPA Method	Analyst	Prep Date	Analysis Date
515.1	AFK	6/7/2005	6/11/2005

CAS Number	Parameter	Result	Report Limit
75-99-0	Dalapon	< 20 ug/l	20
1918-00-9	Dicamba	< 10 ug/l	10
94-75-7	2,4-Dichlorophenoxyacetic acid (2,4-D)	< 7.0 ug/l	7.0
88-85-7	Dinoseb	< 0.70 ug/l	0.70
87-86-5	Pentachlorophenol	< 0.10 ug/l	0.10
1918-02-1	Picloram	< 50 ug/l	50
93-72-1	Silvex	< 5.0 ug/l	5.0

EPA Method	Analyst	Prep Date	Analysis Date
1.1	TAG		6/10/2005

CAS Number	Parameter	Result	Report Limit
	CCV recovery for oxamyl was above method acceptance limits. LFB recoveries for propoxur and methiocarb were above method acceptance limits. The target analytes were not detected in sample.		
116-06-3	Aldicarb	< 0.7 ug/l	0.7
1646-88-4	Aldicarb sulfone	< 0.7 ug/l	0.7
1646-87-3	Aldicarb sulfoxide	< 0.7 ug/l	0.7
63-25-2	Carbaryl	< 10 ug/l	10
1563-66-2	Carbofuran	< 4.0 ug/l	4.0
16655-82-6	3-Hydroxycarbofuran	< 10 ug/l	10
16752-77-5	Methomyl	< 50 ug/l	50
23135-22-0	Oxamyl	< 20 ug/l	20

--- Surrogate Recoveries ---

QC Lab#	EPA Method	Surrogate Name	Percent Recovery	Lower Limit	Upper Limit
MEL05-02886	507	DMNB (Surr)	84 %R	70	130
MEL05-02886	508	Decachlorobiphenyl (Surr)	101 %R	70	130
MEL05-02886	515.1	DCAA (Surr)	128 %R	70	130

End of Report

Report Approved By: Todd M. Brown

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Aqua Tech Environmental Laboratories, Inc.

- CERTIFICATE OF ANALYSIS -

Client #: I0043
Wil Research Laboratories
1407 George Road
Ashland, OH 44805

Report Date: *15-Jun-05*

Phone: (419) 289-8700 **Ext:**
FAX: (419) 289-3650

Attn: Lisa Snyder DVM

Our Lab #: MAR05-08334
Date Logged-In: 6/3/05
Sample Type: Water
Project #:

Your Sample ID: B-78
Sample Source: Other/Undefined
Client Project #: 2005 Annual
Date Submitted to Lab: 6/3/2005 **PO#:** 24977

- COLLECTION INFORMATION -

Date/Time/By: 6/2/05 11:48 AM J.T. Simpson

EPA Method	Analyst	Analysis Date	Parameter	Result	Units	PQL
200.8	ROH	6/6/05	Arsenic, As	< 3.0	µg/L	3.0
200.8	ROH	6/6/05	Barium, Ba	< 10	µg/L	10
200.8	ROH	6/6/05	Cadmium, Cd	< 0.5	µg/L	0.5
200.7	RJA	6/8/05	Chromium, Cr	< 20	µg/L	20
200.7	RJA	6/8/05	Copper, Cu	< 10	µg/L	10
SM 4500F-C	LGE	6/7/05	Fluoride, F, Dissolved	< 0.10	mg/L	0.10
200.8	ROH	6/6/05	Lead, Pb	< 2.0	µg/L	2.0
245.2	RJA	6/8/05	Mercury, Hg	< 0.2	µg/L	0.2
200.8	ROH	6/6/05	Nickel, Ni	< 10	µg/L	10
SM4500-NO3-F	TLL	6/7/05	Nitrogen, Nitrate + Nitrite (as N)	< 0.05	mg/L	0.05
200.8	ROH	6/6/05	Selenium, Se	< 3.0	µg/L	3.0
200.7	RJA	6/8/05	Silver, Ag	< 20	µg/L	20
200.7	RJA	6/8/05	Sodium, Na	0.7	mg/L	0.4
200.7	RJA	6/8/05	Zinc, Zn	< 10	µg/L	10

End of Report

Report Approved By: Deborah K. Johnson

Deborah K. Johnson

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Aqua Tech Environmental Laboratories, Inc.

- CERTIFICATE OF ANALYSIS -

Client #: I0043 **Report Date:** *15-Jun-05*

Wil Research Laboratories
1407 George Road
Ashland, OH 44805

Phone: (419) 289-8700 **Ext:**
FAX: (419) 289-3650

Attn: Lisa Snyder DVM

Our Lab#: MAR05-08343 **Your Sample ID:** B-78
Date Logged In: 6/3/05 **Sample Source:** Other/Undefined
Sample Type: Water **Client Project #:** 2005 Annual
Project #: **Date Submitted to Lab:** 6/3/2005 **PO#:** 24977

- COLLECTION INFORMATION -

Date/Time/By: 6/2/05 11:48 AM J.T. Simpson

EPA Method	Analyst	Prep Date	Analysis Date
524.2	SLC		6/10/05

CAS Number	Parameter	Result	PQL
71-43-2	Benzene	< 0.5 ug/l	0.5
75-25-2	Bromoform	< 0.5 ug/l	0.5
75-27-4	Bromodichloromethane	3.1 ug/l	0.5
56-23-5	Carbon tetrachloride	< 0.5 ug/l	0.5
108-90-7	Chlorobenzene	< 0.5 ug/l	0.5
67-66-3	Chloroform	8.7 ug/l	0.5
124-48-1	Dibromochloromethane	< 0.5 ug/l	0.5
95-50-1	1,2-Dichlorobenzene	< 0.5 ug/l	0.5
106-46-7	1,4-Dichlorobenzene	< 0.5 ug/l	0.5
107-06-2	1,2-Dichloroethane	< 0.5 ug/l	0.5
75-35-4	1,1-Dichloroethene	< 0.5 ug/l	0.5
156-59-2	cis-1,2-Dichloroethene	< 0.5 ug/l	0.5
156-60-5	trans-1,2-Dichloroethene	< 0.5 ug/l	0.5
78-87-5	1,2-Dichloropropane	< 0.5 ug/l	0.5
100-41-4	Ethylbenzene	< 0.5 ug/l	0.5
75-09-2	Methylene chloride	< 0.5 ug/l	0.5
100-42-5	Styrene	< 0.5 ug/l	0.5
127-18-4	Tetrachloroethene	< 0.5 ug/l	0.5
108-88-3	Toluene	< 0.5 ug/l	0.5
71-55-6	1,1,1-Trichloroethane	< 0.5 ug/l	0.5
79-00-5	1,1,2-Trichloroethane	< 0.5 ug/l	0.5

Your Sample ID: B-78 *Lab Number MAR05-08343*

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- CERTIFICATE OF ANALYSIS -

CAS Number	Parameter	Result	Typical Report Limit
79-01-6	Trichloroethene	< 0.5 ug/l	0.5
95-47-6	o-Xylene	< 0.5 ug/l	0.5
120-82-1	1,2,4-Trichlorobenzene	< 0.5 ug/l	0.5
75-01-4	Vinyl chloride	< 0.5 ug/l	0.5
108383/106	m&p Xylenes	< 1.0 ug/l	1
	Xylene, Total	< 1.5 ug/l	1.5

--- Surrogate Recoveries ---

QC Lab#	EPA Method	Surrogate Name	Percent Recovery	Lower Limit	Upper Limit
MAR05-08343	524.2	1,2-Dichlorobenzene-d4 (Surr)	108 %R	70	130
MAR05-08343	524.2	Bromofluorobenzene (BFB) (Surr)	101 %R	70	130

End of Report

Report Approved By: MICHAEL HERDLICK

Your Sample ID: B-78

Lab Number MAR05-08343

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LTS 6/24/05

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Aqua Tech Environmental Laboratories, Inc.

- CERTIFICATE OF ANALYSIS -

Client #: I0043
Wil Research Laboratories
1407 Montgomery Twp #805
Ashland, OH 44805
Attn: Lisa Snyder

Report Date: *20-Jun-05*
Total Number of Pages: 2

Phone: (419) 289-8700 **Ext:**
FAX: (419) 289-3650

Our Lab#: MEL05-02887 **Your Sample ID:** B-78
Date Logged In: 6/3/05 **Sample Source:** Drinking Water
Sample Type: Water **Client Project #:**
Project #: **Date Submitted to Lab:** 6/3/2005 **PO#:** 24977

- COLLECTION INFORMATION -

Date/Time/By: 6/2/2005 11:48 AM Joe Tate Simpson

EPA Method	Analyst	Prep Date	Analysis Date
507	TMH	6/6/2005	6/9/2005

CAS Number	Parameter	Result	Report Limit
15972-60-8	Alachlor	< 0.20 ug/l	0.20
1912-24-9	Atrazine	< 0.30 ug/l	0.30
51218-45-2	Metolachlor	< 5.0 ug/l	5.0
21087-64-9	Metribuzin	< 2.0 ug/l	2.0
122-34-9	Simazine	< 0.40 ug/l	0.40

EPA Method	Analyst	Prep Date	Analysis Date
508	RDK	6/6/2005	6/9/2005

CAS Number	Parameter	Result	Report Limit
309-00-2	Aldrin	< 30 ug/l	30
58-89-9	gamma-BHC (Lindane)	< 0.02 ug/l	0.02
57-74-9	Chlordane(Total)	< 0.20 ug/l	0.20
60-57-1	Dieldrin	< 20 ug/l	20
72-20-8	Endrin	< 0.20 ug/l	0.20
76-44-8	Heptachlor	< 0.04 ug/l	0.04
1024-57-3	Heptachlor epoxide	< 0.02 ug/l	0.02
118-74-1	Hexachlorobenzene	< 0.10 ug/l	0.10
77-47-4	Hexachlorocyclopentadiene	< 5.0 ug/l	5.0
72-43-5	Methoxychlor	< 4.0 ug/l	4.0
	Total PCB	< 0.50 ug/l	0.50
8001-35-2	Toxaphene	< 1.0 ug/l	1.0

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CTS 6/24/05

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Aqua Tech Environmental Laboratories, Inc.

- CERTIFICATE OF ANALYSIS -

EPA Method	Analyst	Prep Date	Analysis Date
515.1	AFK	6/7/2005	6/11/2005

CAS Number	Parameter	Result	Report Limit
75-99-0	Dalapon	< 20 ug/l	20
1918-00-9	Dicamba	< 10 ug/l	10
94-75-7	2,4-Dichlorophenoxyacetic acid (2,4-D)	< 7.0 ug/l	7.0
88-85-7	Dinoseb	< 0.70 ug/l	0.70
87-86-5	Pentachlorophenol	< 0.10 ug/l	0.10
1918-02-1	Picloram	< 50 ug/l	50
93-72-1	Silvex	< 5.0 ug/l	5.0

EPA Method	Analyst	Prep Date	Analysis Date
531.1	TAG		6/10/2005

CAS Number	Parameter	Result	Report Limit
	CCV recovery for oxamyl was above method acceptance limits. LFB recoveries for propoxur and methiocarb were above method acceptance limits. The target analytes were not detected in sample.		
116-06-3	Aldicarb	< 0.7 ug/l	0.7
1646-88-4	Aldicarb sulfone	< 0.7 ug/l	0.7
1646-87-3	Aldicarb sulfoxide	< 0.7 ug/l	0.7
63-25-2	Carbaryl	< 10 ug/l	10
1563-66-2	Carbofuran	< 4.0 ug/l	4.0
16655-82-6	3-Hydroxycarbofuran	< 10 ug/l	10
16752-77-5	Methomyl	< 50 ug/l	50
23135-22-0	Oxamyl	< 20 ug/l	20

--- Surrogate Recoveries ---

QC Lab#	EPA Method	Surrogate Name	Percent Recovery	Lower Limit	Upper Limit
MEL05-02887	507	DMNB (Surr)	84 %R	70	130
MEL05-02887	508	Decachlorobiphenyl (Surr)	116 %R	70	130
MEL05-02887	515.1	DCAA (Surr)	118 %R	70	130

End of Report

Report Approved By: Todd M. Brown

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APPENDIX E

Animal Room Environmental Conditions

PROJECT NO.:WIL- 431014 TEMPERATURE/HUMIDITY - DAILY SUMMARY REPORT BY STUDY
SPONSOR: BATTELLE

STUDY SPECIFICATIONS: 431014 DATE IN: 10/18/05 TIME IN: 11:00
DATE OUT: 11/09/05 TIME OUT: 11:00

ROOM SPECIFICATIONS: B ROOM 67 LOW TEMPERATURE ºF: 66.0 HIGH TEMPERATURE ºF: 76.0 LOW HUMIDITY: 30.0
SPECIES: RAT LOW TEMPERATURE ºC: 18.9 HIGH TEMPERATURE ºC: 24.4 HIGH HUMIDITY: 70.0

	TEMPERATURE		HUMIDITY
DATE	MEAN (ºF)	MEAN (ºC)	MEAN (%RH)
18-Oct-05	70.4	21.3	53.3
19-Oct-05	70.4	21.4	53.5
20-Oct-05	70.5	21.4	47.4
21-Oct-05	70.5	21.4	52.7
22-Oct-05	70.4	21.4	55.8
23-Oct-05	70.5	21.4	43.8
24-Oct-05	70.4	21.3	48.0
25-Oct-05	70.5	21.4	48.5
26-Oct-05	70.5	21.4	42.9
27-Oct-05	70.4	21.3	39.3
28-Oct-05	70.4	21.3	46.5
29-Oct-05	70.4	21.4	55.5
30-Oct-05	70.4	21.3	55.5
31-Oct-05	70.5	21.4	55.0
01-Nov-05	70.5	21.4	54.6
02-Nov-05	70.6	21.4	54.2
03-Nov-05	71.3	21.9	47.9
04-Nov-05	70.5	21.4	54.3
05-Nov-05	70.4	21.4	56.3
06-Nov-05	70.5	21.4	54.0
07-Nov-05	70.5	21.4	51.9
08-Nov-05	70.5	21.4	52.6
09-Nov-05	70.4	21.4	56.1

NOTE: + = VALUE WAS GREATER THAN HIGH RANGE
- = VALUE WAS LESS THAN LOW RANGE
NOTE: MEANS REPRESENT THE MEAN OF THE DAILY VALUES

REPORT 4
VERSION 1.09
11/9/05 14:44

STUDY SPECIFICATIONS: 431014 DATE IN: 10/18/05 TIME IN: 11:00
DATE OUT: 11/09/05 TIME OUT: 11:00

ROOM SPECIFICATIONS: B ROOM 67 LOW TEMPERATURE ºF: 66.0 HIGH TEMPERATURE ºF: 76.0 LOW HUMIDITY: 30.0
SPECIES: RAT LOW TEMPERATURE ºC: 18.9 HIGH TEMPERATURE ºC: 24.4 HIGH HUMIDITY: 70.0

	TEMPERATURE		HUMIDITY
DATE	MEAN (ºF)	MEAN (ºC)	MEAN (%RH)

GRAND STATS	MEAN	MIN	MAX
TEMPERATURE ºF	70.5	70.4	71.3
TEMPERATURE ºC	21.4	21.3	21.9
HUMIDITY (%RH)	51.3	39.3	56.3
N DAYS	23		

NOTE: + = VALUE WAS GREATER THAN HIGH RANGE
\- = VALUE WAS LESS THAN LOW RANGE
NOTE: MEANS REPRESENT THE MEAN OF THE DAILY VALUES

ROOM SPECIFICATIONS:	B ROOM 67		
SPECIES:	RAT		
LOW TEMPERATURE:	66.0	DATE IN:	10/18/05
HIGH TEMPERATURE:	76.0	TIME IN:	11:00
LOW HUMIDITY:	30.0	DATE OUT:	11/09/05
HIGH HUMIDITY:	70.0	TIME OUT:	11:00

ROOM B ROOM 67 SUMMARY

	TEMPERATURE	HUMIDITY
MEAN	70.5	51.2
MIN	69.0	33.4
MAX	74.3	78.5
SD	0.47	6.12
N SAMPLES	525	525
FIRST DAY	10/18/05	
LAST DAY	11/09/05	
N DAYS	23	

NOTE: TEMPERATURE UNITS = DEGREES FAHRENHEIT
HUMIDITY UNITS = % RELATIVE HUMIDITY
NOTE: MEANS REPRESENT THE MEAN OF ALL VALUES

STUDY 431014 SUMMARY

MEAN	70.5	51.2
MIN	69.0	33.4
MAX	74.3	78.5
SD	0.47	6.12
N SAMPLES	525	525
FIRST DAY	10/18/05	
LAST DAY	11/09/05	
N DAYS	23	

NOTE: TEMPERATURE UNITS = DEGREES FAHRENHEIT
HUMIDITY UNITS = % RELATIVE HUMIDITY
NOTE: MEANS REPRESENT THE MEAN OF ALL VALUES

APPENDIX F

Hormone Analyses Methods, Procedures, Performance and References

Serum Chemistry – DPC Gamma C-12 Gamma Counter System

Radioimmunoassay

Testosterone – The ^{125}I radioimmunoassay system used for the quantitative determination of testosterone was the Coat-A-Count® Total Testosterone Assay from Diagnostic Products Corporation. This assay system used T-specific antibody-coated tubes and the procedures listed in the package insert were followed. All unknown samples and controls were within the standard curve range of concentration (20 to 1600 ng/dL) and percent binding (85.2 to 14.4). Kit controls were purchased from DPC (Con 4, Con 5 and Con 6) and run in the assay at the manufacturer's recommended concentrations. Quality control testosterone from Sigma-Aldrich was solubilized with methanol and diluted with the kit-supplied Zero Standard (total diluted volume contained ≤ 1% solvent). Intra- and inter-assay variability of the assay kit controls (based on cpm) was ≤ 4.4%, whereas the intra- and inter-assay variability of the assay QC controls (based on cpm) was ≤14.3% and 36.1%, respectively. The kit control results were generally within 10% of expected (except one run of the 417 ng/dL concentration). The percent recovery of the QC testosterone samples were not as expected. Our laboratory does not routinely use these non-kit QCs, so it is uncertain why the data from these non-kit QCs were inaccurate. Since the values of the kit controls were reasonable and the variability across controls was low, the assay run was considered acceptable.

See text table below for additional details on the assay standards, controls, coefficients of variance, binding and percent recovery of controls.

Testosterone RIA performance

Standard Curve					
ng/dL	20[a]	100	400	800	1600
Range of % binding[b]	84.0-85.2	55.9-59.9	29.6-33.8	20.8-22.9	14.4-15.4

Assay Controls							
	Intra-assay CV[c]		Range of % binding[b]		Mean % recovery[d]		Inter-assay CV[e]
	Run 1	Run 2	Run 1	Run 2	Run 1	Run 2	
Kit Control 1 (110 ng/dL)[f]	0.6	1.8	59.5-60.0	53.5-55.0	91.3	98.3	4.4
Kit Control 2 (417 ng/dL)[f]	2.3	2.1	28.7-29.8	27.4-28.3	126.2	109.5	1.2
Kit Control 3 (733 ng/dL)[f]	2.6	4.4	22.9-23.9	21.1-22.6	107.6	98.6	2.3
Low QC (100 ng/dL)[g]	14.3	6.3	26.3-32.9	47.9-52.6	530.6	132.3	36.1
High QC (800 ng/dL)[g]	4.4	2.3	19.3-20.8	22.7-23.5	128.6	81.2	10.7

a- This is the lower limit of sensitivity of this specific assay. According to WIL standard operating procedures, unknown samples below this value are reported as one-half of this value.
b- $\%B/B_0$ range between assays
c- Based on duplicate counts per minute (cpm)
d- (observed/expected) X 100 (based on calculated mean concentrations from all assays)
e- Based on mean cpm between assays
f- Kit controls are Con 4, 5 and 6 respectively (CP #05-155) purchased from DPC.
g- Testosterone purchased from Sigma-Aldrich (Catalog #T 1500).

Rat Luteinizing Hormone (rLH) –The ^{125}I radioimmunoassay system for the quantitative determination of (rLH) was the Biotrak™ rat luteinizing hormone [^{125}I] assay system© with separation by centrifugation (Amersham Life Science Ltd). This assay system used the procedures listed in the package insert. Eight, 6, 10, 10, 9, 10 and 6 of the unknown samples in the control, 50, 100, 150 mg/kg/day linuron and 25, 50, 100 mg/kg/day phenobarbital groups, respectively, were below the limit of sensitivity of this assay. The rest of the unknown samples were read within the standard curve range of concentration (0.8 to 50 ng/mL) and percent binding (97.1 to 12.2). Although more than half of the unknowns were below the lower limit of sensitivity, this was not considered to impact interpretation of the study results since levels of hormone this low in adult male rats were not considered to be biologically relevant. Kit controls were separate dilutions of the kit standards and run in the assay at the concentrations spanning the low and high range of the standard curve itself. Quality control rLH purchased from the National Hormone and Pituitary Program (NHPP) at the National Institute of Diabetes and Digestive and Kidney Diseases (NIDDKD) was diluted with kit assay buffer. The protocol-specified target of 70 and 30%B/B_0 for the QCs were calculated incorrectly such that the concentration of these control samples were 10-fold lower than they should have been (see deviations page). Intra-assay variability of all assay controls (based on cpm) was ≤ 3.2% (no inter-assay variability since only one assay was performed). The mean percent recovery of the higher concentration kit control was 91.3%, and the mean percent recovery of the higher concentration QC sample was 72.0%.

See text table below for additional details on the assay standards, controls, coefficients of variance, binding and percent recovery of controls.

rLH RIA performance

Standard Curve							
ng/mL	0.8[a]	1.6	3.1	6.2	12.5	25	50
Mean % binding[b]	97.1	92.6	81.3	62.5	41.2	23.3	12.2

Assay Controls				
	Intra-assay CV[c]	Range of % binding[d]	Mean % recovery[e]	Inter-assay CV
Kit Control 1(1.2 ng/mL)[f]	3.2	95.5-100.2	Off curve	NA
Kit Control 2 (33.3 ng/mL)[f]	3.2	18.8-20.0	91.3	NA
Low QC (0.6 ng/mL)[g,h]	1.8	96.3-98.8	Off curve	NA
High QC (2.5 ng/mL)[g,h]	1.5	89.4-91.4	72.0	NA

a- This is the lower limit of sensitivity of this specific assay. According to WIL standard operating procedures, unknown samples below this value are reported as one-half of this value.
b- $\%B/B_0$
c- Based on duplicate counts per minute (cpm)
d- $\%B/B_0$ range for all tubes on all assays
e- (observed/expected) X 100 (based on calculated mean concentrations)
f- Kit controls are targeted concentrations obtained as dilutions of the kit standard.
g- rLH purchased from Dr. Parlow at NHPP-NIDDKD.
h- The mathematical calculation of what concentration to use was done in error (see deviations page)
NA- Not applicable as only one assay was conducted for this hormone

Rat Thyroid Stimulating Hormone (rTSH) – The ^{125}I radioimmunoassay system for the quantitative measurement of rTSH was the Biotrak™ rat thyroid stimulating hormone ^{125}I assay system utilizing magnetic separation (Amersham Pharmacia Biotech). This assay system used the procedures listed in the package insert. All unknown samples read within the standard curve range of concentration (2.0 to 64 ng/mL) and percent binding (89.9 to 13.5). Kit controls were separate dilutions of the kit standards and run in the assay at the concentrations spanning the low and high range of the standard curve itself. Quality control rTSH purchased from the National Hormone and Pituitary Program (NHPP) at the National Institute of Diabetes and Digestive and Kidney Diseases (NIDDKD) was diluted with kit assay buffer. The protocol-specified target of 70 and 30%B/B_0 for the QCs was calculated incorrectly such that the concentration of these control samples were 10-fold lower than they should have been (see deviations page). Intra-assay variability of the assay controls (based on cpm) was ≤ 6.6% (no inter-assay variability since only one assay was performed). The mean percent recovery of the kit controls were 78.1 and 100%, and the mean percent recovery of the higher concentration QC sample was 118.8%.

See text table below for additional details on the assay standards, controls, coefficients of variance, binding and percent recovery of controls.

rTSH RIA performance						
Standard Curve						
ng/mL	2.0[a]	4.0	8.0	16.0	32.0	64.0
Mean % binding[b]	90.0	73.9	60.7	42.5	28.1	13.5
Assay Controls						
	Intra-assay CV[c]	Range of % binding[d]		Mean % recovery[e]	Inter-assay CV	
Kit Control 1(3.2 ng/mL)[f]	0.6	83.8-84.6		78.1	NA	
Kit Control 2 (41.8 ng/mL)[f]	6.6	19.7-23.4		100	NA	
Low QC (0.4 ng/mL)[g,h]	2.3	96.1-92.5		Off curve	NA	
High QC (1.6 ng/mL)[g,h]	2.1	86.2-89.3		118.8[i]	NA	

a- This is the lower limit of sensitivity of this specific assay. According to WIL standard operating procedures, unknown samples below this value are reported as one-half of this value.
b- $\%B/B_0$
c- Based on duplicate counts per minute (cpm)
d- $\%B/B_0$ range for all tubes on all assays
e- (observed/expected) X 100 (based on calculated mean concentrations)
f- Kit controls are targeted concentrations obtained as dilutions of the kit standard.
g- rTSH purchased from Dr. Parlow at NHPP-NIDDKD.
h- The mathematical calculation of what concentration to use was done in error (see deviations page)
i- Not considered off curve since the percent binding for these QC samples were actually within the percent binding of the standard curve.
NA- Not applicable as only one assay was conducted for this hormone

Thyroxine (T_4) - The ^{125}I radioimmunoassay system used for the quantitative determination of T_4 was the Coat-A-Count® Total T_4 Assay from Diagnostic Products Corporation. This assay system used T_4-specific antibody-coated tubes and the procedures listed in the package insert were followed. All unknown samples and controls were read within the standard curve range of concentration (0.1 to 24.0 µg/dL) and percent binding (88.3 to 22.7). Kit controls were purchased from DPC (Con 4, Con 5 and Con 6) and run in the assay at the manufacturer's recommended concentrations. Quality control T_4 from Sigma-Aldrich was solubilized with methanol and diluted with the kit-supplied Zero Standard (total diluted volume contained ≤ 1% solvent). Intra-assay variability of the assay controls (based on cpm) was ≤ 4.5% (no inter-assay variability since only one assay was performed). The kit control results were generally within 7% of expected, except for the low concentration controls of 2.6 and 4.0 µg/dL which had only 53.8 and 22.5% recovery. This low end of the standard curve is the range where the unknown samples were, so it is uncertain the impact this has on determining the accuracy of the unknown sample absolute values, although since this appeared to be consistent (likely impacted the samples from control and treated animals similarly), the relative hormone values were still considered to be useful for interpretation.

See text table below for additional details on the assay standards, controls, coefficients of variance, binding and percent recovery of controls.

T_4 RIA performance

Standard Curve					
µg/dL	0.1[a]	4.0	10.0	16.0	24.0
Mean % binding[b]	88.3	61.0	39.9	30.2	22.7

Assay Controls				
	Intra-assay CV[c]	Range of % binding[d]	Mean % recovery[e]	Inter-assay CV
Kit Control 1 (2.6 µg/dL)[f]	1.6	72.3-74.0	53.8	NA
Kit Control 2 (7.7 µg/dL)[f]	0.6	45.1-45.4	106.5	NA
Kit Control 3 (11.9 µg/dL)[f]	4.3	34.9-37.2	105.9	NA
Low QC (4.0 µg/dL)[g]	4.5	74.9-80.0	22.5	NA
High QC (16.0 µg/dL)[g]	3.5	30.0-31.7	99.4	NA

a- This is the lower limit of sensitivity of this specific assay. According to WIL standard operating procedures, unknown samples below this value are reported as one-half of this value.
b- $\%B/B_0$
c- Based on duplicate counts per minute (cpm)
d- $\%B/B_0$ range for all tubes on all assays
e- (observed/expected) X 100 (based on calculated mean concentrations)
f- Kit controls are Con 4, 5 and 6 respectively (CP #05-155) purchased from DPC.
g- T_4 purchased from Sigma-Aldrich (Catalog #T 2376).
NA- Not applicable as only one assay was conducted for this hormone

Triiodothyronine (T_3) - The ^{125}I radioimmunoassay system used for the quantitative determination of T_3 was the Coat-A-Count® Total T_3 Assay from Diagnostic Products Corporation. This assay system used T_3-specific antibody-coated tubes and the procedures listed in the package insert were followed. All unknown samples and controls were read within the standard curve range of concentration (20 to 600 ng/dL) and percent binding (94.1 to 19.1). Kit controls were purchased from DPC (Con 4, Con 5 and Con 6) and run in the assay at the manufacturer's recommended concentrations. Quality control T_3 from Sigma-Aldrich was solubilized with methanol and diluted with the kit-supplied Zero Standard (total diluted volume contained ≤ 1% solvent). Intra-assay variability of the assay controls (based on cpm) was ≤ 6.4% (no inter-assay variability since only one assay was performed). The kit control results were within 10% of expected. The percent recovery of the QC T_3 samples were lower than expected. Our laboratory does not routinely use these non-kit QCs, so it is uncertain why the data from these non-kit QCs were unexpectedly low. Since the values of the kit controls were reasonable, the assay run was considered acceptable.

See text table below for additional details on the assay standards, controls, coefficients of variance, binding and percent recovery of controls.

T_3 RIA performance					
Standard Curve					
ng/dL	20[a]	50	100	200	600
Mean % binding[b]	94.1	79.5	60.5	42.1	19.1
Assay Controls					
	Intra-assay CV[c]	Range of % binding[d]	Mean % recovery[e]	Inter-assay CV	
Kit Control 1(74 ng/dL)[f]	1.5	70.3-71.9	96.6	NA	
Kit Control 2 (153 ng/dL)[f]	2.2	50.7-52.5	91.6	NA	
Kit Control 3 (235 ng/dL)[f]	0.1	38.8-38.8	93.9	NA	
Low QC (50 ng/dL)[g]	6.4	84.0-92.4	61.8	NA	
High QC (200 ng/dL)[g]	0.2	82.8-83.1	21.3	NA	

a- This is the lower limit of sensitivity of this specific assay. According to WIL standard operating procedures, unknown samples below this value are reported as one-half of this value.
b- $\%B/B_0$
c- Based on duplicate counts per minute (cpm)
d- $\%B/B_0$ range for all tubes on all assays
e- (observed/expected) X 100 (based on calculated mean concentrations)
f- Kit controls are Con 4, 5 and 6 respectively (CP #05-155) purchased from DPC.
g- T_3 purchased from Sigma-Aldrich (Catalog #91990).
NA- Not applicable as only one assay was conducted for this hormone

Rat Follicle Stimulating Hormone (rFSH) –The ^{125}I radioimmunoassay system for the quantitative determination of rFSH was the Biotrak™ rat follicle stimulating hormone [^{125}I] assay system© with magnetic separation (Amersham Life Science Ltd). This assay system used the procedures listed in the package insert. All unknown samples were read within the standard curve range of concentration (3.1 to 100 ng/mL) and percent binding (100.2 to 19.3). Kit controls were separate dilutions of the kit standards and run in the assay at the concentrations spanning the low and high range of the standard curve itself. Quality control rFSH purchased from the National Hormone and Pituitary Program (NHPP) at the National Institute of Diabetes and Digestive and Kidney Diseases (NIDDKD) was diluted with kit assay buffer. The protocol-specified target of 70 and 30%B/B_0 for the QCs were calculated incorrectly such that the concentration of these control samples were 10-fold lower than they should have been (see deviations page). Generally, intra-assay variability of the assay controls (based on cpm) was ≤ 2.6% (no inter-assay variability since only one assay was performed). The percent recovery of the controls were not as expected, however they were consistent as evidenced by the low coefficient of variation. The impact of the unexpected percent recovery results on determining the accuracy of the unknown sample absolute values is uncertain, however since the variability appeared to be consistent (likely impact on samples from control and treated animals would be similar) relative hormone values were still considered useful for interpretation.

See text table below for additional details on the assay standards, controls, coefficients of variance, binding and percent recovery of controls.

rFSH RIA performance

Standard Curve						
ng/mL	3.1[a]	6.2	12.5	25.0	50.0	100
Mean % binding[b]	100.2	89.6	69.2	49.8	30.3	19.3

Assay Controls				
	Intra-assay CV[c]	Range of % binding[d]	Mean % recovery[e]	Inter-assay CV
Kit Control 1(4.8 ng/mL)[f]	0.1	97.4-97.6	41.7	NA
Kit Control 2 (61 ng/mL)[f]	0.9	23.7-24.1	117.5	NA
Low QC (0.6 ng/mL)[g,h]	0.9	102.6-104.0	Off curve	NA
High QC (5.0 ng/mL)[g,h]	2.6	79.5-82.8	172.0	NA

a- This is the lower limit of sensitivity of this specific assay. According to WIL standard operating procedures, unknown samples below this value are reported as one-half of this value.
b- $\%B/B_0$
c- Based on duplicate counts per minute (cpm)
d- $\%B/B_0$ range for all tubes on all assays
e- (observed/expected) X 100 (based on calculated mean concentrations)
f- Kit controls are targeted concentrations obtained as dilutions of the kit standard.
g- rFSH purchased from Dr. Parlow at NHPP-NIDDKD.
h- The mathematical calculation of what concentration to use was done in error (see deviations page)
NA- Not applicable as only one assay was conducted for this hormone

Estradiol - The ^{125}I radioimmunoassay system used for the quantitative determination of estradiol was the Estradiol Radioimmunoassay from Diagnostic Systems Laboratories. The procedures listed in the package insert were followed. Except for 1 sample in the 25 mg/kg/day phenobarbital group that was below the lower limit of sensitivity, all unknown samples and controls were read within the standard curve range of concentration (20 to 6000 pg/dL) and percent binding (89.3 to 6.4). Kit controls were separate dilutions of the kit standards and run in the assay at the concentrations spanning the low and high range of the standard curve itself. Quality control estradiol from Sigma-Aldrich was solubilized with methanol and diluted with the kit-supplied Zero Standard (total diluted volume contained ≤ 1% solvent). Intra-assay variability of the assay kit controls (based on cpm) was ≤ 2.3%, where the intra-assay variability of the two assay QC controls (based on cpm) was 6.9% and 27.4% (no inter-assay variability since only one assay was performed). The kit control results were within 2% of expected, whereas the percent recovery of the QC estradiol samples were not as expected. Our laboratory does not routinely use these non-kit QCs, so it is uncertain why the data from these non-kit QCs were inconsistent and unexpected. Since the values and coefficient of variance of the kit controls were reasonable, the assay run was considered acceptable.

Values obtained from the original analyses for animal nos. 97122 and 97124 in the 50 mg/kg/day linuron group, 97207 in the 150 mg/kg/day linuron group and 97123 in the 50 mg/kg/day phenobarbital group were highly variable, having a percent coefficient of variation greater than 15. Therefore, samples from these animals were reassayed. However, the results of the assay could not be calculated because the standard curve did not meet criteria for acceptability, and “result unobtainable” was entered for these animals.

See text table below for additional details on the assay standards, controls, coefficients of variance, binding and percent recovery of controls.

Estradiol RIA performance						
Standard Curve						
pg/mL	20[a]	50	250	750	2000	6000
Mean % binding[b]	89.3	69.2	40.0	19.0	11.3	6.4
Assay Controls						
	Intra-assay CV[c]	Range of % binding[d]		Mean % recovery[e]	Inter-assay CV	
Kit Control 1 (250 pg/mL)[f]	1.1	36.7-37.3		100.7	NA	
Kit Control 2 (1000 pg/mL)[f]	2.3	17.0-17.6		98.9	NA	
Low QC (50 pg/mL)[g]	6.9	56.2-62.2		174.8	NA	
High QC (750 pg/mL)[g]	27.4	18.3-28.0		88.4	NA	

a- This is the lower limit of sensitivity of this specific assay. According to WIL standard operating procedures, unknown samples below this value are reported as one-half of this value.
b- $\%B/B_0$
c- Based on duplicate counts per minute (cpm)
d- $\%B/B_0$ range for all tubes on all assays
e- (observed/expected) X 100 (based on calculated mean concentrations)
f- Kit controls are targeted concentrations obtained as dilutions of the kit standard.
g- Estradiol purchased from Sigma-Aldrich (Catalog #E 1024).
NA- Not applicable as only one assay was conducted for this hormone

Rat Prolactin (rPRL) - The ^{125}I radioimmunoassay system for the quantitative determination of rPRL was the Biotrak™ rat prolactin [^{125}I] assay system© (Amersham Life Science Ltd). This assay system were conducted following the procedures listed in the package insert. Except for 1 sample in each of the 50 and 150 mg/kg/day linuron groups that was below the lower limit of sensitivity, all unknown samples were read within the standard curve range of concentration (0.8 to 50 ng/mL) and percent binding (96.4 to 16.0). Kit controls were separate dilutions of the kit standards and run in the assay at the concentrations spanning the low and high range of the standard curve itself. Quality control rPRL purchased from the National Hormone and Pituitary Program (NHPP) at the National Institute of Diabetes and Digestive and Kidney Diseases (NIDDKD) was diluted with kit assay buffer. The protocol-specified target of 70 and 30%B/B_0 for the QCs were calculated incorrectly such that the concentration of these control samples were 10-fold lower than they should have been (see deviations page). Intra- and inter-assay variability of the assay kit controls (based on cpm) was ≤ 3.1 and 15.7%, respectively. The intra- and inter-assay variability of the assay QC controls (based on cpm) was ≤5.3% and 19.9%, respectively. The kit control results were generally within 15% of expected. The percent recovery of the QC rPRL samples were not as expected. Our laboratory does not routinely use these non-kit QCs, so it is uncertain why the data from these non-kit QCs were inconsistent and unexpected. Since the values of the kit controls were reasonable and the coefficient of variance was low across controls, the assay run was considered acceptable.

In the first analysis, serum samples of 50 µL were assayed, and a majority of the resulting values from this original analysis were below the lowest value in the standard curve. Because there were not enough kit materials to reassay all samples with low values, a subset these samples were then reassayed on 28 November 2005 using 100 µL of serum and kit materials that expired on 23 November 2005. "Result unobtainable" was entered for samples that were not reassayed.

See text table below for additional details on the assay standards, controls, coefficients of variance, binding and percent recovery of controls.

rPRL RIA performance

Standard Curve							
ng/mL	0.8[a]	1.6	3.1	6.2	12.5	25.0	50.0
Range of % binding[b]	94.1-96.4	88.2-88.9	74.3-78.7	61.8-63.5	41.1-42.7	27.5-27.9	16.0-17.4

Assay Controls							
	Intra-assay CV[c]		Range of % binding[b]		Mean % recovery[d]		Inter-assay CV[e]
	Run 1	Run 2	Run 1	Run 2	Run 1	Run 2	
Kit Control 1(1.1 ng/mL)[f]	0.4	0.9	92.3-92.8	91.7-92.9	86.4	100	15.7
Kit Control 2 (31.2 ng/ mL)[f]	0.3	3.1	22.8-22.9	23.2-24.6	106.3	96.5	10.7
Low QC (0.6 ng/ mL[g,h]	5.3	0.3	91.0-98.4	99.5-100	116.7	Off curve	12.3
High QC (2.5 ng/ mL) [g,h]	3.5	4.1	71.5-75.4	66.3-70.6	142	196	19.9

a- This is the lower limit of sensitivity of this specific assay. According to WIL standard operating procedures, unknown samples below this value are reported as one-half of this value.
b- $\%B/B_0$ range between assays
c- Based on duplicate counts per minute (cpm)
d- (observed/expected) X 100 (based on calculated mean concentrations from all assays)
e- Based on mean cpm between assays
f- Kit controls are targeted concentrations obtained as dilutions of the kit standard.
g- rPRL purchased from Dr. Parlow at NHPP-NIDDKD.
h- The mathematical calculation of what concentration to use was done in error (see deviations page)

Dihydrotestosterone (DHT)--Active® Dihydrotestosterone RIA (DSL-9600)The ^{125}I radioimmunoassay system used for the quantitative determination of DHT was the Active® Dihydrotestosterone RIA (DSL-9600) from Diagnostic Systems Laboratories,Inc. The procedures listed in the package insert were followed. Except for 1 sample in each of the 50 and 150 mg/kg/day linuron groups that was below the lower limit of sensitivity, all unknown samples and controls were read within the standard curve range of concentration (30 to 3000 pg/mL) and percent binding (79.7 to 11.2). Kit controls were separate dilutions of the kit standards and run in the assay at the concentrations spanning the low and high range of the standard curve itself. Quality control DHT from Sigma-Aldrich was solubilized with methanol and diluted with the kit-supplied Zero Standard (total diluted volume contained ≤ 1% solvent). Intra-assay variability of the assay controls (based on cpm) was ≤ 6.3% (no inter-assay variability since only one assay was performed). The kit control results were within 20% of expected. The percent recovery of the QC DHT was not as expected. Our laboratory does not routinely use these non-kit QCs, so it is uncertain why the data from these non-kit QCs were inconsistent. Since the values of the kit controls and coefficients of variation across all controls were reasonable, the assay run was considered acceptable.

See text table below for additional details on the assay standards, controls, coefficients of variance, binding and percent recovery of controls.

DHT RIA performance

Standard Curve							
pg/mL	30[a]	60	120	225	650	1500	3000
Mean % binding[b]	79.7	61.5	47.7	36.0	23.6	17.9	11.2

Assay Controls				
	Intra-assay CV[c]	Range of % binding[d]	Mean % recovery[e]	Inter-assay CV
Kit Control 1 (100 pg/mL)[f]	2.0	52.9-54.4	92.3	NA
Kit Control 2 (500 pg/mL)[f]	6.3	23.6-25.8	119.3	NA
Low QC (50 pg/mL)[g]	1.1	36.4-37.0	484.4	NA
High QC (500 pg/mL)[g]	4.1	31.5-33.4	64.5	NA

a- This is the lower limit of sensitivity of this specific assay. According to WIL standard operating procedures, unknown samples below this value are reported as one-half of this value.
b- $\%B/B_0$
c- Based on duplicate counts per minute (cpm)
d- $\%B/B_0$ range for all tubes on all assays
e- (observed/expected) X 100 (based on calculated mean concentrations)
f- Kit controls are targeted concentrations obtained as dilutions of the kit standard.
g- DHT purchased from Sigma-Aldrich (Catalog #A 8380).
NA- Not applicable as only one assay was conducted for this hormone

APPENDIX G

Statistical Analysis Summary (Battelle Memorial Institute)

Interlaboratory Validation of the 15-Day Adult Intact Male Rat Assay
Intra-Laboratory Statistical Analysis for WIL Laboratories

EPA CONTRACT NUMBER 68-W-01-023
WORK ASSIGNMENT 5-15

May 4, 2006

Prepared for

U.S. ENVIRONMENTAL PROTECTION AGENCY
ENDOCRINE DISRUPTOR SCREENING PROGRAM
WASHINGTON, D.C.

Prepared by

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Inter-Laboratory Validation of the 15-Day Adult Intact Male Rat Assay
Intra-Laboratory Statistical Analysis for WIL Laboratories

EPA CONTRACT NUMBER 68-W-01-023
WORK ASSIGNMENT 5-15

Zhenxu J. Ma, Author	5/4/2006 Date
Paul I. Feder, Reviewer	May 4, 2006 Date

INTRODUCTION

WIL Laboratories conducted a 15-day adult intact male rat assay according to the test method provided by the EPA.

Two substances Linuron and Phenobarbital were tested, each at three dose levels. In addition a vehicle control group was tested. The sample size was n=15 adult male rats per group, for a total of seven groups and 105 animals per laboratory. This statistical report specifies the summaries, displays, and statistical analyses that were used to summarize the results within WIL Laboratories.

STATISTICAL METHODS

Data

The test method specifies four categories of data:

1. Growth - body weights and food consumption – (7 endpoints)
   - Body weight change (TD8 – TD1)
   - Body weight change (TD15 – TD8)
   - Body weight change (TD15 – TD1)
   - Final body weights (TD15)
   - Food consumption (TD8 - TD1)
   - Food consumption (TD15 - TD8)
   - Food consumption (TD15 - TD1)

The TD15 body weight is the live weight before sacrifice. Body weights were reported in grams (g). Body weight changes for a given period were reported in g/day, which were calculated as the differences between the body weights at the start and the end of the given period divided by the length of the period (i.e., the daily average within the weekly or bi-weekly interval). Food consumption for each animal was reported in g/kg/day, which was calculated as follows. The average of two body weights for a period (Day 1 and Day 8 for period TD8-TD1 and Day 8 and Day 15 for period TD15-TD8) was calculated. The average body weight in grams was transformed to kilograms. The food consumption for the weekly period (in grams) was divided by the average body weight in kilograms. This ratio was divided by 7 days in the period to get the food consumption in g/kg/day for that animal. The food consumption for the period TD15-TD1 was determined as the average of the two weekly average values if both were present. If one weekly value was missing the average for the period TD15-TD1 was reported as missing.

2. Hormonal analysis - (9 hormones)
   - Testosterone (ng/ml)
   - LH (ng/ml)
   - TSH (ng/ml)

T_4 (µg/dl)
T_3 (ng/dl)
FSH (ng/ml)
Estradiol (pg/ml)
Prolactin (ng/ml)
DHT (pg/ml)

3. Organ weights – (9 organs)
   Liver
   Right testis
   Left testis
   Testes paired (sum of left and right testis weights)
   Epididymides (paired weight)
   Entire prostate
   Seminal vesicles with fluid and coagulating gland
   Accessory sex gland (ASG) (sum of entire prostate and seminal vesicles with fluid and coagulating gland weights)
   Thyroid

Organ weights were reported in grams (g). Organ weights were reported wet to the nearest 0.0001 g. Organ weights were analyzed in two ways: unadjusted and adjusted. Adjusted organ weights were calculated as organ weight to final body weight ratio (expressed as percent). Note that paired testes weights and ASG weights were derived values, based on the constituent weights of their derived organs.

.

4. Histology – (5 organs)
   Right testis
   Left testis
   Right Epididymus
   Left Epididymus
   Thyroid

Histology data were not analyzed statistically.

The test method specifies that all rats were to be sacrificed on Test Day (TD) 15. If animals died prior to necropsy their body weights were included in summaries and displays up to the time of death, but were not imputed beyond date of death nor they were included in the final body weight gain summaries (in either the initial or final weight average). Two animals died prior to TD15. These were animals 97223 (Linuron 150) that died on TD5 and animal 97175 (Phenobarbitol 100) that died on TD4. These animals are not included in the data summaries.

All data that entered into the statistical analyses were *a priori* valid data. Appendix C contains a preliminary summary of these data.

Outlier Detection

Outlier screens were carried out prior to analysis. Screens were carried out separately for each endpoint, based on untransformed data. When both unadjusted and body weight adjusted values are called for in the statistical analysis plan (organ weights), the outlier screens were only carried out based on the unadjusted values.

For each endpoint a one way analysis of variance model was fitted to the data. The data include seven groups with n=15 animals per group, less any data omitted due to deaths, missing values, or procedural errors. For purposes of outlier screening separate standard deviations were assumed within each group. Studentized residuals were determined based on the analysis of variance fit and ordered in absolute value. Assuming no data had been omitted, there would have been 105 values. A procedure which generalizes Grubbs (1969) procedure to accommodate heterogeneous variances was used. The absolute studentized residuals were compared to a cutoff value corresponding to a 2.5% significance level (for a two-sided 5% level test) of the maximum of seven component maximum studentized residuals, each component maximum studentized residual based on 15 observations. The cutoff value was based on a simulation study to determine the upper 97.5% point of the distribution of the maximum of seven independent maximum studentized residuals, each with 14 degrees of freedom, from standard normal distributions. This cutoff value is 2.84. Any studentized residual in excess of 2.84 in absolute value was flagged. Just a single iteration of the outlier screening procedure was carried out.

Normal probability plots of the studentized residuals were prepared (Appendix A). If the flagged values appeared to be outliers in the probability plots, in that they departed from the trend in the body of the residuals, they were treated as potential outliers. If the trend observed in the tails of the normal probability plot was continuous but heavily skewed or considerably heavier tailed than normal, a data transformation (e.g. square root, (natural) logarithm) might be attempted to improve agreement with normal distribution assumptions. The outlier screen would be repeated on the transformed data. However, if the tails of the normal probability plot depart just slightly or moderately from straight line behavior, the data would be analyzed without transformation. No transformations were attempted for this analysis due to the consideration of applying a uniform approach across laboratories, so the results could be more easily combined.

The flagged values were sent to the study director who determined whether these values were to be included in all the analyses, were to be treated as outliers (i.e. both included in analyses and excluded from analyses), or were to be excluded from all analyses. Subsequent statistical analyses were carried out both including and excluding the outliers that were specified by the study director to be treated as outliers. The disposition of each flagged value is summarized in Appendix B.

Heterogeneity of Residual Variances among Treatment Groups

Tests for heterogeneity of variance were carried out on the data excluding the outliers. For each endpoint extent of heterogeneity of variability was assessed across treatment groups. A one-way analysis of variance model was fitted to the data, including the factor treatment (fixed). Three versions of the model were fitted to test for heterogeneity of residual variance.

1. Separate variances for each treatment group (7 variances)
2. Separate variances for each substance (or control) (3 variances)
3. Common variances across all groups

For each endpoint, these models were compared by likelihood ratio tests and a "best" model was selected for further statistical analyses (Table 1).

Data Summaries

Data summaries include tables and figures. Summary tables were prepared including all the data and excluding the outliers. Summary figures were prepared only including all the data.

Tables

Summary values for the seven body weight and food consumption endpoints are displayed in Tables 2 and 3. There is one table per substance.

For each endpoint and each dose group the following statistics are reported:

- Number of animals on which the statistic is based
- Mean ± standard error
- Coefficient of variation
- Difference of mean from control group mean ± standard error
- Ratio of mean to control group mean ± standard error[1]

In addition, the linear trend slope contrast was estimated for each substance based on the control group and the three graded dose groups, treating the control group and the

[1] If X, Y denote the control group least squares mean and the dose group least squares mean respectively, with variance-covariance matrix (S_X^2, S_Y^2, S_{XY}), where S_{XY} is zero because X and Y are independent, an approximate standard error for $R \equiv (Y/X) \times 100\%$ is

$$Se[R(X, Y)] \approx |1/X| \, [(Y/X)^2 \, S_X^2 + S_Y^2]^{1/2} \times 100\%$$

three dose groups as equally spaced[2]. The estimated slope and its standard error are reported.

For ease of presentation each table is broken into three pages, one page per dose level. The summary results for the vehicle control and the linear dose trend test results are presented on each page. For the same test substance they are same on all three pages of the table.

Tables 4 and 5 display summary values for the nine organ weight endpoints specified in the test method. These results include both unadjusted and body-weight adjusted organ weights. The tables include the same summary statistics as those discussed for Tables 2 and 3.

Tables 6 and 7 display summary values for the nine hormonal analysis endpoints specified in the test method. There is one table per substance. The tables include the same summary statistics as discussed for Tables 2 and 3.

Tables 8 and 9 display summary values for the two hormonal assay parameters for which outliers were excluded. There is one table per substance. The tables include the same summary statistics as discussed for Tables 2 and 3.

Figures

The figures include mean daily body weights figures and figures to compare the various endpoints across substances and dose groups. The figures include all the data. For organ weights, figures were prepared based on both the unadjusted weights and the adjusted organ weights (i.e., organ to body weight ratios).

Figures 1-2 display mean body weight ± 2 standard errors for each day from TD1 to TD15 for the control group and for each dose group. Figure 1 corresponds to Linuron and Figure 2 corresponds to Phenobarbitol.

For the 7 body weight and food consumption measures, the 9 unadjusted organ weights, the 9 organ weight to body weight ratios, and the 9 hormone concentrations (34 endpoints) summarized in Tables 2-9, Figures 3 through 36 were prepared to display the (least squares) means ± 2 standard errors for each of the seven dose groups (control group + three dose groups × 2 substances). Each figure contains seven bars, corresponding to a control group or substance and dose group. Each bar is centered at the (least squares mean) and extends two standard errors above and below the least squares mean.

[2] If X_0, X_1, X_2, X_3 denote the least squares means for the control group "0" and (equally spaced) dose groups "1", "2", "3" then the linear contrast among these is defined to be

$$\text{Linear Contrast} \equiv [-3X_0 - X_1 + X_2 + 3X_3]/[20]^{1/2}$$

Analysis of Variance

For each of the 34 endpoints summarized in Tables 2-9 analysis of variance models were fitted to the data to estimate treatment effects. For the nine organ weight responses the unadjusted responses were analyzed as well as the organ to final body weight ratio (percent) responses.

Analyses were carried out based on all the data and after omitting outliers (enumerated in Appendix B). The (possibly heterogeneous) residual variance structure assumed in these analyses is as discussed in the section - "Heterogeneity of Variance across Treatment Groups." Analyses were carried out on the untransformed data, using the simplest variance structure compatible with the data.

For each response the following one-way analysis of variance model was fitted to the data. The treatment group in the analysis of variance model is the fixed effect. The factors in the analysis of variance model are as shown below.

Source	df
Treatment	6
Residual = Replicate (Treatment)	14×7=98
	104

Least squares (LS) means for individual treatment groups and for differences between dose groups and control group and associated standard errors and ± 2 standard error intervals were calculated based on the above model. (For these data the least squares mean coincides with the simple arithmetic mean.) In addition linear trend contrasts among the control group and the three dose groups within a substance were calculated, treating the control group and the three dose groups as equally spaced (using the linear contrast shown in footnote 2). For each substance separately, least squares means were compared between the treatment groups and the control group by means of two-sample t-tests. Linear trend statistics were compared to 0 trend by means of one-sample t-tests.

Two-tailed unadjusted significance levels were reported. If the unadjusted significance levels were less than 0.05, they were indicated with a single asterisk, '*'. If they were less than 0.00625 for the comparisons of test substance dose to vehicle or for the linear trend test, they were indicated with two asterisks, '**'. A significance level of 0.00625 (≈ 0.05/8) corresponds to Bonferroni's simultaneity adjusted significance level 0.05, adjusting for six comparisons of test substance dose groups with control (2 substances × 3 doses per substance) and two linear trend comparisons.

Round Off

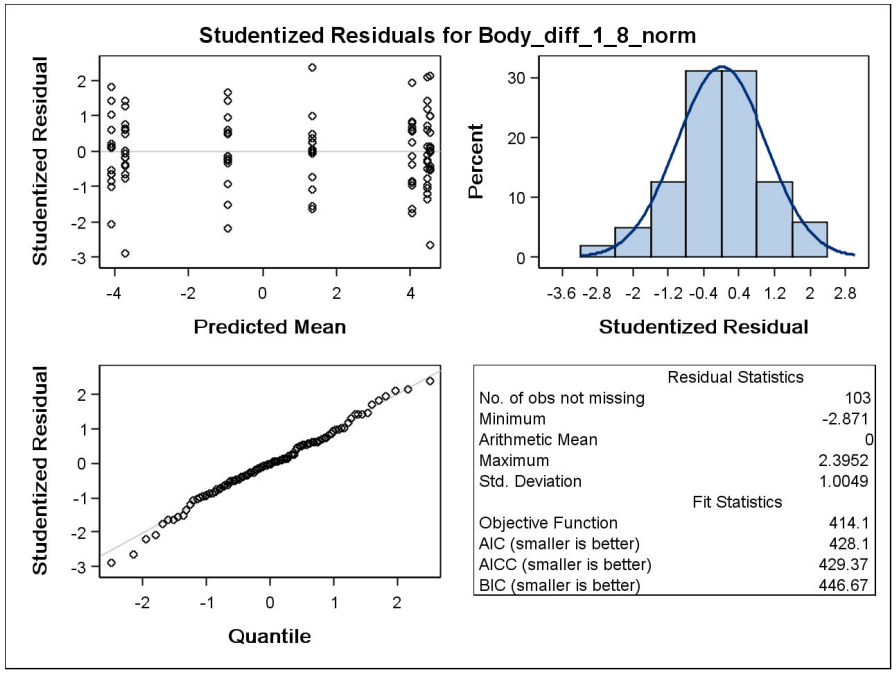
Derived numbers in the tables may differ from computer listings or hand calculations by one or several digits in the least significant figure due to round off in intermediate calculations.

Appendix A

Normal Probability Plots for Growth, Food Consumptions, Organ Weights, Organ Weight to Body Ratios, and Hormonal Analysis Endpoints.

WIL Adult Males
Outlier Screens
Body Weight Change TD8-TD1 (g/day)

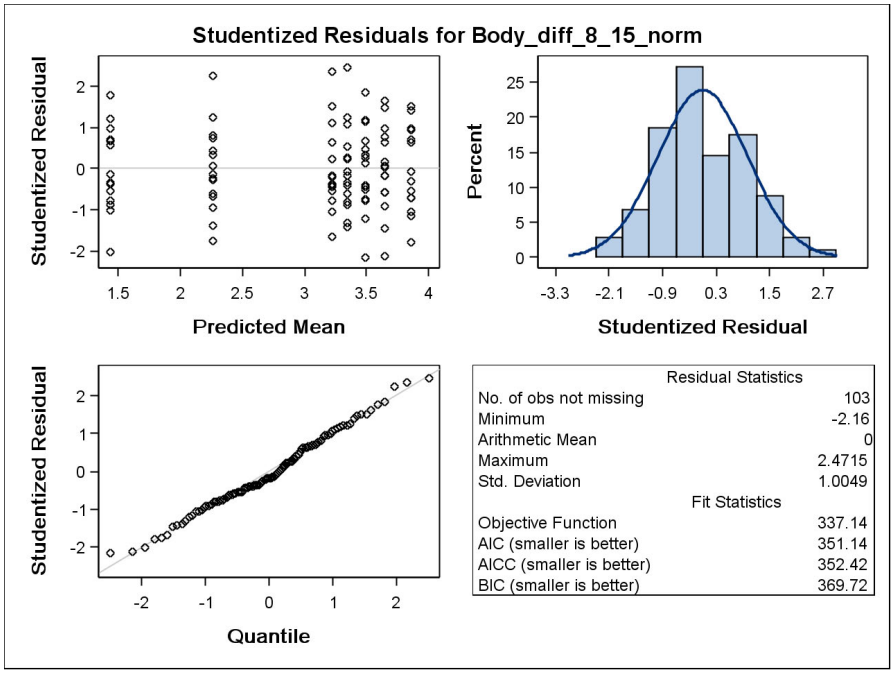
The Mixed Procedure



Residual Statistics	
No. of obs not missing	103
Minimum	-2.871
Arithmetic Mean	0
Maximum	2.3952
Std. Deviation	1.0049
Fit Statistics	
Objective Function	414.1
AIC (smaller is better)	428.1
AICC (smaller is better)	429.37
BIC (smaller is better)	446.67

WIL Adult Males
Outlier Screens
Body Weight Change TD15-TD8 (g/day)

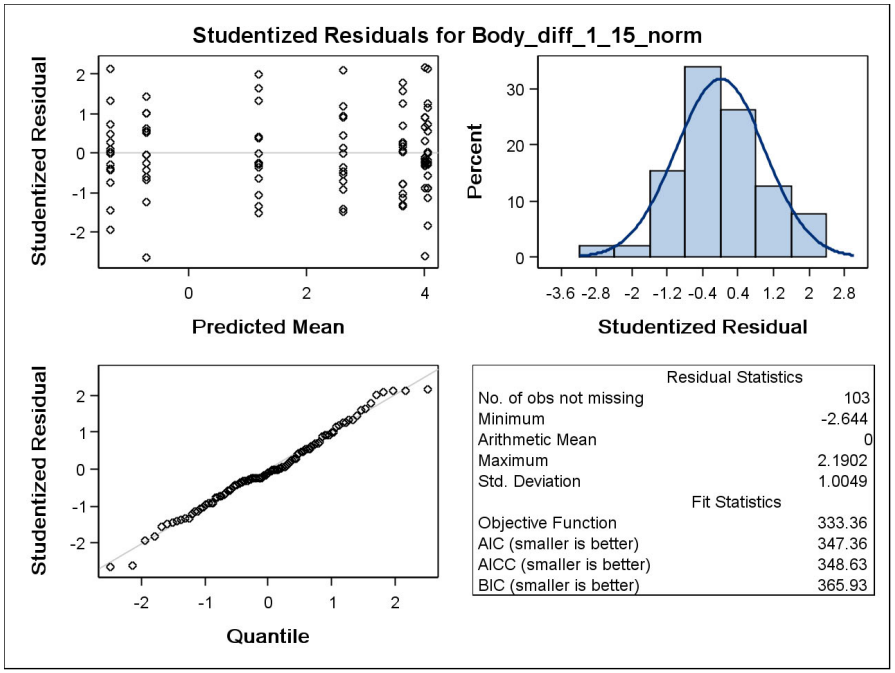
The Mixed Procedure



Residual Statistics	
No. of obs not missing	103
Minimum	-2.16
Arithmetic Mean	0
Maximum	2.4715
Std. Deviation	1.0049
Fit Statistics	
Objective Function	337.14
AIC (smaller is better)	351.14
AICC (smaller is better)	352.42
BIC (smaller is better)	369.72

WIL Adult Males
Outlier Screens
Body Weight Change TD15-TD1 (g/day)

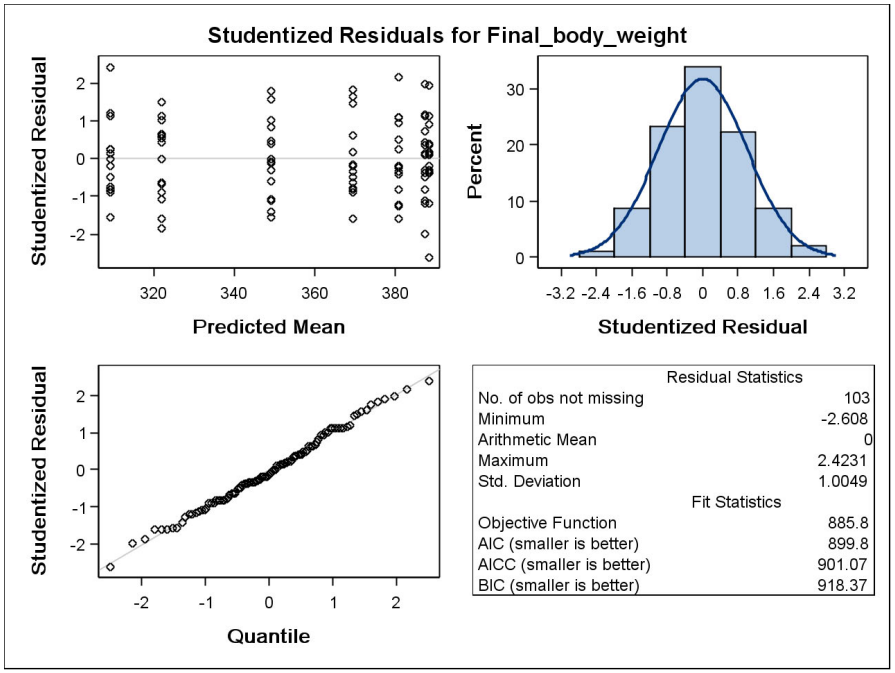
The Mixed Procedure



Residual Statistics	
No. of obs not missing	103
Minimum	-2.644
Arithmetic Mean	0
Maximum	2.1902
Std. Deviation	1.0049
Fit Statistics	
Objective Function	333.36
AIC (smaller is better)	347.36
AICC (smaller is better)	348.63
BIC (smaller is better)	365.93

WIL Adult Males
Outlier Screens
Final Body Weight (g)

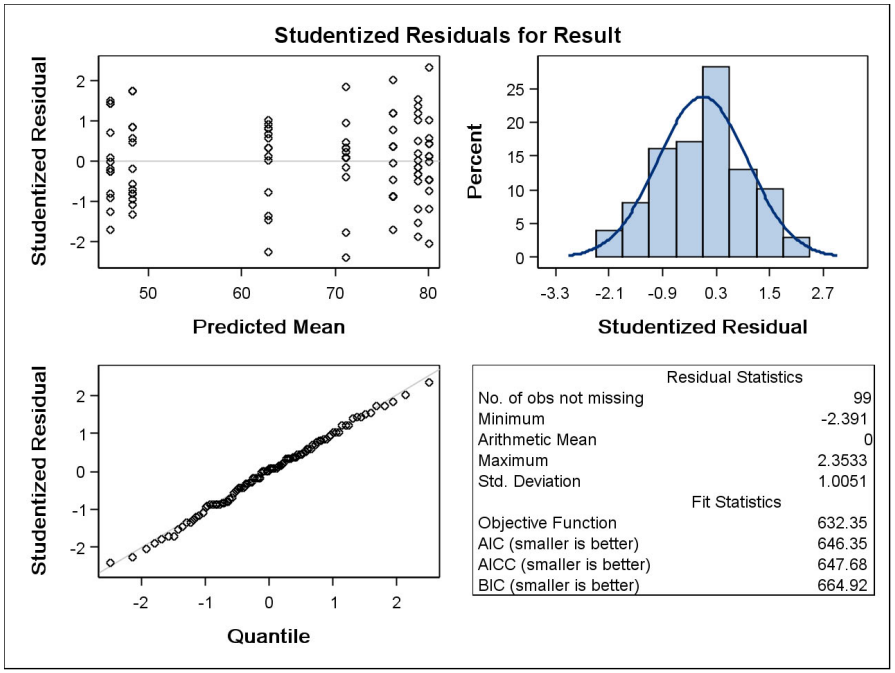
The Mixed Procedure



Residual Statistics	
No. of obs not missing	103
Minimum	-2.608
Arithmetic Mean	0
Maximum	2.4231
Std. Deviation	1.0049
Fit Statistics	
Objective Function	885.8
AIC (smaller is better)	899.8
AICC (smaller is better)	901.07
BIC (smaller is better)	918.37

WIL Adult Males
Outlier Screens
Food Consumption TD8-TD1 (g/kg/day)

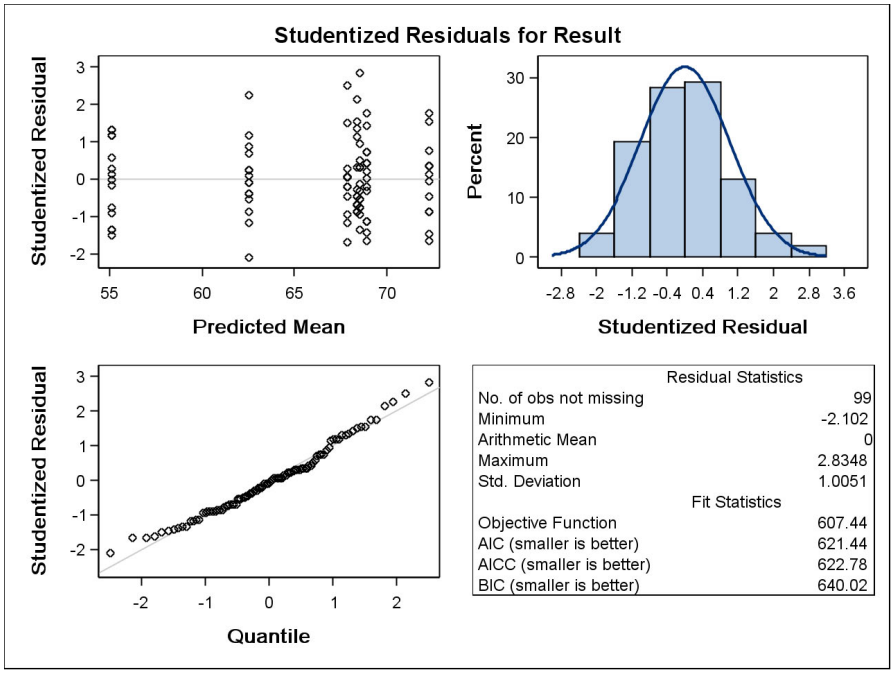
The Mixed Procedure



Residual Statistics	
No. of obs not missing	99
Minimum	-2.391
Arithmetic Mean	0
Maximum	2.3533
Std. Deviation	1.0051
Fit Statistics	
Objective Function	632.35
AIC (smaller is better)	646.35
AICC (smaller is better)	647.68
BIC (smaller is better)	664.92

WIL Adult Males
Outlier Screens
Food Consumption TD15-TD8 (g/kg/day)

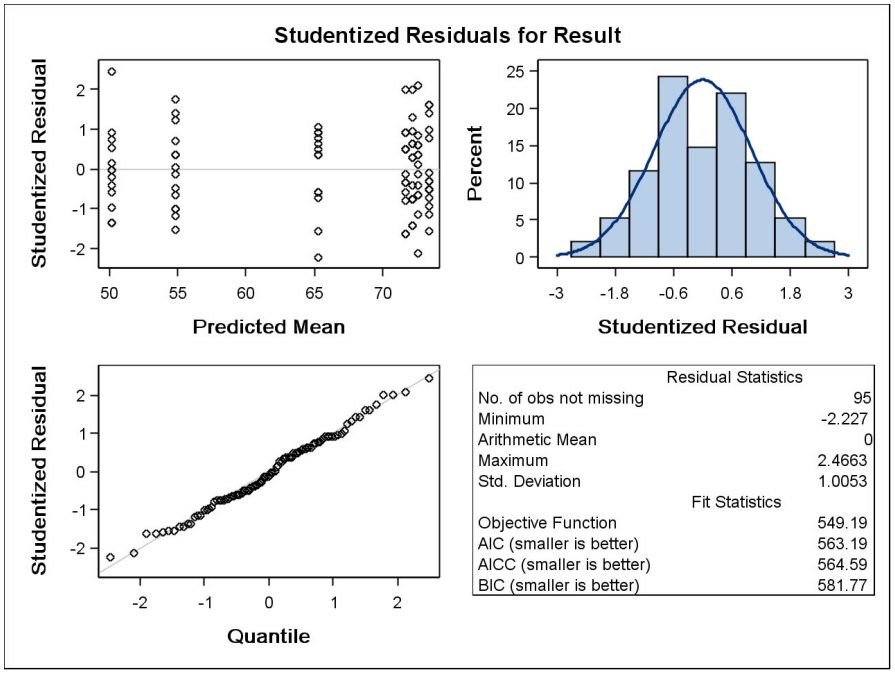
The Mixed Procedure



Residual Statistics	
No. of obs not missing	99
Minimum	-2.102
Arithmetic Mean	0
Maximum	2.8348
Std. Deviation	1.0051
Fit Statistics	
Objective Function	607.44
AIC (smaller is better)	621.44
AICC (smaller is better)	622.78
BIC (smaller is better)	640.02

WIL Adult Males
Outlier Screens
Food Consumption TD15-TD1 (g/kg/day)

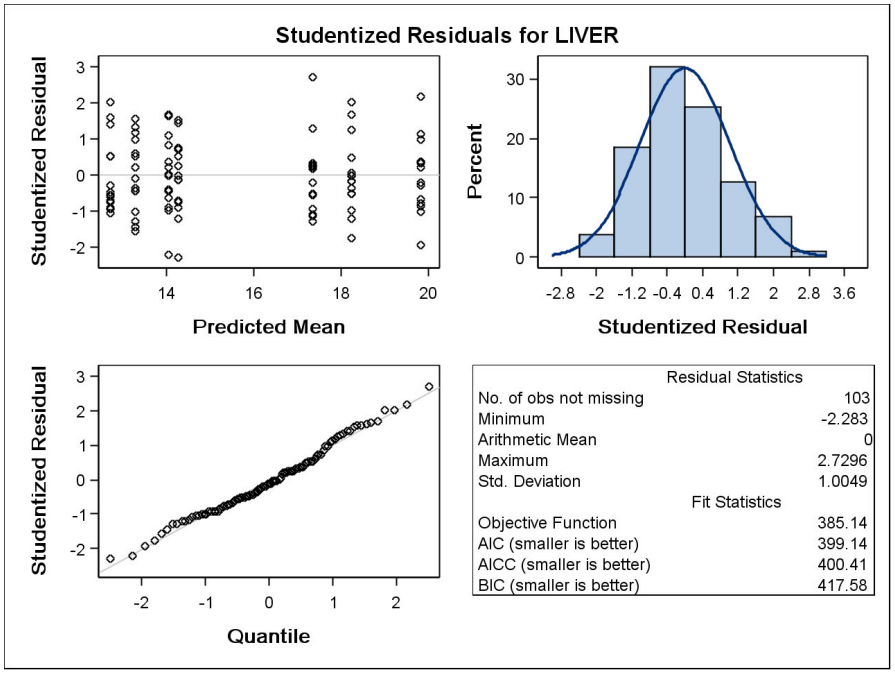
The Mixed Procedure



Residual Statistics	
No. of obs not missing	95
Minimum	-2.227
Arithmetic Mean	0
Maximum	2.4663
Std. Deviation	1.0053
Fit Statistics	
Objective Function	549.19
AIC (smaller is better)	563.19
AICC (smaller is better)	564.59
BIC (smaller is better)	581.77

WIL Adult Males
Outlier Screens
Liver Weight (g)

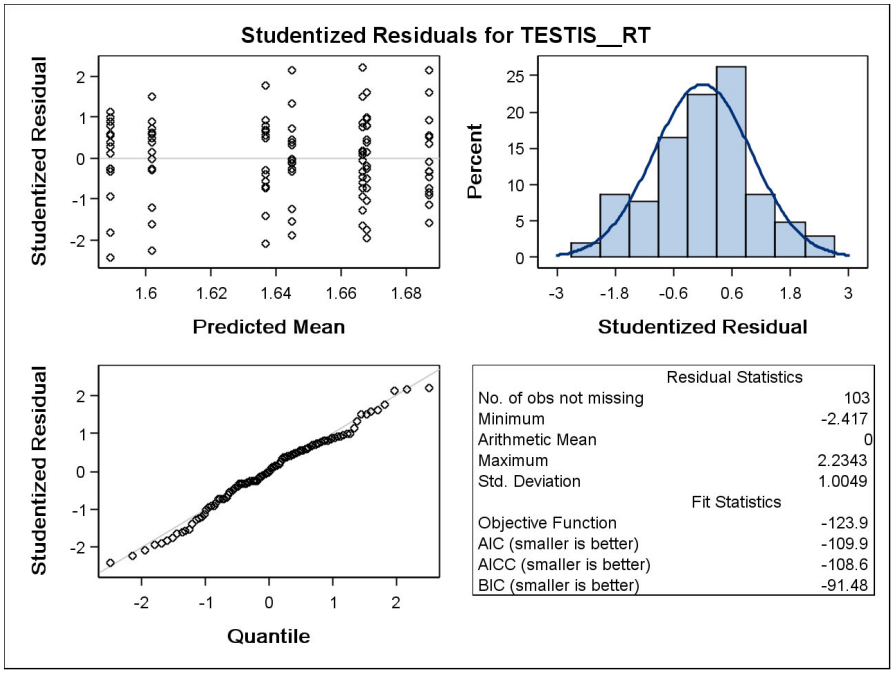
The Mixed Procedure



Residual Statistics	
No. of obs not missing	103
Minimum	-2.283
Arithmetic Mean	0
Maximum	2.7296
Std. Deviation	1.0049
Fit Statistics	
Objective Function	385.14
AIC (smaller is better)	399.14
AICC (smaller is better)	400.41
BIC (smaller is better)	417.58

WIL Adult Males
Outlier Screens
Right Testis Weight (g)

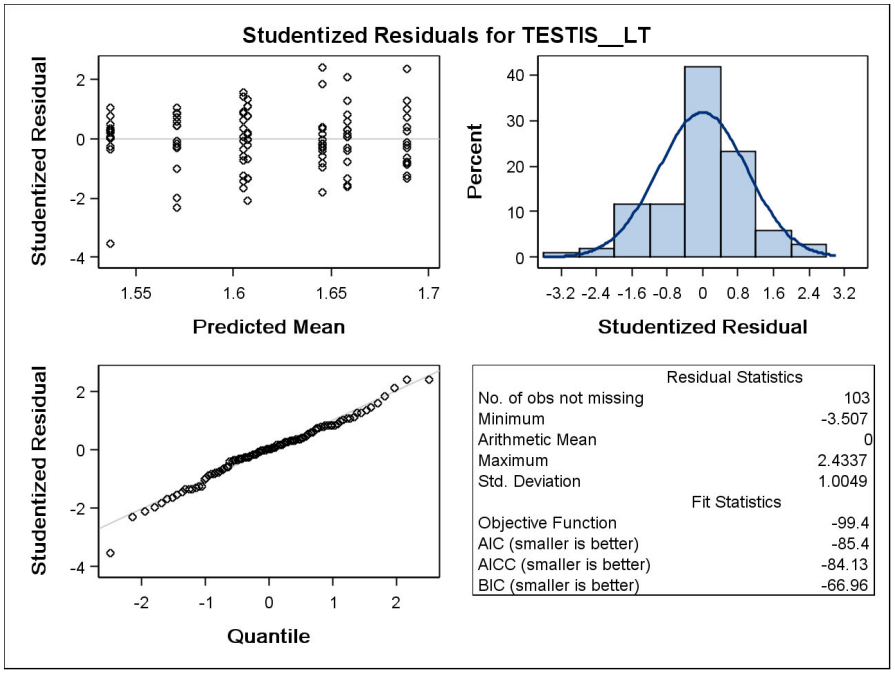
The Mixed Procedure



Residual Statistics	
No. of obs not missing	103
Minimum	-2.417
Arithmetic Mean	0
Maximum	2.2343
Std. Deviation	1.0049
Fit Statistics	
Objective Function	-123.9
AIC (smaller is better)	-109.9
AICC (smaller is better)	-108.6
BIC (smaller is better)	-91.48

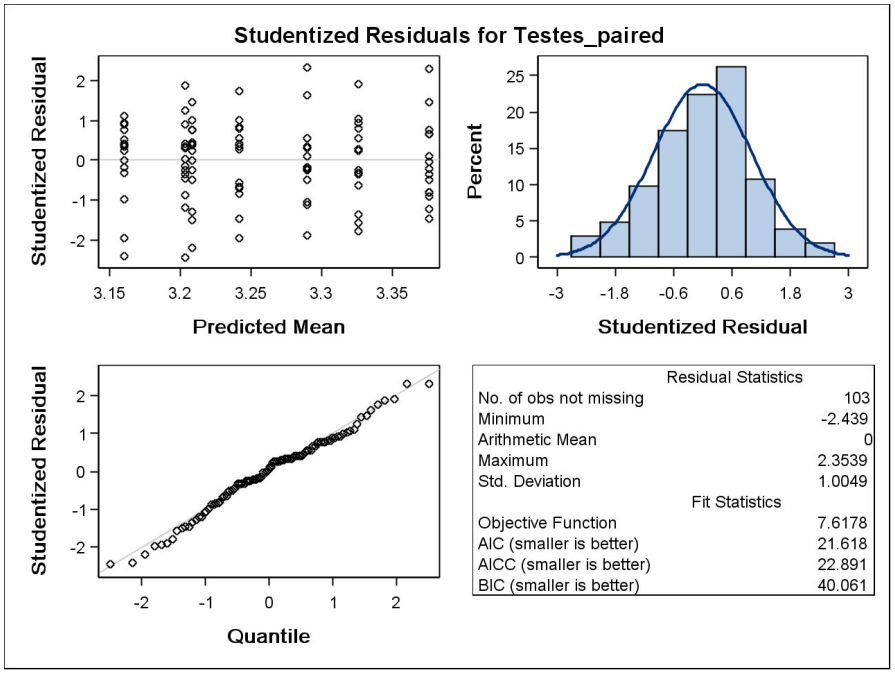
WIL Adult Males
Outlier Screens
Left Testis Weight (g)

The Mixed Procedure



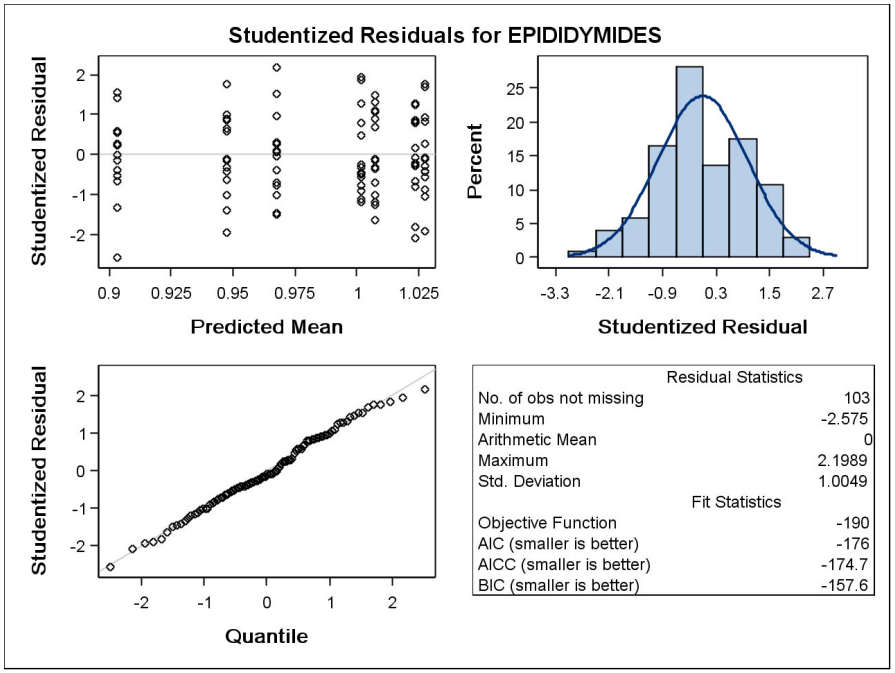
WIL Adult Males
Outlier Screens
Testes Paired Weight (g)

The Mixed Procedure



WIL Adult Males
Outlier Screens
EpididymidesWeight (g)

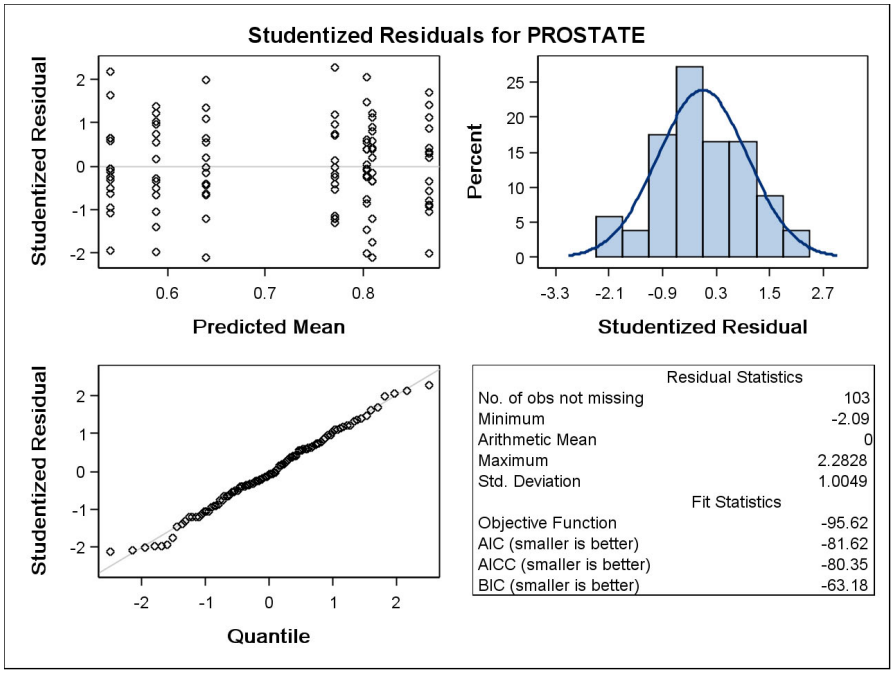
The Mixed Procedure



Residual Statistics	
No. of obs not missing	103
Minimum	-2.575
Arithmetic Mean	0
Maximum	2.1989
Std. Deviation	1.0049
Fit Statistics	
Objective Function	-190
AIC (smaller is better)	-176
AICC (smaller is better)	-174.7
BIC (smaller is better)	-157.6

WIL Adult Males
Outlier Screens
Entire Prostate Weight (g)

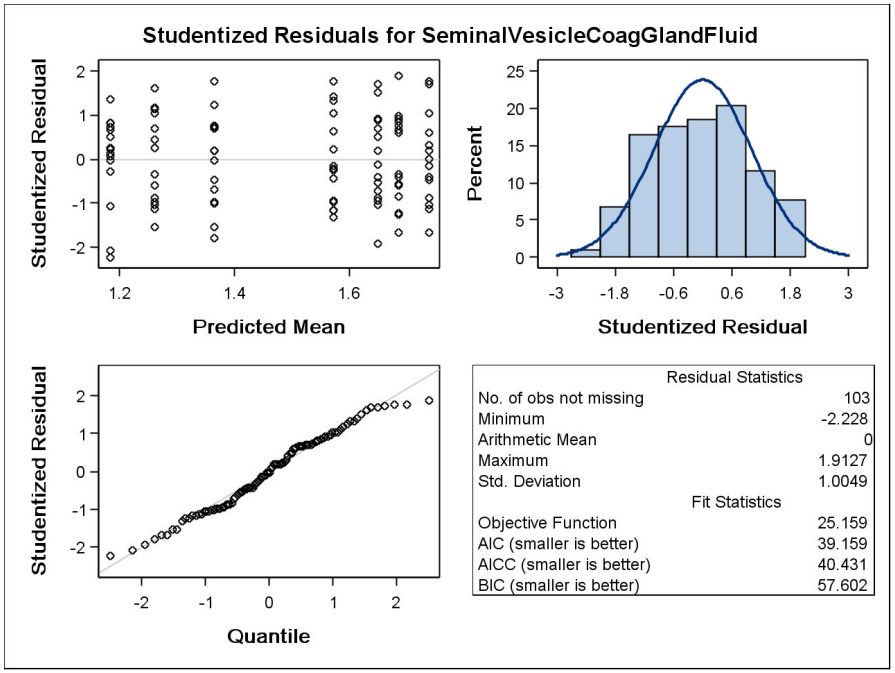
The Mixed Procedure



Residual Statistics	
No. of obs not missing	103
Minimum	-2.09
Arithmetic Mean	0
Maximum	2.2828
Std. Deviation	1.0049
Fit Statistics	
Objective Function	-95.62
AIC (smaller is better)	-81.62
AICC (smaller is better)	-80.35
BIC (smaller is better)	-63.18

WIL Adult Males
Outlier Screens
Seminal Vesicles with Fluid and Coagulating Gland Weight (g)

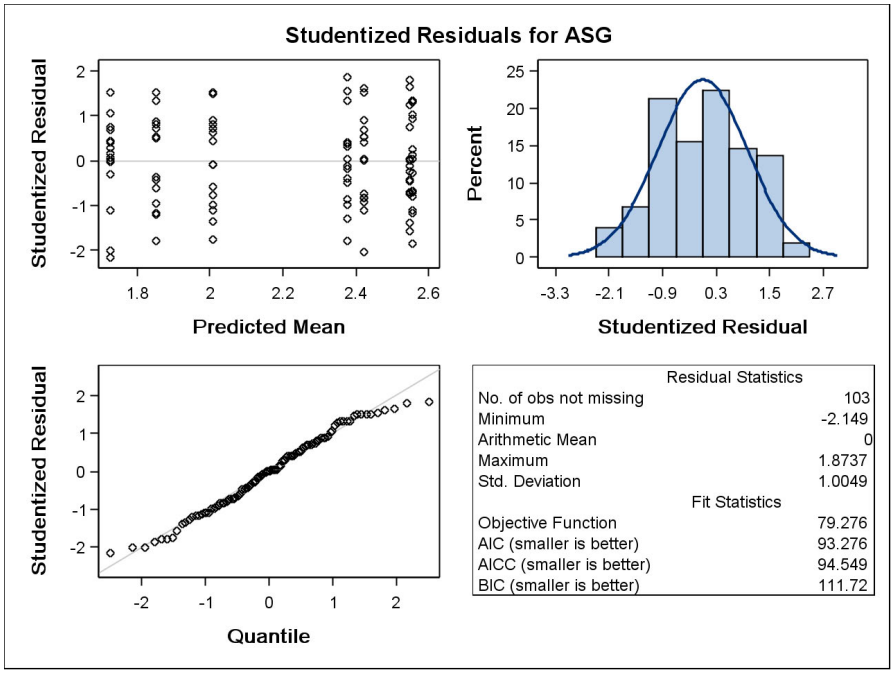
The Mixed Procedure



Residual Statistics	
No. of obs not missing	103
Minimum	-2.228
Arithmetic Mean	0
Maximum	1.9127
Std. Deviation	1.0049
Fit Statistics	
Objective Function	25.159
AIC (smaller is better)	39.159
AICC (smaller is better)	40.431
BIC (smaller is better)	57.602

WIL Adult Males
Outlier Screens
Accessory Sex Gland Weight (g)

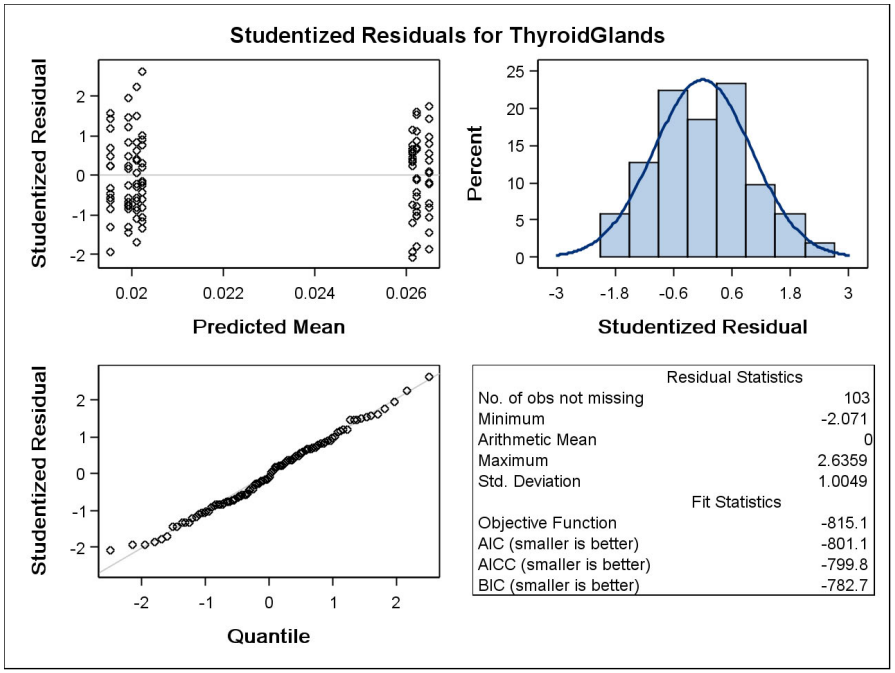
The Mixed Procedure



Residual Statistics	
No. of obs not missing	103
Minimum	-2.149
Arithmetic Mean	0
Maximum	1.8737
Std. Deviation	1.0049
Fit Statistics	
Objective Function	79.276
AIC (smaller is better)	93.276
AICC (smaller is better)	94.549
BIC (smaller is better)	111.72

WIL Adult Males
Outlier Screens
Thyroid Weight (g)

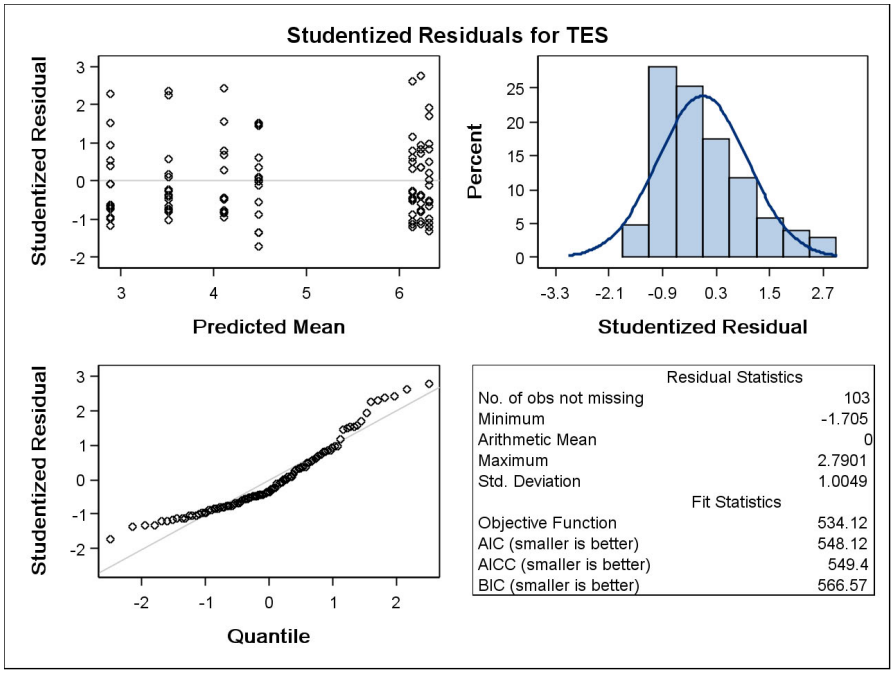
The Mixed Procedure



Residual Statistics	
No. of obs not missing	103
Minimum	-2.071
Arithmetic Mean	0
Maximum	2.6359
Std. Deviation	1.0049
Fit Statistics	
Objective Function	-815.1
AIC (smaller is better)	-801.1
AICC (smaller is better)	-799.8
BIC (smaller is better)	-782.7

WIL Adult Males
Outlier Screens
Testosterone (ng/ml)

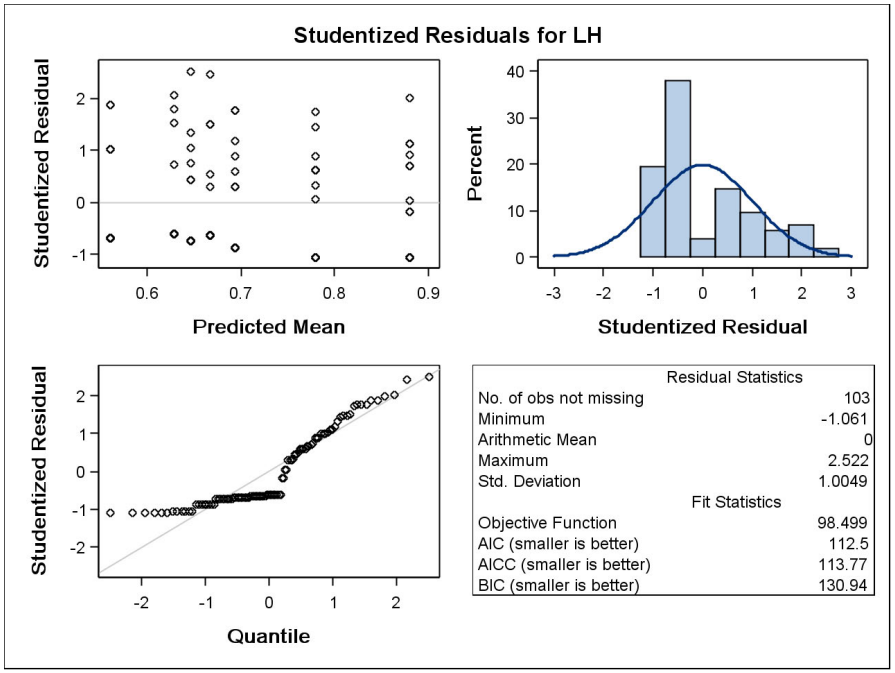
The Mixed Procedure



Residual Statistics	
No. of obs not missing	103
Minimum	-1.705
Arithmetic Mean	0
Maximum	2.7901
Std. Deviation	1.0049
Fit Statistics	
Objective Function	534.12
AIC (smaller is better)	548.12
AICC (smaller is better)	549.4
BIC (smaller is better)	566.57

WIL Adult Males
Outlier Screens
LH (ng/ml)

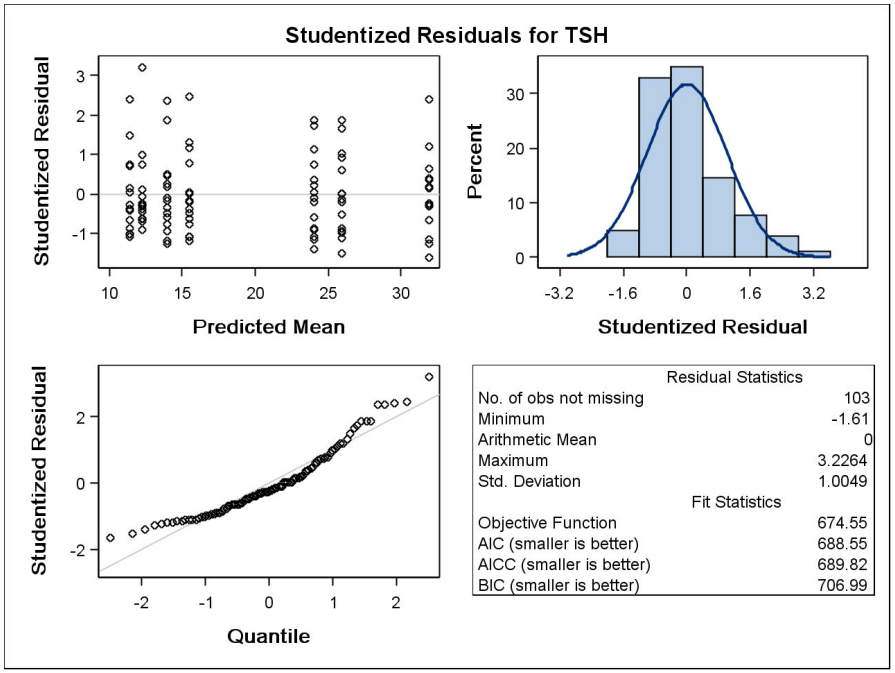
The Mixed Procedure



Residual Statistics	
No. of obs not missing	103
Minimum	-1.061
Arithmetic Mean	0
Maximum	2.522
Std. Deviation	1.0049
Fit Statistics	
Objective Function	98.499
AIC (smaller is better)	112.5
AICC (smaller is better)	113.77
BIC (smaller is better)	130.94

WIL Adult Males
Outlier Screens
TSH (ng/ml)

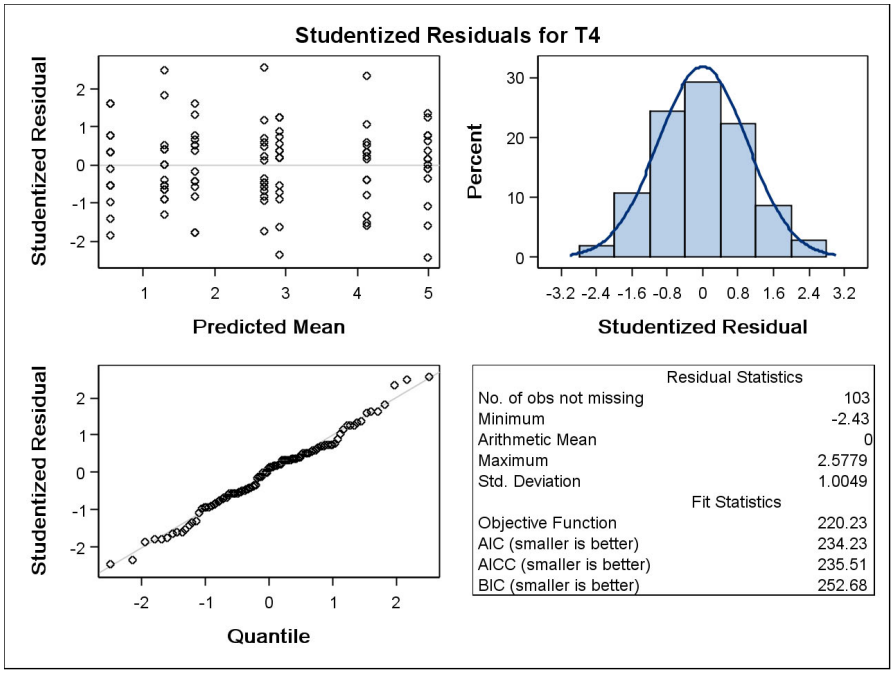
The Mixed Procedure



Residual Statistics	
No. of obs not missing	103
Minimum	-1.61
Arithmetic Mean	0
Maximum	3.2264
Std. Deviation	1.0049
Fit Statistics	
Objective Function	674.55
AIC (smaller is better)	688.55
AICC (smaller is better)	689.82
BIC (smaller is better)	706.99

WIL Adult Males
Outlier Screens
T4 (ug/dl)

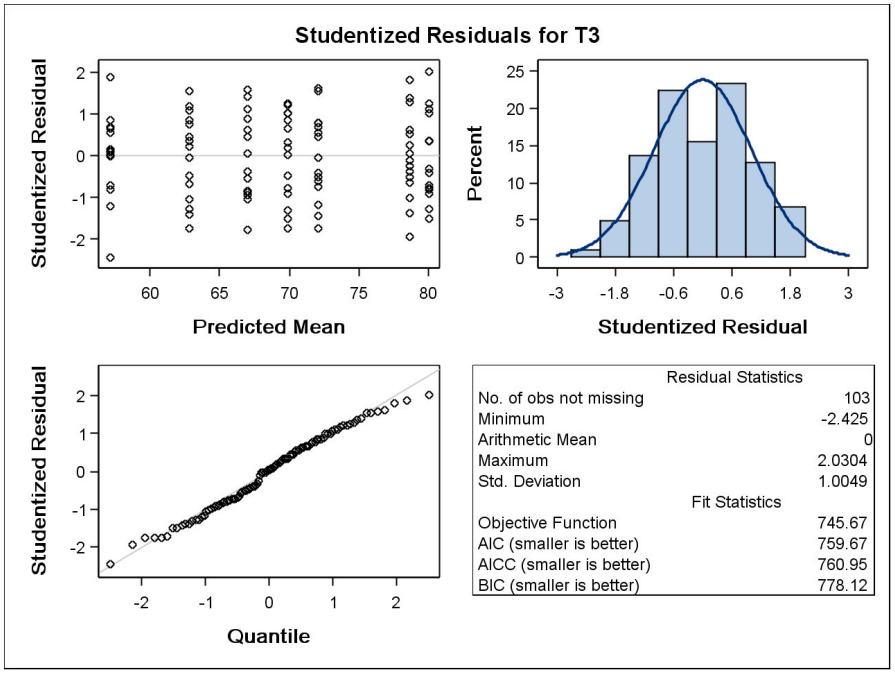
The Mixed Procedure



Residual Statistics	
No. of obs not missing	103
Minimum	-2.43
Arithmetic Mean	0
Maximum	2.5779
Std. Deviation	1.0049
Fit Statistics	
Objective Function	220.23
AIC (smaller is better)	234.23
AICC (smaller is better)	235.51
BIC (smaller is better)	252.68

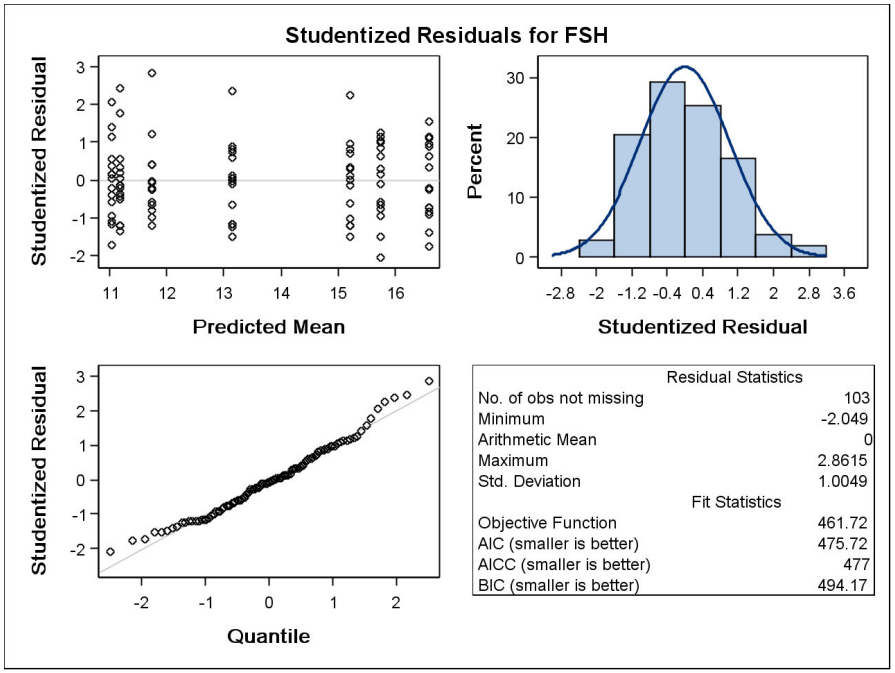
WIL Adult Males
Outlier Screens
T3 (ng/dl)

The Mixed Procedure



WIL Adult Males
Outlier Screens
FSH (ng/ml)

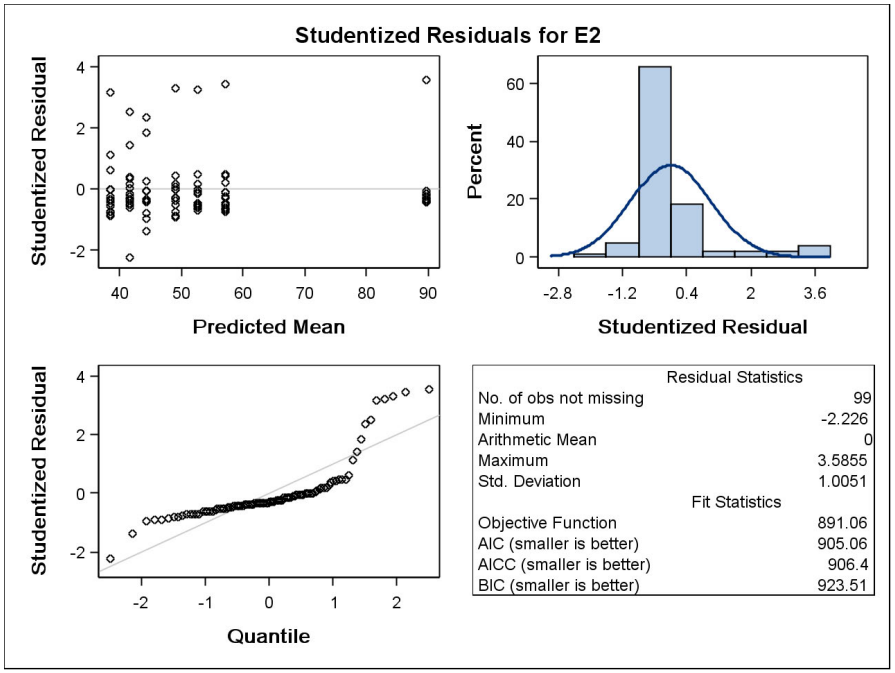
The Mixed Procedure



Residual Statistics	
No. of obs not missing	103
Minimum	-2.049
Arithmetic Mean	0
Maximum	2.8615
Std. Deviation	1.0049
Fit Statistics	
Objective Function	461.72
AIC (smaller is better)	475.72
AICC (smaller is better)	477
BIC (smaller is better)	494.17

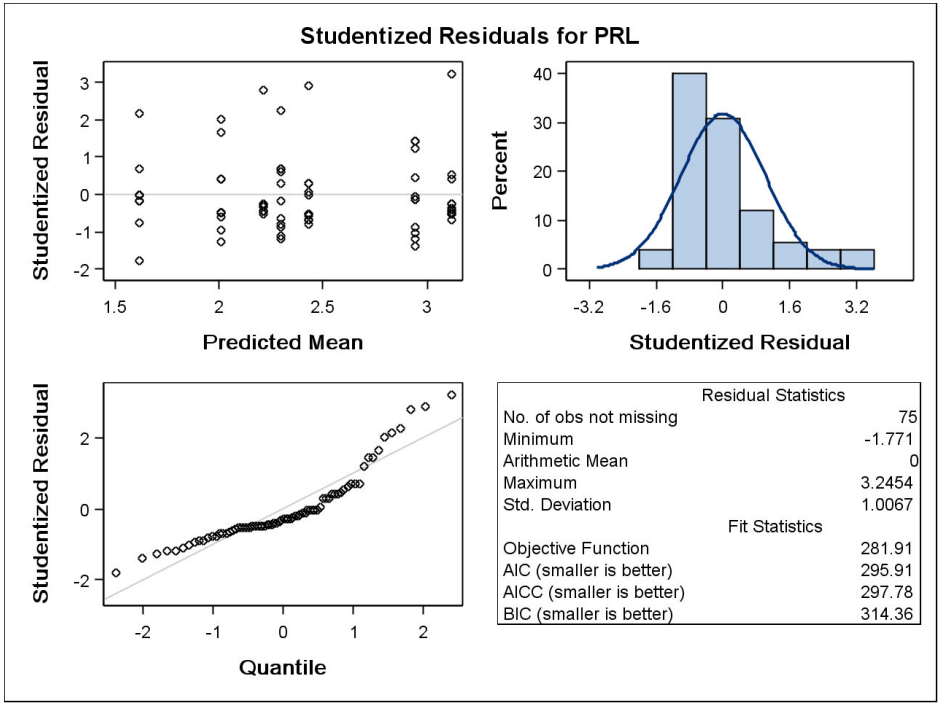
WIL Adult Males
Outlier Screens
Estradiol (pg/ml)

The Mixed Procedure



WIL Adult Males
Outlier Screens
Prolactin (ng/ml)

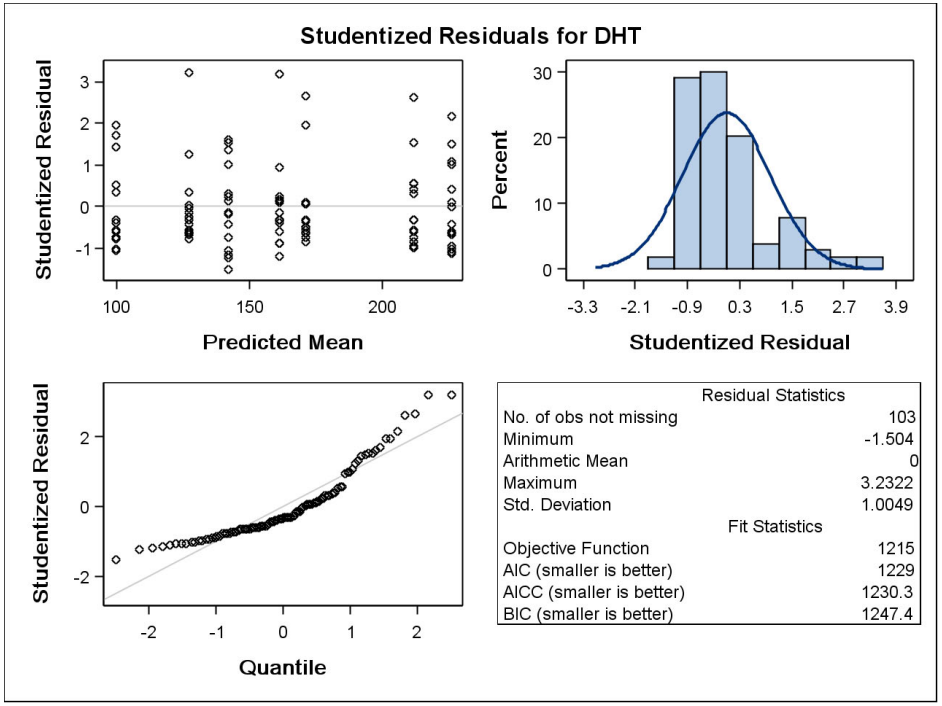
The Mixed Procedure



Residual Statistics	
No. of obs not missing	75
Minimum	-1.771
Arithmetic Mean	0
Maximum	3.2454
Std. Deviation	1.0067
Fit Statistics	
Objective Function	281.91
AIC (smaller is better)	295.91
AICC (smaller is better)	297.78
BIC (smaller is better)	314.36

WIL Adult Males
Outlier Screens
DHT (pg/ml)

The Mixed Procedure



Residual Statistics	
No. of obs not missing	103
Minimum	-1.504
Arithmetic Mean	0
Maximum	3.2322
Std. Deviation	1.0049
Fit Statistics	
Objective Function	1215
AIC (smaller is better)	1229
AICC (smaller is better)	1230.3
BIC (smaller is better)	1247.4

Appendix B

Potential Outliers Flagged by the Outlier Detection Procedure. Flag Value if Absolute Studentized Residual ≥ 2.84. Disposition of Flagged Values in Analysis.

Parameter	Test Chemical	Dosage Level	Animal Number	Observed	Predicted	Residual	Student
Values Included in Analysis[1]							
Body Weight Change (TD8-TD1) (g/day)	Linuron	100	97163	-11.100	-3.7105	-7.3895	-2.8709
Left Testis Weight (g)	Phenobarbital	50	97232	0.31520	1.53634	-1.2211	-3.5071
TSH (ng/ml)	Linuron	100	97166	29.5000	12.2467	17.253	3.2264
FSH (ng/ml)	Phenobarbital	100	97158	18.0000	11.7357	6.2643	2.8615
Prolactin (ng/ml)	Phenobarbital	50	97135	8.6000	2.42727	6.1727	2.9204
Values Treated as Outliers[2]							
Estradiol (pg/ml)	Vehicle	0	97136	105.900	38.3533	67.547	3.1826
	Linuron	100	97132	196.100	57.0000	139.100	3.4699
	Linuron	150	97140	142.100	52.5462	89.554	3.2581
	Phenobarbital	50	97129	118.900	48.8357	70.064	3.3292
	Phenobarbital	100	97120	495.900	89.6000	406.300	3.5855
Prolactin (ng/ml)	Linuron	50	97206	16.3000	3.11538	13.1846	3.2454

[1] Potential outliers judged to be valid data and included in analyses.
[2] Potential outliers judged to be outliers and both included in analyses and excluded from analyses.

Appendix C

Preliminary Summary Results for Growth and Body Weight, Food Consumption, Organ Weights, Organ Weight to Body Ratios (Adj. Organ Weights), and Hormonal Analysis Endpoints.

WIL Adult Males
Descriptive Statistics

od	parm	Test Chemical	Dosage Level	N	Mean	Std	CV	Min	Max
1	**Body Weight Change TD8-TD1 (g/day)**	Linuron	50	15	-0.975	1.713	-175.671	-4.586	1.843
		Linuron	100	15	-3.710	2.664	-71.803	-11.100	0.029
		Linuron	150	14	-4.110	2.847	-69.269	-9.743	0.943
		Phenobarbital	25	15	4.435	2.090	47.114	1.729	8.714
		Phenobarbital	50	15	4.015	1.558	38.811	1.414	6.957
		Phenobarbital	100	14	1.337	1.649	123.363	-1.229	5.143
		Vehicle(0.25% methylcellulose)	0	15	4.511	1.287	28.527	1.257	7.186
2	**Body Weight Change TD15-TD8 (g/day)**	Linuron	50	15	3.339	1.773	53.087	0.943	7.571
		Linuron	100	15	2.257	1.206	53.429	0.214	4.886
		Linuron	150	14	1.428	1.175	82.301	-0.843	3.457
		Phenobarbital	25	15	3.637	1.278	35.142	1.043	5.671
		Phenobarbital	50	15	3.213	1.136	35.354	1.400	5.814
		Phenobarbital	100	14	3.858	1.409	36.512	1.443	5.929
		Vehicle(0.25% methylcellulose)	0	15	3.483	1.039	29.836	1.314	5.357
3	**Body Weight Change TD15-TD1 (g/day)**	Linuron	50	15	1.182	1.200	101.548	-0.586	3.529
		Linuron	100	15	-0.727	1.499	-206.333	-4.557	1.379
		Linuron	150	14	-1.341	1.136	-84.698	-3.457	1.000
		Phenobarbital	25	15	4.036	1.518	37.620	1.386	7.193
		Phenobarbital	50	15	3.614	1.192	32.979	2.100	5.693
		Phenobarbital	100	14	2.597	1.153	44.392	0.957	4.943
		Vehicle(0.25% methylcellulose)	0	15	3.997	1.075	26.890	1.286	6.271
4	**Final Body Weight (g)**	Linuron	50	15	349.067	20.821	5.965	318.000	385.000
		Linuron	100	15	321.800	24.644	7.658	278.000	358.000
		Linuron	150	14	309.000	12.848	4.158	290.000	339.000
		Phenobarbital	25	15	387.333	29.980	7.740	330.000	445.000
		Phenobarbital	50	15	380.667	20.635	5.421	349.000	424.000
		Phenobarbital	100	14	369.214	25.825	6.995	330.000	415.000
		Vehicle(0.25% methylcellulose)	0	15	388.333	23.942	6.165	328.000	433.000
5	**Food Consumption TD8-TD1 (g/kg/day)**	Linuron	10	14	62.786	9.133	14.546	43.000	72.000
		Linuron	20	14	48.286	8.119	16.814	38.000	62.000
		Linuron	30	13	45.846	11.639	25.388	27.000	63.000
		Phenobarbital	5	15	78.867	6.034	7.651	68.000	88.000
		Phenobarbital	10	14	79.929	7.087	8.867	66.000	96.000
		Phenobarbital	20	14	71.143	8.310	11.681	52.000	86.000
		Vehicle(0.25% methylcellulose)	0	15	76.067	2.492	3.276	72.000	81.000

WIL Adult Males
Descriptive Statistics

od	parm	Test Chemical	Dosage Level	N	Mean	Std	CV	Min	Max
6	**Food Consumption TD15-TD8 (g/kg/day)**	Linuron	10	14	68.857	10.098	14.666	53.000	86.000
		Linuron	20	15	62.467	6.632	10.617	49.000	77.000
		Linuron	30	14	55.071	6.989	12.690	45.000	64.000
		Phenobarbital	5	15	68.333	5.108	7.476	64.000	79.000
		Phenobarbital	10	14	67.786	4.228	6.237	61.000	78.000
		Phenobarbital	20	13	72.231	5.183	7.175	64.000	81.000
		Vehicle(0.25% methylcellulose)	0	14	68.500	4.942	7.215	62.000	82.000
7	**Food Consumption TD15-TD1 (g/kg/day)**	Linuron	10	13	65.231	7.585	11.627	49.000	73.000
		Linuron	20	14	54.786	5.977	10.909	46.000	65.000
		Linuron	30	13	50.077	5.454	10.891	43.000	63.000
		Phenobarbital	5	15	73.333	4.850	6.614	66.000	81.000
		Phenobarbital	10	13	72.538	4.176	5.756	64.000	81.000
		Phenobarbital	20	13	71.615	4.874	6.806	64.000	81.000
		Vehicle(0.25% methylcellulose)	0	14	72.143	3.035	4.206	68.000	78.000
8	**Liver Weight (g)**	Linuron	50	15	14.030	1.662	11.847	10.536	16.715
		Linuron	100	15	13.265	1.592	11.998	10.909	15.715
		Linuron	150	14	12.700	1.069	8.416	11.632	14.802
		Phenobarbital	25	15	17.347	1.913	11.030	15.018	22.393
		Phenobarbital	50	15	18.216	1.518	8.334	15.654	21.207
		Phenobarbital	100	14	19.819	2.791	14.084	14.681	25.668
		Vehicle(0.25% methylcellulose)	0	15	14.251	1.348	9.460	11.277	16.262
9	**Right Testis Weight (g)**	Linuron	50	15	1.687	0.151	8.946	1.460	2.005
		Linuron	100	15	1.589	0.102	6.397	1.351	1.702
		Linuron	150	14	1.636	0.088	5.380	1.461	1.788
		Phenobarbital	25	15	1.645	0.097	5.919	1.468	1.847
		Phenobarbital	50	15	1.667	0.180	10.830	1.381	2.056
		Phenobarbital	100	14	1.601	0.118	7.366	1.348	1.776
		Vehicle(0.25% methylcellulose)	0	15	1.668	0.094	5.619	1.493	1.815
10	**Left Testis Weight (g)**	Linuron	50	15	1.689	0.152	9.019	1.495	2.042
		Linuron	100	15	1.571	0.120	7.631	1.305	1.694
		Linuron	150	14	1.605	0.082	5.090	1.476	1.731
		Phenobarbital	25	15	1.645	0.111	6.771	1.452	1.907
		Phenobarbital	50	15	1.536	0.360	23.459	0.315	1.911
		Phenobarbital	100	14	1.607	0.110	6.829	1.387	1.752
		Vehicle(0.25% methylcellulose)	0	15	1.658	0.095	5.720	1.511	1.852

WIL Adult Males
Descriptive Statistics

od	parm	Test Chemical	Dosage Level	N	Mean	Std	CV	Min	Max
11	**Testes Paired Weight (g)**	Linuron	50	15	3.376	0.299	8.866	2.955	4.047
		Linuron	100	15	3.160	0.217	6.874	2.656	3.396
		Linuron	150	14	3.241	0.163	5.019	2.936	3.519
		Phenobarbital	25	15	3.290	0.204	6.204	2.920	3.754
		Phenobarbital	50	15	3.203	0.353	11.021	2.371	3.845
		Phenobarbital	100	14	3.208	0.224	6.976	2.735	3.528
		Vehicle(0.25% methylcellulose)	0	15	3.326	0.185	5.550	3.010	3.667
12	**Epididymides Weight (g)**	Linuron	50	15	0.967	0.047	4.908	0.899	1.068
		Linuron	100	15	0.903	0.075	8.319	0.716	1.017
		Linuron	150	14	0.947	0.083	8.761	0.792	1.090
		Phenobarbital	25	15	1.002	0.090	9.027	0.899	1.173
		Phenobarbital	50	15	1.023	0.095	9.242	0.832	1.143
		Phenobarbital	100	14	1.027	0.094	9.189	0.854	1.190
		Vehicle(0.25% methylcellulose)	0	15	1.007	0.102	10.084	0.848	1.153
13	**Entire Prostate Weight (g)**	Linuron	50	15	0.639	0.131	20.535	0.374	0.892
		Linuron	100	15	0.541	0.125	23.205	0.310	0.804
		Linuron	150	14	0.588	0.107	18.138	0.388	0.731
		Phenobarbital	25	15	0.803	0.167	20.759	0.482	1.136
		Phenobarbital	50	15	0.867	0.113	12.979	0.652	1.052
		Phenobarbital	100	14	0.809	0.129	15.928	0.552	0.962
		Vehicle(0.25% methylcellulose)	0	15	0.771	0.173	22.456	0.554	1.152
14	**Seminal Vesicles with Fluid and Coagulating Gland Weight (g)**	Linuron	50	15	1.365	0.272	19.923	0.899	1.828
		Linuron	100	15	1.182	0.286	24.183	0.567	1.557
		Linuron	150	14	1.261	0.309	24.501	0.805	1.748
		Phenobarbital	25	15	1.571	0.243	15.446	1.264	1.989
		Phenobarbital	50	15	1.686	0.189	11.225	1.385	2.036
		Phenobarbital	100	14	1.739	0.257	14.766	1.328	2.177
		Vehicle(0.25% methylcellulose)	0	15	1.648	0.220	13.335	1.244	2.013
15	**Accessory Sex Gland Weight (g)**	Linuron	50	15	2.004	0.314	15.669	1.478	2.467
		Linuron	100	15	1.723	0.385	22.344	0.924	2.296
		Linuron	150	14	1.849	0.385	20.835	1.193	2.413
		Phenobarbital	25	15	2.374	0.369	15.537	1.746	3.042
		Phenobarbital	50	15	2.553	0.248	9.722	2.111	2.878
		Phenobarbital	100	14	2.548	0.338	13.267	2.037	3.139
		Vehicle(0.25% methylcellulose)	0	15	2.419	0.309	12.778	1.818	2.908

WIL Adult Males
Descriptive Statistics

od	parm	Test Chemical	Dosage Level	N	Mean	Std	CV	Min	Max
16	**Thyroid Weight (g)**	Linuron	50	15	0.020	0.003	17.208	0.015	0.028
		Linuron	100	15	0.020	0.004	19.156	0.015	0.027
		Linuron	150	14	0.020	0.002	12.324	0.015	0.023
		Phenobarbital	25	15	0.026	0.003	11.001	0.021	0.031
		Phenobarbital	50	15	0.026	0.004	14.024	0.020	0.033
		Phenobarbital	100	14	0.026	0.004	13.467	0.019	0.030
		Vehicle(0.25% methylcellulose)	0	15	0.020	0.003	12.407	0.017	0.027
17	**Adjusted Liver Weight (%)**	Linuron	50	15	4.014	0.354	8.830	3.212	4.787
		Linuron	100	15	4.115	0.290	7.058	3.618	4.691
		Linuron	150	14	4.112	0.331	8.038	3.728	4.882
		Phenobarbital	25	15	4.474	0.251	5.604	4.027	5.032
		Phenobarbital	50	15	4.782	0.231	4.833	4.397	5.262
		Phenobarbital	100	14	5.348	0.450	8.420	4.449	6.185
		Vehicle(0.25% methylcellulose)	0	15	3.666	0.212	5.796	3.335	4.148
18	**Adjusted Right Testis Weight (%)**	Linuron	50	15	0.484	0.045	9.383	0.399	0.548
		Linuron	100	15	0.497	0.057	11.387	0.417	0.612
		Linuron	150	14	0.530	0.034	6.333	0.465	0.598
		Phenobarbital	25	15	0.426	0.026	6.161	0.369	0.464
		Phenobarbital	50	15	0.438	0.045	10.242	0.367	0.545
		Phenobarbital	100	14	0.435	0.031	7.162	0.385	0.492
		Vehicle(0.25% methylcellulose)	0	15	0.430	0.025	5.862	0.391	0.457
19	**Adjusted Left Testis Weight (%)**	Linuron	50	15	0.485	0.041	8.378	0.396	0.530
		Linuron	100	15	0.492	0.060	12.260	0.398	0.609
		Linuron	150	14	0.520	0.033	6.285	0.466	0.579
		Phenobarbital	25	15	0.426	0.028	6.524	0.362	0.468
		Phenobarbital	50	15	0.404	0.093	22.925	0.084	0.474
		Phenobarbital	100	14	0.436	0.029	6.634	0.392	0.485
		Vehicle(0.25% methylcellulose)	0	15	0.428	0.027	6.397	0.383	0.467
20	**Adjusted Testes Paired Weight (%)**	Linuron	50	15	0.969	0.085	8.776	0.796	1.074
		Linuron	100	15	0.989	0.116	11.725	0.815	1.222
		Linuron	150	14	1.050	0.064	6.129	0.931	1.177
		Phenobarbital	25	15	0.852	0.053	6.190	0.731	0.932
		Phenobarbital	50	15	0.842	0.084	9.974	0.629	0.954
		Phenobarbital	100	14	0.871	0.059	6.772	0.782	0.977
		Vehicle(0.25% methylcellulose)	0	15	0.858	0.052	6.027	0.775	0.924

WIL Adult Males
Descriptive Statistics

od	parm	Test Chemical	Dosage Level	N	Mean	Std	CV	Min	Max
21	**Adjusted Epididymides Weight (%)**	Linuron	50	15	0.278	0.022	7.992	0.245	0.317
		Linuron	100	15	0.282	0.030	10.771	0.222	0.332
		Linuron	150	14	0.307	0.027	8.930	0.265	0.364
		Phenobarbital	25	15	0.260	0.028	10.864	0.202	0.314
		Phenobarbital	50	15	0.269	0.028	10.520	0.221	0.326
		Phenobarbital	100	14	0.279	0.031	10.936	0.244	0.334
		Vehicle(0.25% methylcellulose)	0	15	0.260	0.025	9.621	0.216	0.299
22	**Adjusted Entire Prostate Weight (%)**	Linuron	50	15	0.184	0.041	22.449	0.104	0.257
		Linuron	100	15	0.168	0.036	21.471	0.096	0.242
		Linuron	150	14	0.190	0.032	16.973	0.130	0.240
		Phenobarbital	25	15	0.207	0.040	19.262	0.123	0.270
		Phenobarbital	50	15	0.229	0.034	14.942	0.167	0.293
		Phenobarbital	100	14	0.219	0.032	14.775	0.158	0.266
		Vehicle(0.25% methylcellulose)	0	15	0.199	0.044	22.126	0.141	0.300
23	**Adjusted Seminal Vesicles with Fluid and Coagulating Gland Weight (%)**	Linuron	50	15	0.392	0.084	21.307	0.258	0.559
		Linuron	100	15	0.367	0.084	22.997	0.191	0.476
		Linuron	150	14	0.406	0.090	22.086	0.269	0.541
		Phenobarbital	25	15	0.408	0.068	16.714	0.293	0.521
		Phenobarbital	50	15	0.444	0.052	11.635	0.366	0.532
		Phenobarbital	100	14	0.471	0.060	12.789	0.345	0.561
		Vehicle(0.25% methylcellulose)	0	15	0.426	0.062	14.442	0.318	0.530
24	**Adjusted Accessory Sex Gland Weight (%)**	Linuron	50	15	0.577	0.101	17.585	0.412	0.754
		Linuron	100	15	0.535	0.111	20.781	0.287	0.665
		Linuron	150	14	0.596	0.111	18.631	0.399	0.747
		Phenobarbital	25	15	0.615	0.097	15.749	0.445	0.767
		Phenobarbital	50	15	0.672	0.074	11.062	0.540	0.824
		Phenobarbital	100	14	0.690	0.076	11.066	0.545	0.827
		Vehicle(0.25% methylcellulose)	0	15	0.625	0.084	13.371	0.465	0.757
25	**Adjusted Thyroid Weight (%)**	Linuron	50	15	0.006	0.001	16.959	0.004	0.008
		Linuron	100	15	0.006	0.001	16.193	0.005	0.008
		Linuron	150	14	0.006	0.001	10.704	0.005	0.007
		Phenobarbital	25	15	0.007	0.001	16.002	0.005	0.009
		Phenobarbital	50	15	0.007	0.001	13.852	0.005	0.009
		Phenobarbital	100	14	0.007	0.001	10.993	0.006	0.008
		Vehicle(0.25% methylcellulose)	0	15	0.005	0.001	12.732	0.004	0.007

WIL Adult Males
Descriptive Statistics

od	parm	Test Chemical	Dosage Level	N	Mean	Std	CV	Min	Max
26	**Testosterone (ng/ml)**	Linuron	50	15	6.317	4.459	70.587	0.720	14.738
		Linuron	100	15	6.225	5.775	92.768	0.100	21.791
		Linuron	150	14	4.102	4.320	105.299	0.245	14.311
		Phenobarbital	25	15	4.475	2.343	52.360	0.615	7.993
		Phenobarbital	50	15	3.501	3.047	87.008	0.547	10.557
		Phenobarbital	100	14	2.870	2.364	82.359	0.255	8.131
		Vehicle	0	15	6.137	3.679	59.943	1.865	15.484
27	**LH (ng/ml)**	Linuron	50	15	0.880	0.475	54.022	0.400	1.800
		Linuron	100	15	0.667	0.435	65.301	0.400	1.700
		Linuron	150	14	0.629	0.389	61.908	0.400	1.400
		Phenobarbital	25	15	0.647	0.350	54.161	0.400	1.500
		Phenobarbital	50	15	0.560	0.241	43.111	0.400	1.000
		Phenobarbital	100	14	0.779	0.370	47.575	0.400	1.400
		Vehicle	0	15	0.693	0.353	50.984	0.400	1.300
28	**TSH (ng/ml)**	Linuron	50	15	13.947	4.778	34.262	8.200	25.000
		Linuron	100	15	12.247	5.535	45.199	7.500	29.500
		Linuron	150	14	11.386	5.435	47.734	5.800	24.100
		Phenobarbital	25	15	24.013	9.584	39.911	11.100	41.500
		Phenobarbital	50	15	25.833	10.443	40.425	10.800	44.800
		Phenobarbital	100	14	31.857	12.606	39.570	12.300	61.000
		Vehicle	0	15	15.393	6.572	42.691	7.900	31.100
29	**T4 (ug/dl)**	Linuron	50	15	2.687	0.889	33.079	1.200	4.900
		Linuron	100	15	1.287	0.793	61.609	0.300	3.200
		Linuron	150	14	0.521	0.239	45.866	0.100	0.900
		Phenobarbital	25	15	4.133	1.134	27.443	2.400	6.700
		Phenobarbital	50	15	2.893	0.573	19.788	1.600	3.600
		Phenobarbital	100	14	1.707	0.762	44.639	0.400	2.900
		Vehicle	0	15	4.973	0.840	16.899	3.000	6.100
30	**T3 (ng/dl)**	Linuron	50	15	78.627	13.923	17.707	53.000	103.200
		Linuron	100	15	69.873	12.852	18.394	48.400	85.400
		Linuron	150	14	66.943	11.622	17.361	47.400	85.000
		Phenobarbital	25	15	72.040	9.429	13.088	56.300	86.800
		Phenobarbital	50	15	62.773	10.691	17.032	45.000	79.000
		Phenobarbital	100	14	57.086	7.054	12.357	40.600	69.900
		Vehicle	0	15	79.993	10.352	12.941	65.100	100.300
31	**FSH (ng/ml)**	Linuron	50	15	15.733	1.836	11.667	12.100	18.000
		Linuron	100	15	16.573	4.213	25.422	9.500	23.000
		Linuron	150	14	15.200	2.780	18.289	11.200	21.300

WIL Adult Males
Descriptive Statistics

od	parm	Test Chemical	Dosage Level	N	Mean	Std	CV	Min	Max
		Phenobarbital	25	15	11.033	1.729	15.675	8.200	14.500
		Phenobarbital	50	15	11.187	2.611	23.337	7.800	17.400
		Phenobarbital	100	14	11.736	2.272	19.358	9.100	18.000
		Vehicle	0	15	13.133	2.279	17.355	9.900	18.400
32	**Estradiol (pg/ml)**	Linuron	50	13	44.123	12.593	28.540	28.000	72.800
		Linuron	100	15	57.000	41.495	72.798	29.100	196.100
		Linuron	150	13	52.546	28.609	54.445	33.900	142.100
		Phenobarbital	25	15	41.553	14.675	35.315	10.000	77.500
		Phenobarbital	50	14	48.836	21.840	44.720	30.100	118.900
		Phenobarbital	100	14	89.600	117.594	131.243	44.100	495.900
		Vehicle	0	15	38.353	21.969	57.280	20.600	105.900
33	**Prolactin (ng/ml)**	Linuron	50	13	3.115	4.228	135.728	0.400	16.300
		Linuron	100	11	2.009	0.925	46.021	0.900	3.800
		Linuron	150	9	1.611	0.725	45.021	0.400	3.100
		Phenobarbital	25	11	2.291	1.339	58.448	0.800	5.200
		Phenobarbital	50	11	2.427	2.217	91.329	0.800	8.600
		Phenobarbital	100	9	2.211	2.520	113.954	1.000	8.900
		Vehicle	0	11	2.936	1.487	50.657	1.000	5.000
34	**DHT (pg/ml)**	Linuron	50	15	161.047	129.990	80.716	15.000	564.500
		Linuron	100	15	211.440	181.072	85.638	42.400	671.200
		Linuron	150	14	170.764	192.810	112.910	15.000	669.100
		Phenobarbital	25	15	141.627	71.459	50.456	37.800	253.500
		Phenobarbital	50	15	126.987	123.714	97.423	35.300	513.300
		Phenobarbital	100	14	99.571	67.964	68.256	32.000	229.700
		Vehicle	0	15	225.607	153.565	68.067	62.700	549.200

APPENDIX H

Summary Animal Data

This appendix presents the data from "Inter-Laboratory Validation of the 15-Day Adult Intact Male Rat Assay With Linuron and Phenobarbital (WA 5-15)". Due to software spacing constraints, the study title is presented as "Inter-Lab 15-Day Male Rat Assay With Linuron & Phenobarbital" on the appendix tables, and some table titles have been shortened due to software spacing constraints. Data are presented without the results of statistical analyses.

DETAILED PHYSICAL EXAMINATIONS

PROJECT NO.:WIL-431014 INTER-LAB 15-DAY MALE RAT ASSAY WITH LINURON & PHENOBARBITAL
SPONSOR:BATTELLE SUMMARY OF CLINICAL FINDINGS: TOTAL OCCURRENCE/NO. OF ANIMALS
SPONSOR NO.:68-W-01-023

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

TABLE RANGE:	10-24-05 TO 11-09-05						
GROUP:	1	2	3	4	5	6	7
NORMAL							
-NO SIGNIFICANT CLINICAL OBSERVATIONS	225/15	199/15	164/15	129/14	215/15	214/15	159/15
DISPOSITION							
-FOUND DEAD	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	1/ 1
-EUTHANIZED IN EXTREMIS	0/ 0	0/ 0	0/ 0	1/ 1	0/ 0	0/ 0	0/ 0
-SCHEDULED EUTHANASIA	15/15	15/15	15/15	14/14	15/15	15/15	14/14
BODY/INTEGUMENT							
-HAIR LOSS RIGHT FORELIMB	0/ 0	17/ 2	9/ 1	1/ 1	2/ 1	9/ 2	0/ 0
-HAIR LOSS LEFT FORELIMB	0/ 0	16/ 2	9/ 1	1/ 1	2/ 1	8/ 1	0/ 0
-UNKEMPT APPEARANCE	0/ 0	0/ 0	0/ 0	5/ 2	0/ 0	0/ 0	0/ 0
-HAIR LOSS VENTRAL ABDOMINAL AREA	0/ 0	4/ 1	45/ 4	52/ 5	0/ 0	0/ 0	0/ 0
-HAIR LOSS RUMP	0/ 0	0/ 0	2/ 2	15/ 3	0/ 0	0/ 0	0/ 0
-HAIR LOSS RIGHT HINDLIMB	0/ 0	0/ 0	28/ 4	45/ 5	0/ 0	0/ 0	0/ 0
-HAIR LOSS LEFT HINDLIMB	0/ 0	0/ 0	28/ 4	44/ 5	0/ 0	0/ 0	0/ 0
-HAIR LOSS UROGENITAL AREA	0/ 0	0/ 0	10/ 4	21/ 4	0/ 0	0/ 0	0/ 0
-HAIR LOSS VENTRAL THORACIC AREA	0/ 0	0/ 0	16/ 4	21/ 3	0/ 0	0/ 0	0/ 0
-HAIR LOSS ANOGENITAL AREA	0/ 0	0/ 0	0/ 0	21/ 4	0/ 0	0/ 0	0/ 0
-HAIR LOSS DORSAL NECK	0/ 0	0/ 0	0/ 0	0/ 0	2/ 1	0/ 0	0/ 0
-WET YELLOW MATERIAL UROGENITAL AREA	0/ 0	0/ 0	1/ 1	0/ 0	0/ 0	0/ 0	2/ 1
-HAIR LOSS BASE OF TAIL	0/ 0	0/ 0	0/ 0	21/ 4	0/ 0	0/ 0	0/ 0

1-METHYLCELLULOSE 2- 50 MG LINURON 3- 100 MG LINURON 4- 150 MG LINURON 5- 25 MG PHENO 6- 50 MG PHENO
7- 100 MG PHENO

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

TABLE RANGE:	10-24-05 TO 11-09-05						
GROUP:	1	2	3	4	5	6	7
BODY/INTEGUMENT							
-DRIED YELLOW MATERIAL UROGENITAL AREA	0/ 0	0/ 0	0/ 0	1/ 1	0/ 0	0/ 0	1/ 1
-BODY COOL TO TOUCH	0/ 0	0/ 0	0/ 0	1/ 1	0/ 0	0/ 0	1/ 1
-HAIR LOSS RIGHT LATERAL ABDOMINAL AREA	0/ 0	0/ 0	2/ 1	1/ 1	0/ 0	0/ 0	0/ 0
-PROSTRATE	0/ 0	0/ 0	0/ 0	1/ 1	0/ 0	0/ 0	0/ 0
-UNCONSCIOUS AND UNRESPONSIVE	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	1/ 1
-LATERAL RECUMBENCY	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	1/ 1
CARDIO-PULMONARY							
-RALES	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	1/ 1
EYES/EARS/NOSE							
-DRIED RED MATERIAL AROUND NOSE	0/ 0	6/ 3	0/ 0	22/ 7	1/ 1	2/ 2	14/ 8
-DRIED RED MATERIAL AROUND LEFT EYE	0/ 0	0/ 0	0/ 0	9/ 4	1/ 1	0/ 0	36/12
-DRIED RED MATERIAL AROUND RIGHT EYE	0/ 0	0/ 0	0/ 0	27/ 4	5/ 1	0/ 0	35/10
-LACRIMATION RIGHT EYE	0/ 0	0/ 0	0/ 0	1/ 1	0/ 0	0/ 0	0/ 0
-WET RED MATERIAL AROUND RIGHT EYE	0/ 0	0/ 0	0/ 0	1/ 1	0/ 0	0/ 0	0/ 0
EXCRETA							
-DECREASED DEFECATION	0/ 0	0/ 0	3/ 2	8/ 7	0/ 0	0/ 0	2/ 1
-SOFT STOOL	0/ 0	0/ 0	1/ 1	0/ 0	0/ 0	0/ 0	0/ 0
ORAL/DENTAL							
-DRIED RED MATERIAL AROUND MOUTH	0/ 0	0/ 0	0/ 0	3/ 2	0/ 0	0/ 0	0/ 0

1-METHYLCELLULOSE 2- 50 MG LINURON 3- 100 MG LINURON 4- 150 MG LINURON 5- 25 MG PHENO 6- 50 MG PHENO
7- 100 MG PHENO

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

TABLE RANGE:	10-24-05 TO 11-09-05						
GROUP:	1	2	3	4	5	6	7
ORAL/DENTAL							
-WET CLEAR MATERIAL AROUND MOUTH	0/ 0	0/ 0	0/ 0	1/ 1	0/ 0	0/ 0	0/ 0

1-METHYLCELLULOSE 2- 50 MG LINURON 3- 100 MG LINURON 4- 150 MG LINURON 5- 25 MG PHENO 6- 50 MG PHENO
7- 100 MG PHENO

6 HOURS POST-DOSING

PROJECT NO.:WIL-431014 INTER-LAB 15-DAY MALE RAT ASSAY WITH LINURON & PHENOBARBITAL PAGE 1
SPONSOR:BATTELLE SUMMARY OF CLINICAL FINDINGS: TOTAL OCCURRENCE/NO. OF ANIMALS
SPONSOR NO.:68-W-01-023

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

TABLE RANGE:	10-24-05 TO 11-09-05						
GROUP:	1	2	3	4	5	6	7
BEHAVIOR/CNS							
-IMPAIRED MOBILITY	0/ 0	0/ 0	0/ 0	47/13	0/ 0	0/ 0	161/15
-LYING ON SIDE; LIMBS EXTENDED	0/ 0	0/ 0	0/ 0	4/ 4	0/ 0	0/ 0	49/15
-PILOERECTION	0/ 0	0/ 0	0/ 0	3/ 3	0/ 0	0/ 0	0/ 0
-ROCKS, LURCHES, OR SWAYS AS IT WALKS	0/ 0	0/ 0	0/ 0	27/10	0/ 0	0/ 0	65/14
-HYPOACTIVITY	0/ 0	0/ 0	0/ 0	31/10	0/ 0	0/ 0	99/14
BODY/INTEGUMENT							
-DRIED YELLOW MATERIAL UROGENITAL AREA	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	1/ 1
-BODY COOL TO TOUCH	0/ 0	0/ 0	0/ 0	1/ 1	0/ 0	0/ 0	0/ 0
CARDIO-PULMONARY							
-SHALLOW RESPIRATION	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	1/ 1
EYES/EARS/NOSE							
-LACRIMATION LEFT EYE	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	1/ 1
-LACRIMATION RIGHT EYE	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	0/ 0	1/ 1
-WET RED MATERIAL AROUND RIGHT EYE	0/ 0	0/ 0	0/ 0	1/ 1	0/ 0	0/ 0	0/ 0
-WET RED MATERIAL AROUND LEFT EYE	0/ 0	0/ 0	0/ 0	1/ 1	0/ 0	0/ 0	0/ 0

1-METHYLCELLULOSE 2- 50 MG LINURON 3- 100 MG LINURON 4- 150 MG LINURON 5- 25 MG PHENO 6- 50 MG PHENO
7- 100 MG PHENO

PCSUv4.07
11/30/2005
R:12/01/2005

SPONSOR:BATTELLE SUMMARY OF BODY WEIGHTS [G]
SPONSOR NO.:68-W-01-023

MALES

GROUP:	METHYLCELLULOSE	50 MG LINURON	100 MG LINURON	150 MG LINURON	25 MG PHENO	50 MG PHENO	100 MG PHENO
DAY 1							
MEAN	332.	333.	332.	330.	331.	330.	333.
S.D.	12.2	13.1	11.4	17.7	12.9	9.4	12.7
N	15	15	15	15	15	15	15
DAY 2							
MEAN	338.	324.	316.	311.	341.	340.	334.
S.D.	14.7	13.0	12.0	13.8	13.9	9.9	15.2
N	15	15	15	15	15	15	15
DAY 3							
MEAN	342.	319.	313.	303.	345.	345.	322.
S.D.	14.9	13.3	18.7	19.5	16.1	10.3	21.9
N	15	15	15	15	15	15	15
DAY 4							
MEAN	347.	320.	307.	292.	349.	349.	326.
S.D.	16.1	15.2	18.4	14.4	17.3	13.5	24.2
N	15	15	15	15	15	15	14
DAY 5							
MEAN	351.	322.	297.	294.	351.	352.	331.
S.D.	16.8	14.5	22.7	17.9	20.4	13.5	24.6
N	15	15	15	15	15	15	14
DAY 6							
MEAN	355.	333.	304.	299.	356.	354.	336.
S.D.	17.1	13.0	20.7	13.4	21.7	13.3	22.6
N	15	15	15	14	15	15	14

MALES

GROUP:	METHYLCELLULOSE	50 MG LINURON	100 MG LINURON	150 MG LINURON	25 MG PHENO	50 MG PHENO	100 MG PHENO
DAY 7							
MEAN	359.	326.	305.	301.	359.	357.	341.
S.D.	18.0	13.9	21.0	14.1	22.9	14.5	20.8
N	15	15	15	14	15	15	14
DAY 8							
MEAN	364.	326.	306.	299.	362.	358.	342.
S.D.	18.8	13.7	22.0	15.0	24.0	16.5	19.5
N	15	15	15	14	15	15	14
DAY 9							
MEAN	368.	328.	305.	297.	367.	361.	347.
S.D.	20.2	18.6	22.4	12.3	23.4	16.0	20.4
N	15	15	15	14	15	15	14
DAY 10							
MEAN	372.	333.	307.	295.	371.	364.	351.
S.D.	20.9	15.8	21.6	13.5	24.9	18.1	22.6
N	15	15	15	14	15	15	14
DAY 11							
MEAN	376.	335.	308.	297.	374.	368.	354.
S.D.	22.6	18.5	25.7	15.0	25.8	18.9	23.8
N	15	15	15	14	15	15	14
DAY 12							
MEAN	380.	341.	311.	299.	378.	370.	358.
S.D.	22.6	17.8	26.8	19.5	26.2	19.6	24.6
N	15	15	15	14	15	15	14

MALES

GROUP:	METHYLCELLULOSE	50 MG LINURON	100 MG LINURON	150 MG LINURON	25 MG PHENO	50 MG PHENO	100 MG PHENO
DAY 13							
MEAN	383.	342.	313.	305.	381.	374.	361.
S.D.	22.3	18.3	26.0	14.6	27.5	19.9	24.4
N	15	15	15	14	15	15	14
DAY 14							
MEAN	384.	346.	318.	305.	382.	376.	365.
S.D.	22.9	19.7	24.5	15.4	28.9	19.5	25.5
N	15	15	15	14	15	15	14
DAY 15							
MEAN	388.	349.	322.	309.	387.	381.	369.
S.D.	23.9	20.8	24.6	12.8	30.0	20.6	25.8
N	15	15	15	14	15	15	14

MALES

GROUP:	METHYLCELLULOSE	50 MG LINURON	100 MG LINURON	150 MG LINURON	25 MG PHENO	50 MG PHENO	100 MG PHENO
DAY 1- 2							
MEAN	6.	-9.	-16.	-19.	10.	10.	1.
S.D.	4.4	6.1	5.8	8.8	2.9	5.3	7.3
N	15	15	15	15	15	15	15
DAY 2- 3							
MEAN	4.	-4.	-3.	-7.	4.	5.	-12.
S.D.	3.9	5.2	10.7	13.3	3.4	2.9	11.1
N	15	15	15	15	15	15	15
DAY 3- 4							
MEAN	5.	1.	-6.	-11.	4.	4.	2.
S.D.	3.2	5.8	15.6	13.4	3.5	3.9	6.5
N	15	15	15	15	15	15	14
DAY 4- 5							
MEAN	5.	2.	-9.	2.	2.	3.	5.
S.D.	3.2	5.9	18.5	12.3	5.6	3.5	5.6
N	15	15	15	15	15	15	14
DAY 5- 6							
MEAN	4.	11.	7.	4.	5.	2.	5.
S.D.	3.3	8.9	14.9	13.1	4.1	2.5	5.0
N	15	15	15	14	15	15	14
DAY 6- 7							
MEAN	4.	-7.	1.	2.	3.	4.	5.
S.D.	3.4	8.9	9.4	7.0	3.4	2.8	4.1
N	15	15	15	14	15	15	14

MEAN DIFFERENCES CALCULATED FROM INDIVIDUAL DIFFERENCES

MALES

GROUP:	METHYLCELLULOSE	50 MG LINURON	100 MG LINURON	150 MG LINURON	25 MG PHENO	50 MG PHENO	100 MG PHENO
DAY 7- 8							
MEAN	4.	0.	1.	-2.	3.	1.	2.
S.D.	3.8	3.7	9.6	5.1	3.8	3.4	4.1
N	15	15	15	14	15	15	14
DAY 8- 9							
MEAN	4.	3.	-1.	-2.	5.	3.	4.
S.D.	3.4	9.8	8.3	8.1	3.2	4.1	4.4
N	15	15	15	14	15	15	14
DAY 9- 10							
MEAN	4.	4.	2.	-2.	4.	4.	4.
S.D.	4.0	8.4	8.7	4.2	3.0	3.0	3.9
N	15	15	15	14	15	15	14
DAY 10- 11							
MEAN	4.	3.	1.	2.	3.	4.	4.
S.D.	3.0	4.4	8.5	4.7	3.3	3.8	3.9
N	15	15	15	14	15	15	14
DAY 11- 12							
MEAN	4.	5.	3.	3.	5.	2.	4.
S.D.	2.5	4.2	5.2	6.6	1.9	2.3	2.3
N	15	15	15	14	15	15	14
DAY 12- 13							
MEAN	3.	2.	2.	5.	2.	3.	3.
S.D.	3.1	5.7	7.7	10.0	3.6	1.5	2.4
N	15	15	15	14	15	15	14

MEAN DIFFERENCES CALCULATED FROM INDIVIDUAL DIFFERENCES

MALES

GROUP:	METHYLCELLULOSE	50 MG LINURON	100 MG LINURON	150 MG LINURON	25 MG PHENO	50 MG PHENO	100 MG PHENO
DAY 13- 14							
MEAN	2.	4.	5.	0.	1.	3.	4.
S.D.	2.6	3.5	5.2	7.1	3.3	2.0	1.6
N	15	15	15	14	15	15	14
DAY 14- 15							
MEAN	4.	3.	4.	4.	5.	4.	4.
S.D.	2.6	5.0	5.5	7.1	3.1	2.0	5.6
N	15	15	15	14	15	15	14
DAY 1- 8							
MEAN	32.	-7.	-26.	-29.	31.	28.	9.
S.D.	9.0	12.0	18.6	19.9	14.6	10.9	11.5
N	15	15	15	14	15	15	14
DAY 8- 15							
MEAN	24.	23.	16.	10.	25.	22.	27.
S.D.	7.3	12.4	8.4	8.2	8.9	8.0	9.9
N	15	15	15	14	15	15	14
DAY 1- 15							
MEAN	56.	17.	-10.	-19.	57.	51.	36.
S.D.	15.0	16.8	21.0	15.9	21.3	16.7	16.1
N	15	15	15	14	15	15	14

MEAN DIFFERENCES CALCULATED FROM INDIVIDUAL DIFFERENCES

MALES

GROUP:	METHYLCELLULOSE	50 MG LINURON	100 MG LINURON	150 MG LINURON	25 MG PHENO	50 MG PHENO	100 MG PHENO
DAY 1- 8							
MEAN	76.	63.	48.	46.	79.	80.	71.
S.D.	2.6	9.0	8.1	11.6	6.0	7.0	8.2
N	15	14	14	13	15	14	14
DAY 8- 15							
MEAN	68.	69.	62.	55.	68.	68.	72.
S.D.	4.8	10.0	6.7	6.8	5.1	4.3	5.2
N	14	14	15	14	15	14	13
DAY 1- 15							
MEAN	72.	65.	55.	50.	73.	73.	72.
S.D.	3.0	7.6	5.9	5.6	4.9	4.0	4.9
N	14	13	14	13	15	13	13

FOUND DEAD OR EUTHANIZED MORIBUND OR IN EXTREMIS

	M A L E						
GROUP:	1	2	3	4	5	6	7
NUMBER OF ANIMALS IN DOSE GROUP	15	15	15	15	15	15	15
NUMBER OF ANIMALS EXAMINED	0	0	0	1	0	0	1
SKIN							
-MATTING, YELLOW	0	0	0	0	0	0	1
STOMACH							
-CONTENTS, YELLOW	0	0	0	0	0	0	1
URINARY BLADDER							
-DISTENDED	0	0	0	0	0	0	1
NO SIGNIFICANT CHANGES OBSERVED - ALL EXAMINED TISSUES	0	0	0	1	0	0	0

1-METHYLCELLULOSE 2- 50 MG LINURON 3- 100 MG LINURON 4- 150 MG LINURON 5- 25 MG PHENO 6- 50 MG PHENO
7- 100 MG PHENO

SCHEDULED EUTHANASIA

PROJECT NO.:WIL-431014 INTER-LAB 15-DAY MALE RAT ASSAY WITH LINURON & PHENOBARBITAL

SPONSOR:BATTELLE SUMMARY OF MACROSCOPIC FINDINGS

SPONSOR NO.:68-W-01-023

SCHEDULED NECROPSY

	MALE						
GROUP:	1	2	3	4	5	6	7
NUMBER OF ANIMALS IN DOSE GROUP	15	15	15	15	15	15	15
NUMBER OF ANIMALS EXAMINED	15	15	15	14	15	15	14
EPIDIDYMIDES							
-SMALL	0	0	0	0	0	1	0
KIDNEYS							
-DILATED PELVIS	0	0	0	1	0	0	0
TESTIS, LT							
-SMALL	0	0	0	0	0	1	0
PROSTATE							
-SMALL	0	0	1	0	0	0	0
SKIN							
-HAIR LOSS	0	0	1	2	0	0	0
SPLEEN							
-ENLARGED	0	0	0	0	0	0	1
-AREA(S), WHITE	0	0	1	0	0	0	0
SEMINAL VESICLES							
-SMALL	0	2	4	3	0	0	0
-SOFT	0	0	1	0	0	0	0
COAGULATING GL							
-ENLARGED	0	1	0	0	0	0	1
NO SIGNIFICANT CHANGES OBSERVED - ALL EXAMINED TISSUES	15	13	9	8	15	14	12

1-METHYLCELLULOSE 2- 50 MG LINURON 3- 100 MG LINURON 4- 150 MG LINURON 5- 25 MG PHENO 6- 50 MG PHENO
7- 100 MG PHENO

PGRSI2v4.05
12/29/2005

SPONSOR:BATTELLE SUMMARY OF SERUM HORMONE VALUES
SPONSOR NO.:68-W-01-023

MALES

ANALYSIS	GROUP:	METHYLCELLULOSE	50 MG LINURON	100 MG LINURON	150 MG LINURON	25 MG PHENO	50 MG PHENO	100 MG PHENO
TESTOS TERONE (ng/dL)								
DAY 15	MEAN	613.7	631.7	622.5	410.2	447.5	350.1	287.0
	S.D.	367.88	445.89	577.49	431.98	234.29	304.65	236.36
	N	15	15	15	14	15	15	14
LUTEIN' HORMONE (ng/ml)								
DAY 15	MEAN	0.7	0.9	0.7	0.6	0.6	0.6	0.8
	S.D.	0.35	0.48	0.44	0.39	0.35	0.24	0.37
	N	15	15	15	14	15	15	14
TSH (ng/ml)								
DAY 15	MEAN	15.4	13.9	12.2	11.4	24.0	25.8	31.9
	S.D.	6.57	4.78	5.54	5.43	9.58	10.44	12.61
	N	15	15	15	14	15	15	14
TOTAL T4 (uG/dl)								
DAY 15	MEAN	4.97	2.69	1.29	0.52	4.13	2.89	1.71
	S.D.	0.840	0.889	0.793	0.239	1.134	0.573	0.762
	N	15	15	15	14	15	15	14
TOTAL T3 (ng/dL)								
DAY 15	MEAN	79.99	78.63	69.87	66.94	72.04	62.77	57.09
	S.D.	10.352	13.923	12.852	11.622	9.429	10.691	7.054
	N	15	15	15	14	15	15	14

ng/ml = NANOGRAMS/MILLILITER, ng/dL = NANOGRAMS/DECILITER, pg/ml = PICOGRAMS/MILLILITER,
uG/dl =MICROGRAMS/DECILITER

MALES

ANALYSIS	GROUP:	METHYLCELLULOSE	50 MG LINURON	100 MG LINURON	150 MG LINURON	25 MG PHENO	50 MG PHENO	100 MG PHENO
FSH (ng/ml)								
DAY 15	MEAN	13.1	15.7	16.6	15.2	11.0	11.2	11.7
	S.D.	2.28	1.84	4.21	2.78	1.73	2.61	2.27
	N	15	15	15	14	15	15	14
ESTRA DIOL (pg/ml)								
DAY 15	MEAN	38.35	44.12	57.00	52.55	41.55	48.84	89.60
	S.D.	21.969	12.593	41.495	28.609	14.675	21.840	117.594
	N	15	13	15	13	15	14	14
PRO LACTIN (ng/ml) -A								
DAY 15	MEAN	2.9	3.1	2.0	1.6	2.3	2.4	2.2
	S.D.	1.49	4.23	0.92	0.73	1.34	2.22	2.52
	N	11	13	11	9	11	11	9
DHT (pg/ml)								
DAY 15	MEAN	225.6	161.0	211.4	170.8	141.6	127.0	99.6
	S.D.	153.56	129.99	181.07	192.81	71.46	123.71	67.96
	N	15	15	15	14	15	15	14

ng/ml = NANOGRAMS/MILLILITER, ng/dL = NANOGRAMS/DECILITER, pg/ml = PICOGRAMS/MILLILITER,
uG/dl = MICROGRAMS/DECILITER

A = SAMPLES REASSAYED AT GREATER VOLUME (100 uL) THAN ORIGINAL ASSAY (50 uL); NOT ALL SAMPLES REASSAYED DUE TO LACK OF RIA KIT MATERIALS.

SPONSOR:BATTELLE SUMMARY OF ORGAN WEIGHTS [G]
SPONSOR NO.:68-W-01-023

MALES

GROUP:	METHYLCELLULOSE	50 MG LINURON	100 MG LINURON	150 MG LINURON	25 MG PHENO	50 MG PHENO	100 MG PHENO
LIVER (G)							
MEAN	14.2506	14.0304	13.2649	12.6998	17.3472	18.2159	19.8189
S.D.	1.34813	1.66219	1.59152	1.06881	1.91348	1.51814	2.79138
N	15	15	15	14	15	15	14
SEM VES/CG/FLUID (G)							
MEAN	1.6483	1.3646	1.1824	1.2609	1.5709	1.6862	1.7389
S.D.	0.21981	0.27186	0.28593	0.30893	0.24264	0.18928	0.25676
N	15	15	15	14	15	15	14
PROSTATE (G)							
MEAN	0.7707	0.6394	0.5408	0.5883	0.8030	0.8668	0.8089
S.D.	0.17307	0.13129	0.12549	0.10670	0.16670	0.11250	0.12884
N	15	15	15	14	15	15	14
EPIDIDYMIDES (G)							
MEAN	1.0071	0.9671	0.9029	0.9473	1.0016	1.0234	1.0273
S.D.	0.10155	0.04746	0.07511	0.08299	0.09041	0.09459	0.09439
N	15	15	15	14	15	15	14
TESTIS, RT (G)							
MEAN	1.6675	1.6869	1.5888	1.6365	1.6446	1.6665	1.6015
S.D.	0.09370	0.15091	0.10164	0.08805	0.09735	0.18049	0.11796
N	15	15	15	14	15	15	14

MALES

GROUP:	METHYLCELLULOSE	50 MG LINURON	100 MG LINURON	150 MG LINURON	25 MG PHENO	50 MG PHENO	100 MG PHENO
TESTIS, LT (G)							
MEAN	1.6580	1.6889	1.5708	1.6048	1.6449	1.5363	1.6066
S.D.	0.09483	0.15233	0.11987	0.08168	0.11138	0.36041	0.10971
N	15	15	15	14	15	15	14
THYROID GLANDS (G)							
MEAN	0.0202	0.0201	0.0199	0.0195	0.0262	0.0265	0.0261
S.D.	0.00251	0.00346	0.00381	0.00241	0.00288	0.00371	0.00352
N	15	15	15	14	15	15	14

PROJECT NO.:WIL-431014 INTER-LAB 15-DAY MALE RAT ASSAY WITH LINURON & PHENOBARBITAL PAGE 1
SPONSOR:BATTELLE SUMMARY OF ORGAN WTS. RELATIVE TO FINAL BODY WTS. [G/100 G]
SPONSOR NO.:68-W-01-023

MALES

GROUP:	METHYLCELLULOSE	50 MG LINURON	100 MG LINURON	150 MG LINURON	25 MG PHENO	50 MG PHENO	100 MG PHENO
FINAL BODY WT (G)							
MEAN	388.	349.	322.	309.	387.	381.	369.
S.D.	23.9	20.8	24.6	12.8	30.0	20.6	25.8
N	15	15	15	14	15	15	14
LIVER							
MEAN	3.666	4.014	4.115	4.112	4.474	4.782	5.348
S.D.	0.2124	0.3544	0.2904	0.3306	0.2507	0.2312	0.4503
N	15	15	15	14	15	15	14
SEM VES/CG/FLUID							
MEAN	0.426	0.392	0.367	0.406	0.408	0.444	0.471
S.D.	0.0615	0.0836	0.0843	0.0898	0.0682	0.0517	0.0604
N	15	15	15	14	15	15	14
PROSTATE							
MEAN	0.199	0.184	0.168	0.190	0.208	0.229	0.219
S.D.	0.0439	0.0413	0.0360	0.0322	0.0400	0.0342	0.0323
N	15	15	15	14	15	15	14
EPIDIDYMIDES							
MEAN	0.260	0.278	0.282	0.307	0.260	0.270	0.279
S.D.	0.0250	0.0222	0.0305	0.0273	0.0282	0.0284	0.0304
N	15	15	15	14	15	15	14

MALES

GROUP:	METHYLCELLULOSE	50 MG LINURON	100 MG LINURON	150 MG LINURON	25 MG PHENO	50 MG PHENO	100 MG PHENO
TESTIS, RT							
MEAN	0.430	0.484	0.497	0.530	0.426	0.438	0.435
S.D.	0.0252	0.0454	0.0565	0.0336	0.0264	0.0449	0.0311
N	15	15	15	14	15	15	14
TESTIS, LT							
MEAN	0.428	0.485	0.492	0.520	0.426	0.404	0.436
S.D.	0.0276	0.0407	0.0602	0.0327	0.0278	0.0924	0.0290
N	15	15	15	14	15	15	14
THYROID GLANDS							
MEAN	0.005	0.006	0.006	0.006	0.007	0.007	0.007
S.D.	0.0008	0.0010	0.0011	0.0006	0.0011	0.0010	0.0008
N	15	15	15	14	15	15	14

----- MALE -----

GROUP:	1	2	3	4	5	6	7
NUMBER OF ANIMALS IN DOSE GROUP	15	15	15	15	15	15	15
NUMBER OF ANIMALS EXAMINED	15	0	0	14	0	0	14
EPIDIDYMIDES							
TOTAL NUMBER EXAMINED	15	NA	NA	14	NA	NA	14
EXAMINED, UNREMARKABLE	3	NA	NA	2	NA	NA	0
-INFILTRATE, MONONUCLEAR	12	NA	NA	12	NA	NA	14
-LUMINAL DEBRIS, CELLULAR	0	NA	NA	3	NA	NA	2
THYROID GLANDS							
TOTAL NUMBER EXAMINED	15	NA	NA	14	NA	NA	14
EXAMINED, UNREMARKABLE	0	NA	NA	0	NA	NA	0
-FOLLICULAR EPITHELIAL HEIGHT	15	NA	NA	14	NA	NA	14
-COLLOID AREA	15	NA	NA	14	NA	NA	14
-CYST, ULTIMOBRANCHIAL	12	NA	NA	10	NA	NA	11
-MITOTIC FIGURES	5	NA	NA	3	NA	NA	14
-INFLAMMATION, ACUTE	0	NA	NA	1	NA	NA	0
TESTES							
TOTAL NUMBER EXAMINED	15	NA	NA	14	NA	NA	14
EXAMINED, UNREMARKABLE	14	NA	NA	12	NA	NA	8
-DEGENERATION, SEMINIFEROUS TUBULES	1	NA	NA	0	NA	NA	2
-RETENTION, SPERMATIDS	0	NA	NA	1	NA	NA	5
-VACUOLATION, SEMINIFEROUS EPITHELIUM	0	NA	NA	1	NA	NA	1
-GIANT CELL, MULTINUCLEATED	0	NA	NA	2	NA	NA	0
-DECREASED ELONGATED SPERMATIDS	0	NA	NA	1	NA	NA	0

1-METHYLCELLULOSE 2- 50 MG LINURON 3- 100 MG LINURON 4- 150 MG LINURON 5- 25 MG PHENO 6- 50 MG PHENO
7- 100 MG PHENO
NA = NOT APPLICABLE

FINAL REPORT

Volume 2 of 2
(Appendices I and J)

STUDY TITLE

INTER-LABORATORY[1] VALIDATION
OF THE 15-DAY ADULT INTACT MALE RAT
ASSAYWITH LINURON AND PHENOBARBITAL (WA 5-15)

STUDY NUMBER

WIL-431014

EPA CONTRACT NUMBER

68-W-01-023

STUDY DIRECTOR

Christopher J. Bowman, PhD, DABT

STUDY INITIATION DATE

3 October 2005

STUDY COMPLETION DATE

12 May 2006

PERFORMING LABORATORY

WIL Research Laboratories, LLC
1407 George Road
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SPONSOR

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Columbus, OH 43201-2693

[1] = The study described in this report was performed by a single laboratory, but will be used in support of an inter-laboratory validation of this bioassay.

APPENDIX I

Individual Animal Data

This appendix presents the data from "Inter-Laboratory Validation of the 15-Day Adult Intact Male Rat Assay With Linuron and Phenobarbital (WA 5-15)". Due to software spacing constraints, the study title is presented as "Inter-Lab 15-Day Male Rat Assay With Linuron & Phenobarbital" on the appendix tables, and some table titles have been shortened due to software spacing constraints.

TABLE RANGE: 10-24-05 TO 11-09-05

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
97126	M	METHYLCELLULOSE	DISPOSITION	11-07-05	7:24	P	SCHEDULED EUTHANASIA
97136	M	METHYLCELLULOSE	DISPOSITION	11-07-05	7:25	P	SCHEDULED EUTHANASIA
97157	M	METHYLCELLULOSE	DISPOSITION	11-07-05	7:25	P	SCHEDULED EUTHANASIA
97159	M	METHYLCELLULOSE	DISPOSITION	11-07-05	7:25	P	SCHEDULED EUTHANASIA
97168	M	METHYLCELLULOSE	DISPOSITION	11-07-05	7:25	P	SCHEDULED EUTHANASIA
97172	M	METHYLCELLULOSE	DISPOSITION	11-08-05	7:09	P	SCHEDULED EUTHANASIA
97192	M	METHYLCELLULOSE	DISPOSITION	11-08-05	7:10	P	SCHEDULED EUTHANASIA
97198	M	METHYLCELLULOSE	DISPOSITION	11-08-05	7:10	P	SCHEDULED EUTHANASIA
97200	M	METHYLCELLULOSE	DISPOSITION	11-08-05	7:10	P	SCHEDULED EUTHANASIA
97205	M	METHYLCELLULOSE	DISPOSITION	11-08-05	7:10	P	SCHEDULED EUTHANASIA
97212	M	METHYLCELLULOSE	DISPOSITION	11-09-05	7:14	P	SCHEDULED EUTHANASIA
97213	M	METHYLCELLULOSE	DISPOSITION	11-09-05	7:14	P	SCHEDULED EUTHANASIA
97226	M	METHYLCELLULOSE	DISPOSITION	11-09-05	7:14	P	SCHEDULED EUTHANASIA
97227	M	METHYLCELLULOSE	DISPOSITION	11-09-05	7:15	P	SCHEDULED EUTHANASIA
97237	M	METHYLCELLULOSE	DISPOSITION	11-09-05	7:15	P	SCHEDULED EUTHANASIA
97122	M	50 MG LINURON	DISPOSITION	11-07-05	7:25	P	SCHEDULED EUTHANASIA
97124	M	50 MG LINURON	DISPOSITION	11-07-05	7:25	P	SCHEDULED EUTHANASIA
97125	M	50 MG LINURON	DISPOSITION	11-07-05	7:25	P	SCHEDULED EUTHANASIA
97137	M	50 MG LINURON	DISPOSITION	11-07-05	7:25	P	SCHEDULED EUTHANASIA
97137	M	50 MG LINURON	EYES/EARS/NOSE	10-29-05	6:10	1	DRIED RED MATERIAL AROUND NOSE
				11-04-05	6:17	1	DRIED RED MATERIAL AROUND NOSE
97138	M	50 MG LINURON	DISPOSITION	11-07-05	7:25	P	SCHEDULED EUTHANASIA
97138	M	50 MG LINURON	BODY/INTEGUMENT	11-03-05	6:13	1	HAIR LOSS RIGHT FORELIMB
				11-03-05	6:13	1	HAIR LOSS LEFT FORELIMB
				11-05-05	6:14	1	HAIR LOSS RIGHT FORELIMB
				11-05-05	6:14	1	HAIR LOSS LEFT FORELIMB
				11-06-05	6:16	1	HAIR LOSS RIGHT FORELIMB
				11-06-05	6:16	1	HAIR LOSS LEFT FORELIMB
97165	M	50 MG LINURON	DISPOSITION	11-08-05	7:10	P	SCHEDULED EUTHANASIA

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

TABLE RANGE: 10-24-05 TO 11-09-05

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
97176	M	50 MG LINURON	DISPOSITION	11-08-05	7:10	P	SCHEDULED EUTHANASIA
97189	M	50 MG LINURON	DISPOSITION	11-08-05	7:10	P	SCHEDULED EUTHANASIA
97197	M	50 MG LINURON	DISPOSITION	11-08-05	7:10	P	SCHEDULED EUTHANASIA
97197	M	50 MG LINURON	BODY/INTEGUMENT	10-26-05	6:25	1	HAIR LOSS RIGHT FORELIMB
				10-27-05	6:58	1	HAIR LOSS RIGHT FORELIMB
				10-27-05	6:58	1	HAIR LOSS LEFT FORELIMB
				10-28-05	6:47	1	HAIR LOSS RIGHT FORELIMB
				10-28-05	6:47	1	HAIR LOSS LEFT FORELIMB
				10-29-05	6:12	1	HAIR LOSS RIGHT FORELIMB
				10-29-05	6:12	1	HAIR LOSS LEFT FORELIMB
				10-30-05	6:11	1	HAIR LOSS RIGHT FORELIMB
				10-30-05	6:11	1	HAIR LOSS LEFT FORELIMB
				10-31-05	6:24	1	HAIR LOSS RIGHT FORELIMB
				10-31-05	6:24	1	HAIR LOSS LEFT FORELIMB
				11-01-05	6:26	1	HAIR LOSS RIGHT FORELIMB
				11-01-05	6:26	1	HAIR LOSS LEFT FORELIMB
				11-02-05	6:49	1	HAIR LOSS RIGHT FORELIMB
				11-02-05	6:49	1	HAIR LOSS LEFT FORELIMB
				11-03-05	6:14	1	HAIR LOSS RIGHT FORELIMB
				11-03-05	6:14	1	HAIR LOSS LEFT FORELIMB
				11-04-05	6:19	1	HAIR LOSS RIGHT FORELIMB
				11-04-05	6:19	1	HAIR LOSS LEFT FORELIMB
				11-05-05	6:16	1	HAIR LOSS RIGHT FORELIMB
				11-05-05	6:16	1	HAIR LOSS LEFT FORELIMB
				11-06-05	6:18	1	HAIR LOSS RIGHT FORELIMB
				11-06-05	6:18	1	HAIR LOSS LEFT FORELIMB
				11-07-05	7:40	1	HAIR LOSS RIGHT FORELIMB
				11-07-05	7:40	1	HAIR LOSS LEFT FORELIMB
				11-08-05	6:35	1	HAIR LOSS RIGHT FORELIMB

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

TABLE RANGE: 10-24-05 TO 11-09-05

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
97197	M	50 MG LINURON	BODY/INTEGUMENT	11-08-05	6:35	1	HAIR LOSS LEFT FORELIMB
97199	M	50 MG LINURON	DISPOSITION	11-08-05	7:11	P	SCHEDULED EUTHANASIA
97206	M	50 MG LINURON	DISPOSITION	11-09-05	7:15	P	SCHEDULED EUTHANASIA
97210	M	50 MG LINURON	DISPOSITION	11-09-05	7:15	P	SCHEDULED EUTHANASIA
97217	M	50 MG LINURON	DISPOSITION	11-09-05	7:15	P	SCHEDULED EUTHANASIA
97217	M	50 MG LINURON	BODY/INTEGUMENT	10-31-05	6:25	1	HAIR LOSS VENTRAL ABDOMINAL AREA
				11-01-05	6:28	1	HAIR LOSS VENTRAL ABDOMINAL AREA
				11-03-05	6:16	1	HAIR LOSS VENTRAL ABDOMINAL AREA
				11-04-05	6:21	1	HAIR LOSS VENTRAL ABDOMINAL AREA
97217	M	50 MG LINURON	EYES/EARS/NOSE	10-29-05	6:13	1	DRIED RED MATERIAL AROUND NOSE
				10-30-05	6:13	1	DRIED RED MATERIAL AROUND NOSE
				11-01-05	6:28	1	DRIED RED MATERIAL AROUND NOSE
97221	M	50 MG LINURON	DISPOSITION	11-09-05	7:15	P	SCHEDULED EUTHANASIA
97221	M	50 MG LINURON	EYES/EARS/NOSE	10-29-05	6:14	1	DRIED RED MATERIAL AROUND NOSE
97236	M	50 MG LINURON	DISPOSITION	11-09-05	7:15	P	SCHEDULED EUTHANASIA
97119	M	100 MG LINURON	DISPOSITION	11-07-05	7:26	P	SCHEDULED EUTHANASIA
97132	M	100 MG LINURON	DISPOSITION	11-07-05	7:26	P	SCHEDULED EUTHANASIA
97132	M	100 MG LINURON	BODY/INTEGUMENT	10-28-05	6:51	1	HAIR LOSS VENTRAL ABDOMINAL AREA
				10-29-05	6:16	2	HAIR LOSS VENTRAL ABDOMINAL AREA
				10-30-05	6:15	2	HAIR LOSS VENTRAL ABDOMINAL AREA
				10-31-05	6:27	2	HAIR LOSS VENTRAL ABDOMINAL AREA
				11-01-05	6:30	3	HAIR LOSS VENTRAL ABDOMINAL AREA
				11-01-05	6:30	1	HAIR LOSS RIGHT HINDLIMB
				11-01-05	6:30	1	HAIR LOSS LEFT HINDLIMB
				11-02-05	7:02	2	HAIR LOSS VENTRAL ABDOMINAL AREA
				11-03-05	6:17	3	HAIR LOSS VENTRAL ABDOMINAL AREA
				11-03-05	6:18	2	HAIR LOSS VENTRAL THORACIC AREA
				11-03-05	6:18	1	HAIR LOSS UROGENITAL AREA
				11-04-05	6:23	2	HAIR LOSS VENTRAL ABDOMINAL AREA

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

TABLE RANGE: 10-24-05 TO 11-09-05

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
97132	M	100 MG LINURON	BODY/INTEGUMENT	11-04-05	6:23	2	HAIR LOSS VENTRAL THORACIC AREA
				11-05-05	6:18	2	HAIR LOSS VENTRAL ABDOMINAL AREA
				11-05-05	6:18	2	HAIR LOSS VENTRAL THORACIC AREA
				11-06-05	6:20	2	HAIR LOSS VENTRAL THORACIC AREA
				11-06-05	6:20	2	HAIR LOSS VENTRAL ABDOMINAL AREA
				11-07-05	6:36	2	HAIR LOSS VENTRAL ABDOMINAL AREA
				11-07-05	6:36	2	HAIR LOSS VENTRAL THORACIC AREA
97132	M	100 MG LINURON	EXCRETA	11-03-05	6:18	P	DECREASED DEFECATION
				11-04-05	6:23	P	DECREASED DEFECATION
97148	M	100 MG LINURON	DISPOSITION	11-07-05	7:26	P	SCHEDULED EUTHANASIA
97148	M	100 MG LINURON	BODY/INTEGUMENT	10-28-05	6:52	1	HAIR LOSS RIGHT FORELIMB
				10-28-05	6:52	1	HAIR LOSS LEFT FORELIMB
				10-29-05	6:17	1	HAIR LOSS RIGHT FORELIMB
				10-29-05	6:17	1	HAIR LOSS LEFT FORELIMB
				10-30-05	6:15	1	HAIR LOSS RIGHT FORELIMB
				10-30-05	6:15	1	HAIR LOSS LEFT FORELIMB
				10-31-05	6:28	1	HAIR LOSS RIGHT FORELIMB
				10-31-05	6:28	1	HAIR LOSS LEFT FORELIMB
				11-01-05	6:31	1	HAIR LOSS RIGHT FORELIMB
				11-01-05	6:31	1	HAIR LOSS LEFT FORELIMB
				11-02-05	7:02	1	HAIR LOSS RIGHT FORELIMB
				11-02-05	7:02	1	HAIR LOSS LEFT FORELIMB
				11-03-05	6:18	1	HAIR LOSS RIGHT FORELIMB
				11-03-05	6:18	1	HAIR LOSS LEFT FORELIMB
				11-06-05	6:21	1	HAIR LOSS RIGHT FORELIMB
				11-06-05	6:21	1	HAIR LOSS LEFT FORELIMB
				11-07-05	6:38	1	HAIR LOSS RIGHT FORELIMB
				11-07-05	6:38	1	HAIR LOSS LEFT FORELIMB
97150	M	100 MG LINURON	DISPOSITION	11-07-05	7:26	P	SCHEDULED EUTHANASIA

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

TABLE RANGE: 10-24-05 TO 11-09-05

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
97152	M	100 MG LINURON	DISPOSITION	11-07-05	7:26	P	SCHEDULED EUTHANASIA
97152	M	100 MG LINURON	BODY/INTEGUMENT	10-29-05	6:18	2	HAIR LOSS VENTRAL ABDOMINAL AREA
				10-29-05	6:18	1	HAIR LOSS RIGHT HINDLIMB
				10-29-05	6:18	2	HAIR LOSS LEFT HINDLIMB
				10-30-05	6:17	2	HAIR LOSS VENTRAL ABDOMINAL AREA
				10-30-05	6:17	1	HAIR LOSS RIGHT HINDLIMB
				10-30-05	6:17	2	HAIR LOSS LEFT HINDLIMB
				10-31-05	6:29	2	HAIR LOSS VENTRAL ABDOMINAL AREA
				10-31-05	6:29	1	HAIR LOSS RIGHT HINDLIMB
				10-31-05	6:30	1	HAIR LOSS LEFT HINDLIMB
				11-01-05	6:31	3	HAIR LOSS VENTRAL ABDOMINAL AREA
				11-01-05	6:31	2	HAIR LOSS LEFT HINDLIMB
				11-01-05	6:31	2	HAIR LOSS RIGHT HINDLIMB
				11-02-05	7:03	2	HAIR LOSS VENTRAL ABDOMINAL AREA
				11-02-05	7:03	2	HAIR LOSS RIGHT HINDLIMB
				11-02-05	7:03	2	HAIR LOSS LEFT HINDLIMB
				11-03-05	6:19	3	HAIR LOSS VENTRAL ABDOMINAL AREA
				11-03-05	6:19	3	HAIR LOSS VENTRAL THORACIC AREA
				11-03-05	6:19	2	HAIR LOSS RIGHT HINDLIMB
				11-03-05	6:19	2	HAIR LOSS LEFT HINDLIMB
				11-03-05	6:19	2	HAIR LOSS UROGENITAL AREA
				11-04-05	6:24	3	HAIR LOSS VENTRAL ABDOMINAL AREA
				11-04-05	6:24	2	HAIR LOSS VENTRAL THORACIC AREA
				11-04-05	6:24	2	HAIR LOSS LEFT HINDLIMB
				11-04-05	6:24	2	HAIR LOSS RIGHT HINDLIMB
				11-05-05	6:19	3	HAIR LOSS VENTRAL ABDOMINAL AREA
				11-05-05	6:19	2	HAIR LOSS VENTRAL THORACIC AREA
				11-05-05	6:19	2	HAIR LOSS UROGENITAL AREA
				11-05-05	6:19	2	HAIR LOSS RIGHT HINDLIMB

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

TABLE RANGE: 10-24-05 TO 11-09-05

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
97152	M	100 MG LINURON	BODY/INTEGUMENT	11-05-05	6:19	2	HAIR LOSS LEFT HINDLIMB
				11-06-05	6:22	3	HAIR LOSS VENTRAL ABDOMINAL AREA
				11-06-05	6:22	2	HAIR LOSS VENTRAL THORACIC AREA
				11-06-05	6:22	2	HAIR LOSS RIGHT HINDLIMB
				11-06-05	6:22	2	HAIR LOSS LEFT HINDLIMB
				11-06-05	6:22	1	HAIR LOSS UROGENITAL AREA
				11-07-05	6:42	3	HAIR LOSS VENTRAL ABDOMINAL AREA
				11-07-05	6:42	2	HAIR LOSS VENTRAL THORACIC AREA
				11-07-05	6:42	2	HAIR LOSS RIGHT HINDLIMB
				11-07-05	6:42	2	HAIR LOSS LEFT HINDLIMB
				11-07-05	6:42	1	HAIR LOSS UROGENITAL AREA
97163	M	100 MG LINURON	DISPOSITION	11-08-05	7:11	P	SCHEDULED EUTHANASIA
97163	M	100 MG LINURON	EXCRETA	11-01-05	6:32	P	DECREASED DEFECATION
97166	M	100 MG LINURON	DISPOSITION	11-08-05	7:11	P	SCHEDULED EUTHANASIA
97166	M	100 MG LINURON	EXCRETA	10-29-05	6:20	P	SOFT STOOL
97167	M	100 MG LINURON	DISPOSITION	11-08-05	7:11	P	SCHEDULED EUTHANASIA
97170	M	100 MG LINURON	DISPOSITION	11-08-05	7:11	P	SCHEDULED EUTHANASIA
97170	M	100 MG LINURON	BODY/INTEGUMENT	10-28-05	6:54	1	HAIR LOSS VENTRAL ABDOMINAL AREA
				10-29-05	6:20	1	HAIR LOSS VENTRAL ABDOMINAL AREA
				10-30-05	6:18	1	HAIR LOSS VENTRAL ABDOMINAL AREA
				10-31-05	6:32	1	HAIR LOSS VENTRAL ABDOMINAL AREA
				11-01-05	6:34	1	HAIR LOSS VENTRAL ABDOMINAL AREA
				11-02-05	7:05	1	HAIR LOSS VENTRAL ABDOMINAL AREA
				11-03-05	6:21	2	HAIR LOSS VENTRAL ABDOMINAL AREA
				11-03-05	6:21	2	HAIR LOSS VENTRAL THORACIC AREA
				11-03-05	6:21	1	HAIR LOSS RUMP
				11-04-05	6:26	2	HAIR LOSS VENTRAL ABDOMINAL AREA
				11-04-05	6:26	2	HAIR LOSS VENTRAL THORACIC AREA
				11-05-05	6:21	2	HAIR LOSS VENTRAL ABDOMINAL AREA

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

TABLE RANGE: 10-24-05 TO 11-09-05

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
97170	M	100 MG LINURON	BODY/INTEGUMENT	11-05-05	6:21	2	HAIR LOSS VENTRAL THORACIC AREA
				11-07-05	7:43	2	HAIR LOSS VENTRAL ABDOMINAL AREA
				11-07-05	7:43	1	HAIR LOSS VENTRAL THORACIC AREA
				11-08-05	6:36	1	HAIR LOSS VENTRAL ABDOMINAL AREA
				11-08-05	6:36	1	HAIR LOSS VENTRAL THORACIC AREA
97181	M	100 MG LINURON	DISPOSITION	11-08-05	7:11	P	SCHEDULED EUTHANASIA
97181	M	100 MG LINURON	BODY/INTEGUMENT	10-28-05	6:56	1	HAIR LOSS RUMP
				10-28-05	6:56	2	HAIR LOSS RIGHT HINDLIMB
				10-28-05	6:56	1	HAIR LOSS LEFT HINDLIMB
				10-29-05	6:21	2	HAIR LOSS RIGHT HINDLIMB
				10-29-05	6:21	1	HAIR LOSS LEFT HINDLIMB
				10-29-05	6:22	1	HAIR LOSS UROGENITAL AREA
				10-30-05	6:19	1	HAIR LOSS RIGHT HINDLIMB
				10-30-05	6:19	1	HAIR LOSS LEFT HINDLIMB
				10-30-05	6:19	1	HAIR LOSS UROGENITAL AREA
				10-31-05	6:33	1	HAIR LOSS RIGHT HINDLIMB
				10-31-05	6:33	1	HAIR LOSS LEFT HINDLIMB
				11-07-05	7:43	1	HAIR LOSS RIGHT HINDLIMB
				11-07-05	7:43	1	HAIR LOSS LEFT HINDLIMB
97184	M	100 MG LINURON	DISPOSITION	11-09-05	7:15	P	SCHEDULED EUTHANASIA
97185	M	100 MG LINURON	DISPOSITION	11-09-05	7:16	P	SCHEDULED EUTHANASIA
97188	M	100 MG LINURON	DISPOSITION	11-09-05	7:16	P	SCHEDULED EUTHANASIA
97188	M	100 MG LINURON	BODY/INTEGUMENT	10-28-05	6:58	1	HAIR LOSS VENTRAL ABDOMINAL AREA
				10-29-05	6:23	1	HAIR LOSS VENTRAL ABDOMINAL AREA
				10-29-05	6:23	1	HAIR LOSS LEFT HINDLIMB
				10-29-05	6:23	1	HAIR LOSS RIGHT HINDLIMB
				10-30-05	6:20	1	HAIR LOSS VENTRAL ABDOMINAL AREA
				10-30-05	6:20	1	HAIR LOSS RIGHT HINDLIMB
				10-30-05	6:20	1	HAIR LOSS LEFT HINDLIMB

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

TABLE RANGE: 10-24-05 TO 11-09-05

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
97188	M	100 MG LINURON	BODY/INTEGUMENT	10-31-05	6:34	1	HAIR LOSS RIGHT HINDLIMB
				10-31-05	6:34	1	HAIR LOSS LEFT HINDLIMB
				10-31-05	6:34	2	HAIR LOSS VENTRAL ABDOMINAL AREA
				11-01-05	6:36	1	HAIR LOSS RIGHT HINDLIMB
				11-01-05	6:36	1	HAIR LOSS LEFT HINDLIMB
				11-01-05	6:36	1	HAIR LOSS VENTRAL ABDOMINAL AREA
				11-02-05	7:08	1	HAIR LOSS RIGHT HINDLIMB
				11-02-05	7:08	1	HAIR LOSS LEFT HINDLIMB
				11-02-05	7:08	1	HAIR LOSS VENTRAL ABDOMINAL AREA
				11-02-05	7:08	1	HAIR LOSS RIGHT LATERAL ABDOMINAL AREA
				11-03-05	6:23	2	HAIR LOSS VENTRAL ABDOMINAL AREA
				11-03-05	6:23	2	HAIR LOSS RIGHT HINDLIMB
				11-03-05	6:23	2	HAIR LOSS LEFT HINDLIMB
				11-04-05	6:28	2	HAIR LOSS VENTRAL ABDOMINAL AREA
				11-04-05	6:28	2	HAIR LOSS RIGHT HINDLIMB
				11-04-05	6:28	2	HAIR LOSS LEFT HINDLIMB
				11-04-05	6:28	2	HAIR LOSS VENTRAL THORACIC AREA
				11-04-05	6:28	2	HAIR LOSS RIGHT LATERAL ABDOMINAL AREA
				11-05-05	6:22	2	HAIR LOSS VENTRAL ABDOMINAL AREA
				11-05-05	6:22	1	HAIR LOSS RIGHT HINDLIMB
				11-05-05	6:22	1	HAIR LOSS LEFT HINDLIMB
				11-05-05	6:22	1	HAIR LOSS UROGENITAL AREA
				11-06-05	6:25	2	HAIR LOSS VENTRAL ABDOMINAL AREA
				11-06-05	6:25	2	HAIR LOSS RIGHT HINDLIMB
				11-06-05	6:25	2	HAIR LOSS LEFT HINDLIMB
				11-07-05	7:44	2	HAIR LOSS VENTRAL ABDOMINAL AREA
				11-07-05	7:44	2	HAIR LOSS RIGHT HINDLIMB
				11-07-05	7:44	2	HAIR LOSS LEFT HINDLIMB
				11-07-05	7:44	1	HAIR LOSS UROGENITAL AREA

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

TABLE RANGE: 10-24-05 TO 11-09-05

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
97188	M	100 MG LINURON	BODY/INTEGUMENT	11-08-05	7:20	3	HAIR LOSS VENTRAL ABDOMINAL AREA
				11-08-05	7:20	2	HAIR LOSS RIGHT HINDLIMB
				11-08-05	7:20	2	HAIR LOSS LEFT HINDLIMB
				11-08-05	7:20	1	WET YELLOW MATERIAL UROGENITAL AREA
				11-09-05	6:36	2	HAIR LOSS VENTRAL ABDOMINAL AREA
				11-09-05	6:36	2	HAIR LOSS RIGHT HINDLIMB
				11-09-05	6:36	2	HAIR LOSS LEFT HINDLIMB
				11-09-05	6:36	1	HAIR LOSS UROGENITAL AREA
97193	M	100 MG LINURON	DISPOSITION	11-09-05	7:16	P	SCHEDULED EUTHANASIA
97238	M	100 MG LINURON	DISPOSITION	11-09-05	7:16	P	SCHEDULED EUTHANASIA
97128	M	150 MG LINURON	DISPOSITION	11-07-05	7:26	P	SCHEDULED EUTHANASIA
97128	M	150 MG LINURON	EXCRETA	10-25-05	6:23	P	DECREASED DEFECATION
				10-27-05	7:09	P	DECREASED DEFECATION
97140	M	150 MG LINURON	DISPOSITION	11-07-05	7:26	P	SCHEDULED EUTHANASIA
97140	M	150 MG LINURON	EYES/EARS/NOSE	11-02-05	7:11	1	DRIED RED MATERIAL AROUND NOSE
97142	M	150 MG LINURON	DISPOSITION	11-07-05	7:26	P	SCHEDULED EUTHANASIA
97142	M	150 MG LINURON	ORAL/DENTAL	11-06-05	6:27	1	WET CLEAR MATERIAL AROUND MOUTH
97144	M	150 MG LINURON	DISPOSITION	11-07-05	7:27	P	SCHEDULED EUTHANASIA
97144	M	150 MG LINURON	BODY/INTEGUMENT	11-02-05	7:12	2	HAIR LOSS LEFT HINDLIMB
				11-02-05	7:12	1	HAIR LOSS VENTRAL ABDOMINAL AREA
				11-03-05	6:25	2	HAIR LOSS VENTRAL ABDOMINAL AREA
				11-03-05	6:25	3	HAIR LOSS LEFT HINDLIMB
				11-03-05	6:25	2	HAIR LOSS RIGHT HINDLIMB
				11-04-05	6:30	2	HAIR LOSS VENTRAL ABDOMINAL AREA
				11-04-05	6:30	2	HAIR LOSS RIGHT HINDLIMB
				11-04-05	6:30	2	HAIR LOSS LEFT HINDLIMB
				11-05-05	6:24	2	HAIR LOSS VENTRAL ABDOMINAL AREA
				11-05-05	6:24	2	HAIR LOSS RIGHT HINDLIMB
				11-05-05	6:24	2	HAIR LOSS LEFT HINDLIMB

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

TABLE RANGE: 10-24-05 TO 11-09-05

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
97144	M	150 MG LINURON	BODY/INTEGUMENT	11-05-05	6:24	2	HAIR LOSS UROGENITAL AREA
				11-05-05	6:24	1	HAIR LOSS ANOGENITAL AREA
				11-05-05	6:25	1	HAIR LOSS BASE OF TAIL
				11-06-05	6:28	2	HAIR LOSS VENTRAL ABDOMINAL AREA
				11-06-05	6:28	2	HAIR LOSS RIGHT HINDLIMB
				11-06-05	6:28	2	HAIR LOSS LEFT HINDLIMB
				11-07-05	6:40	2	HAIR LOSS VENTRAL ABDOMINAL AREA
				11-07-05	6:40	2	HAIR LOSS RIGHT HINDLIMB
				11-07-05	6:40	2	HAIR LOSS LEFT HINDLIMB
97144	M	150 MG LINURON	EXCRETA	11-01-05	6:39	P	DECREASED DEFECATION
97161	M	150 MG LINURON	DISPOSITION	11-07-05	7:27	P	SCHEDULED EUTHANASIA
97161	M	150 MG LINURON	BODY/INTEGUMENT	10-26-05	6:39	P	UNKEMPT APPEARANCE
				10-27-05	7:12	P	UNKEMPT APPEARANCE
				10-29-05	6:26	1	HAIR LOSS RIGHT HINDLIMB
				10-30-05	6:22	1	HAIR LOSS VENTRAL ABDOMINAL AREA
				10-30-05	6:22	1	HAIR LOSS RIGHT HINDLIMB
				10-31-05	6:39	1	HAIR LOSS RIGHT HINDLIMB
				10-31-05	6:39	1	HAIR LOSS VENTRAL ABDOMINAL AREA
				11-01-05	6:39	1	HAIR LOSS VENTRAL ABDOMINAL AREA
				11-01-05	6:39	1	HAIR LOSS RIGHT HINDLIMB
				11-02-05	7:13	2	HAIR LOSS VENTRAL ABDOMINAL AREA
				11-03-05	6:26	2	HAIR LOSS VENTRAL ABDOMINAL AREA
				11-03-05	6:26	1	HAIR LOSS RIGHT HINDLIMB
				11-03-05	6:26	1	HAIR LOSS LEFT HINDLIMB
				11-04-05	6:31	2	HAIR LOSS VENTRAL ABDOMINAL AREA
				11-04-05	6:31	2	HAIR LOSS RIGHT HINDLIMB
				11-04-05	6:31	2	HAIR LOSS LEFT HINDLIMB
				11-05-05	6:25	2	HAIR LOSS VENTRAL ABDOMINAL AREA
				11-05-05	6:25	1	HAIR LOSS RIGHT HINDLIMB

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

TABLE RANGE: 10-24-05 TO 11-09-05

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
97161	M	150 MG LINURON	BODY/INTEGUMENT	11-05-05	6:25	1	HAIR LOSS LEFT HINDLIMB
				11-06-05	6:28	2	HAIR LOSS VENTRAL ABDOMINAL AREA
				11-06-05	6:28	1	HAIR LOSS RIGHT HINDLIMB
				11-06-05	6:28	1	HAIR LOSS LEFT HINDLIMB
				11-07-05	6:42	2	HAIR LOSS VENTRAL ABDOMINAL AREA
				11-07-05	6:42	2	HAIR LOSS RIGHT HINDLIMB
				11-07-05	6:42	2	HAIR LOSS LEFT HINDLIMB
97161	M	150 MG LINURON	EYES/EARS/NOSE	10-26-05	6:39	2	DRIED RED MATERIAL AROUND LEFT EYE
				10-26-05	6:39	2	DRIED RED MATERIAL AROUND RIGHT EYE
				10-27-05	7:11	2	DRIED RED MATERIAL AROUND LEFT EYE
				10-27-05	7:11	2	DRIED RED MATERIAL AROUND RIGHT EYE
				10-28-05	7:01	1	DRIED RED MATERIAL AROUND NOSE
				10-28-05	7:01	1	DRIED RED MATERIAL AROUND LEFT EYE
				10-28-05	7:01	1	DRIED RED MATERIAL AROUND RIGHT EYE
				10-29-05	6:26	1	DRIED RED MATERIAL AROUND RIGHT EYE
				10-30-05	6:22	1	DRIED RED MATERIAL AROUND RIGHT EYE
				10-31-05	6:40	1	DRIED RED MATERIAL AROUND RIGHT EYE
97161	M	150 MG LINURON	EXCRETA	10-28-05	7:01	P	DECREASED DEFECATION
97161	M	150 MG LINURON	ORAL/DENTAL	10-27-05	7:12	1	DRIED RED MATERIAL AROUND MOUTH
97162	M	150 MG LINURON	DISPOSITION	11-08-05	7:12	P	SCHEDULED EUTHANASIA
97162	M	150 MG LINURON	BODY/INTEGUMENT	10-27-05	7:13	P	UNKEMPT APPEARANCE
				11-03-05	6:27	P	UNKEMPT APPEARANCE
				11-04-05	6:32	P	UNKEMPT APPEARANCE
				11-05-05	6:26	1	DRIED YELLOW MATERIAL UROGENITAL AREA
97162	M	150 MG LINURON	EYES/EARS/NOSE	10-25-05	6:26	2	DRIED RED MATERIAL AROUND NOSE
				10-25-05	6:26	2	DRIED RED MATERIAL AROUND RIGHT EYE
				10-26-05	6:40	1	DRIED RED MATERIAL AROUND RIGHT EYE
				10-26-05	6:40	1	DRIED RED MATERIAL AROUND NOSE
				10-27-05	7:13	1	DRIED RED MATERIAL AROUND LEFT EYE

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

TABLE RANGE: 10-24-05 TO 11-09-05

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
97162	M	150 MG LINURON	EYES/EARS/NOSE	10-27-05	7:13	2	DRIED RED MATERIAL AROUND RIGHT EYE
				10-27-05	7:13	1	DRIED RED MATERIAL AROUND NOSE
				10-28-05	7:02	1	DRIED RED MATERIAL AROUND NOSE
				10-28-05	7:02	2	DRIED RED MATERIAL AROUND RIGHT EYE
				10-28-05	7:02	1	DRIED RED MATERIAL AROUND LEFT EYE
				10-29-05	6:27	1	DRIED RED MATERIAL AROUND RIGHT EYE
				10-29-05	6:27	1	DRIED RED MATERIAL AROUND NOSE
				10-29-05	6:27	2	WET RED MATERIAL AROUND RIGHT EYE
				10-30-05	6:23	1	DRIED RED MATERIAL AROUND NOSE
				10-30-05	6:23	1	DRIED RED MATERIAL AROUND LEFT EYE
				10-30-05	6:23	2	DRIED RED MATERIAL AROUND RIGHT EYE
				10-30-05	6:24	1	LACRIMATION RIGHT EYE
				10-31-05	6:40	1	DRIED RED MATERIAL AROUND NOSE
				10-31-05	6:40	1	DRIED RED MATERIAL AROUND LEFT EYE
				10-31-05	6:40	1	DRIED RED MATERIAL AROUND RIGHT EYE
				11-01-05	6:40	1	DRIED RED MATERIAL AROUND NOSE
				11-01-05	6:40	1	DRIED RED MATERIAL AROUND RIGHT EYE
				11-02-05	7:13	1	DRIED RED MATERIAL AROUND RIGHT EYE
				11-02-05	7:13	1	DRIED RED MATERIAL AROUND NOSE
				11-03-05	6:27	1	DRIED RED MATERIAL AROUND NOSE
				11-03-05	6:27	2	DRIED RED MATERIAL AROUND RIGHT EYE
				11-04-05	6:32	2	DRIED RED MATERIAL AROUND NOSE
				11-04-05	6:32	2	DRIED RED MATERIAL AROUND RIGHT EYE
				11-05-05	6:26	2	DRIED RED MATERIAL AROUND NOSE
				11-05-05	6:26	2	DRIED RED MATERIAL AROUND RIGHT EYE
				11-06-05	6:29	1	DRIED RED MATERIAL AROUND NOSE
				11-06-05	6:29	2	DRIED RED MATERIAL AROUND RIGHT EYE
				11-07-05	7:45	1	DRIED RED MATERIAL AROUND NOSE
				11-07-05	7:45	2	DRIED RED MATERIAL AROUND RIGHT EYE

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

TABLE RANGE: 10-24-05 TO 11-09-05

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
97162	M	150 MG LINURON	EYES/EARS/NOSE	11-08-05	6:30	2	DRIED RED MATERIAL AROUND RIGHT EYE
97162	M	150 MG LINURON	ORAL/DENTAL	10-27-05	7:14	1	DRIED RED MATERIAL AROUND MOUTH
				10-28-05	7:02	1	DRIED RED MATERIAL AROUND MOUTH
97171	M	150 MG LINURON	DISPOSITION	11-08-05	7:12	P	SCHEDULED EUTHANASIA
97171	M	150 MG LINURON	BODY/INTEGUMENT	10-27-05	7:15	1	HAIR LOSS VENTRAL ABDOMINAL AREA
				10-28-05	7:03	2	HAIR LOSS VENTRAL ABDOMINAL AREA
				10-29-05	6:28	2	HAIR LOSS VENTRAL ABDOMINAL AREA
				10-29-05	6:28	1	HAIR LOSS RIGHT HINDLIMB
				10-29-05	6:28	1	HAIR LOSS LEFT HINDLIMB
				10-29-05	6:28	2	HAIR LOSS VENTRAL THORACIC AREA
				10-30-05	6:24	2	HAIR LOSS VENTRAL ABDOMINAL AREA
				10-30-05	6:24	1	HAIR LOSS RIGHT HINDLIMB
				10-30-05	6:24	1	HAIR LOSS LEFT HINDLIMB
				10-30-05	6:25	2	HAIR LOSS VENTRAL THORACIC AREA
				10-31-05	6:41	2	HAIR LOSS RIGHT HINDLIMB
				10-31-05	6:41	2	HAIR LOSS LEFT HINDLIMB
				10-31-05	6:41	2	HAIR LOSS VENTRAL ABDOMINAL AREA
				10-31-05	6:41	2	HAIR LOSS VENTRAL THORACIC AREA
				11-01-05	6:41	2	HAIR LOSS VENTRAL ABDOMINAL AREA
				11-01-05	6:41	2	HAIR LOSS LEFT HINDLIMB
				11-01-05	6:41	2	HAIR LOSS RIGHT HINDLIMB
				11-01-05	6:41	2	HAIR LOSS VENTRAL THORACIC AREA
				11-02-05	7:14	2	HAIR LOSS RIGHT HINDLIMB
				11-02-05	7:14	2	HAIR LOSS LEFT HINDLIMB
				11-02-05	7:14	2	HAIR LOSS VENTRAL ABDOMINAL AREA
				11-03-05	6:27	2	HAIR LOSS VENTRAL ABDOMINAL AREA
				11-03-05	6:27	2	HAIR LOSS RIGHT HINDLIMB
				11-03-05	6:27	2	HAIR LOSS LEFT HINDLIMB
				11-03-05	6:27	2	HAIR LOSS VENTRAL THORACIC AREA

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

TABLE RANGE: 10-24-05 TO 11-09-05

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
97171	M	150 MG LINURON	BODY/INTEGUMENT	11-03-05	6:27	2	HAIR LOSS UROGENITAL AREA
				11-03-05	6:28	1	HAIR LOSS RIGHT LATERAL ABDOMINAL AREA
				11-04-05	6:33	2	HAIR LOSS VENTRAL ABDOMINAL AREA
				11-04-05	6:33	1	HAIR LOSS RUMP
				11-04-05	6:33	2	HAIR LOSS RIGHT HINDLIMB
				11-04-05	6:33	2	HAIR LOSS LEFT HINDLIMB
				11-04-05	6:33	1	HAIR LOSS ANOGENITAL AREA
				11-04-05	6:33	1	HAIR LOSS BASE OF TAIL
				11-04-05	6:33	2	HAIR LOSS VENTRAL THORACIC AREA
				11-05-05	6:26	3	HAIR LOSS VENTRAL ABDOMINAL AREA
				11-05-05	6:26	2	HAIR LOSS VENTRAL THORACIC AREA
				11-05-05	6:26	2	HAIR LOSS RIGHT HINDLIMB
				11-05-05	6:26	2	HAIR LOSS LEFT HINDLIMB
				11-05-05	6:26	1	HAIR LOSS UROGENITAL AREA
				11-05-05	6:26	1	HAIR LOSS ANOGENITAL AREA
				11-05-05	6:27	1	HAIR LOSS BASE OF TAIL
				11-06-05	6:29	2	HAIR LOSS VENTRAL ABDOMINAL AREA
				11-06-05	6:30	2	HAIR LOSS VENTRAL THORACIC AREA
				11-06-05	6:30	2	HAIR LOSS RIGHT HINDLIMB
				11-06-05	6:30	2	HAIR LOSS LEFT HINDLIMB
				11-06-05	6:30	1	HAIR LOSS BASE OF TAIL
				11-06-05	6:30	1	HAIR LOSS UROGENITAL AREA
				11-07-05	7:46	3	HAIR LOSS VENTRAL ABDOMINAL AREA
				11-07-05	7:46	2	HAIR LOSS VENTRAL THORACIC AREA
				11-07-05	7:46	2	HAIR LOSS RIGHT HINDLIMB
				11-07-05	7:46	2	HAIR LOSS LEFT HINDLIMB
				11-07-05	7:46	1	HAIR LOSS BASE OF TAIL
				11-08-05	6:32	2	HAIR LOSS VENTRAL ABDOMINAL AREA
				11-08-05	6:32	2	HAIR LOSS VENTRAL THORACIC AREA

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

TABLE RANGE: 10-24-05 TO 11-09-05

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
97171	M	150 MG LINURON	BODY/INTEGUMENT	11-08-05	6:32	2	HAIR LOSS RIGHT HINDLIMB
				11-08-05	6:32	2	HAIR LOSS LEFT HINDLIMB
				11-08-05	6:32	1	HAIR LOSS ANOGENITAL AREA
				11-08-05	6:32	1	HAIR LOSS RUMP
				11-08-05	6:32	1	HAIR LOSS UROGENITAL AREA
				11-08-05	6:32	1	HAIR LOSS BASE OF TAIL
97174	M	150 MG LINURON	DISPOSITION	11-08-05	7:13	P	SCHEDULED EUTHANASIA
97207	M	150 MG LINURON	DISPOSITION	11-08-05	7:13	P	SCHEDULED EUTHANASIA
97207	M	150 MG LINURON	EYES/EARS/NOSE	10-28-05	7:04	1	DRIED RED MATERIAL AROUND LEFT EYE
				10-28-05	7:04	1	DRIED RED MATERIAL AROUND RIGHT EYE
				10-29-05	6:29	1	DRIED RED MATERIAL AROUND RIGHT EYE
97211	M	150 MG LINURON	DISPOSITION	11-08-05	7:13	P	SCHEDULED EUTHANASIA
97214	M	150 MG LINURON	DISPOSITION	11-09-05	7:16	P	SCHEDULED EUTHANASIA
97214	M	150 MG LINURON	EYES/EARS/NOSE	10-29-05	6:30	1	DRIED RED MATERIAL AROUND NOSE
				11-01-05	6:43	1	DRIED RED MATERIAL AROUND NOSE
				11-06-05	6:31	1	DRIED RED MATERIAL AROUND NOSE
97214	M	150 MG LINURON	EXCRETA	11-01-05	6:44	P	DECREASED DEFECATION
97222	M	150 MG LINURON	DISPOSITION	11-09-05	7:16	P	SCHEDULED EUTHANASIA
97222	M	150 MG LINURON	BODY/INTEGUMENT	10-29-05	6:30	1	HAIR LOSS VENTRAL ABDOMINAL AREA
				10-30-05	6:26	1	HAIR LOSS VENTRAL ABDOMINAL AREA
				10-31-05	6:44	2	HAIR LOSS VENTRAL ABDOMINAL AREA
				10-31-05	6:44	1	HAIR LOSS LEFT HINDLIMB
				11-01-05	6:44	2	HAIR LOSS VENTRAL ABDOMINAL AREA
				11-01-05	6:44	2	HAIR LOSS RIGHT HINDLIMB
				11-01-05	6:44	2	HAIR LOSS LEFT HINDLIMB
				11-02-05	7:17	1	HAIR LOSS LEFT HINDLIMB
				11-02-05	7:17	2	HAIR LOSS VENTRAL ABDOMINAL AREA
				11-03-05	6:30	2	HAIR LOSS VENTRAL ABDOMINAL AREA
				11-03-05	6:30	1	HAIR LOSS RIGHT HINDLIMB

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

TABLE RANGE: 10-24-05 TO 11-09-05

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
97222	M	150 MG LINURON	BODY/INTEGUMENT	11-03-05	6:30	1	HAIR LOSS LEFT HINDLIMB
				11-04-05	6:35	3	HAIR LOSS VENTRAL ABDOMINAL AREA
				11-04-05	6:35	2	HAIR LOSS RUMP
				11-04-05	6:35	2	HAIR LOSS RIGHT HINDLIMB
				11-04-05	6:35	2	HAIR LOSS LEFT HINDLIMB
				11-04-05	6:35	2	HAIR LOSS UROGENITAL AREA
				11-04-05	6:35	1	HAIR LOSS ANOGENITAL AREA
				11-04-05	6:35	1	HAIR LOSS BASE OF TAIL
				11-05-05	6:28	2	HAIR LOSS LEFT HINDLIMB
				11-05-05	6:28	3	HAIR LOSS RIGHT HINDLIMB
				11-05-05	6:28	2	HAIR LOSS VENTRAL ABDOMINAL AREA
				11-05-05	6:28	2	HAIR LOSS VENTRAL THORACIC AREA
				11-05-05	6:29	1	HAIR LOSS ANOGENITAL AREA
				11-05-05	6:29	1	HAIR LOSS UROGENITAL AREA
				11-06-05	6:32	3	HAIR LOSS VENTRAL ABDOMINAL AREA
				11-06-05	6:32	2	HAIR LOSS RUMP
				11-06-05	6:32	2	HAIR LOSS RIGHT HINDLIMB
				11-06-05	6:32	3	HAIR LOSS LEFT HINDLIMB
				11-06-05	6:32	2	HAIR LOSS UROGENITAL AREA
				11-06-05	6:32	2	HAIR LOSS VENTRAL THORACIC AREA
				11-06-05	6:32	2	HAIR LOSS ANOGENITAL AREA
				11-06-05	6:32	2	HAIR LOSS BASE OF TAIL
				11-07-05	7:48	3	HAIR LOSS VENTRAL ABDOMINAL AREA
				11-07-05	7:48	2	HAIR LOSS VENTRAL THORACIC AREA
				11-07-05	7:48	2	HAIR LOSS RIGHT HINDLIMB
				11-07-05	7:48	2	HAIR LOSS LEFT HINDLIMB
				11-07-05	7:48	1	HAIR LOSS UROGENITAL AREA
				11-07-05	7:48	1	HAIR LOSS BASE OF TAIL
				11-08-05	7:21	3	HAIR LOSS VENTRAL ABDOMINAL AREA

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

TABLE RANGE: 10-24-05 TO 11-09-05

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
97222	M	150 MG LINURON	BODY/INTEGUMENT	11-08-05	7:21	2	HAIR LOSS VENTRAL THORACIC AREA
				11-08-05	7:21	2	HAIR LOSS RIGHT HINDLIMB
				11-08-05	7:21	2	HAIR LOSS LEFT HINDLIMB
				11-08-05	7:21	2	HAIR LOSS UROGENITAL AREA
				11-08-05	7:21	1	HAIR LOSS BASE OF TAIL
				11-08-05	7:22	1	HAIR LOSS ANOGENITAL AREA
				11-08-05	7:22	1	HAIR LOSS RUMP
				11-09-05	6:34	3	HAIR LOSS VENTRAL ABDOMINAL AREA
				11-09-05	6:34	2	HAIR LOSS VENTRAL THORACIC AREA
				11-09-05	6:34	2	HAIR LOSS RIGHT HINDLIMB
				11-09-05	6:34	2	HAIR LOSS LEFT HINDLIMB
				11-09-05	6:34	2	HAIR LOSS UROGENITAL AREA
				11-09-05	6:34	1	HAIR LOSS BASE OF TAIL
				11-09-05	6:34	1	HAIR LOSS RUMP
				11-09-05	6:34	1	HAIR LOSS ANOGENITAL AREA
97222	M	150 MG LINURON	EYES/EARS/NOSE	10-27-05	7:18	1	DRIED RED MATERIAL AROUND NOSE
				10-27-05	7:18	1	DRIED RED MATERIAL AROUND LEFT EYE
				10-27-05	7:18	2	DRIED RED MATERIAL AROUND RIGHT EYE
				10-28-05	7:05	1	DRIED RED MATERIAL AROUND RIGHT EYE
				10-29-05	6:30	1	DRIED RED MATERIAL AROUND RIGHT EYE
				10-30-05	6:26	1	DRIED RED MATERIAL AROUND RIGHT EYE
97222	M	150 MG LINURON	EXCRETA	10-27-05	7:17	P	DECREASED DEFECATION
97223	M	150 MG LINURON	DISPOSITION	10-30-05	14:23	P	EUTHANIZED IN EXTREMIS
97223	M	150 MG LINURON	BODY/INTEGUMENT	10-30-05	13:30	P	PROSTRATE
				10-30-05	13:30	P	BODY COOL TO TOUCH
97223	M	150 MG LINURON	EYES/EARS/NOSE	10-30-05	6:27	1	DRIED RED MATERIAL AROUND NOSE
97223	M	150 MG LINURON	EXCRETA	10-28-05	7:06	P	DECREASED DEFECATION
97225	M	150 MG LINURON	DISPOSITION	11-09-05	7:16	P	SCHEDULED EUTHANASIA
97231	M	150 MG LINURON	DISPOSITION	11-09-05	7:16	P	SCHEDULED EUTHANASIA

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

TABLE RANGE: 10-24-05 TO 11-09-05

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
97231	M	150 MG LINURON	BODY/INTEGUMENT	10-29-05	6:32	1	HAIR LOSS VENTRAL ABDOMINAL AREA
				10-29-05	6:32	2	HAIR LOSS LEFT HINDLIMB
				10-29-05	6:32	1	HAIR LOSS RIGHT HINDLIMB
				10-29-05	6:33	1	HAIR LOSS RUMP
				10-29-05	6:33	1	HAIR LOSS ANOGENITAL AREA
				10-30-05	6:27	2	HAIR LOSS VENTRAL ABDOMINAL AREA
				10-30-05	6:28	2	HAIR LOSS RIGHT HINDLIMB
				10-30-05	6:28	2	HAIR LOSS LEFT HINDLIMB
				10-30-05	6:28	1	HAIR LOSS UROGENITAL AREA
				10-30-05	6:28	1	HAIR LOSS ANOGENITAL AREA
				10-30-05	6:29	1	HAIR LOSS RUMP
				10-30-05	6:29	1	HAIR LOSS BASE OF TAIL
				10-31-05	6:45	3	HAIR LOSS VENTRAL ABDOMINAL AREA
				10-31-05	6:45	2	HAIR LOSS RIGHT HINDLIMB
				10-31-05	6:45	2	HAIR LOSS LEFT HINDLIMB
				10-31-05	6:45	2	HAIR LOSS ANOGENITAL AREA
				10-31-05	6:45	2	HAIR LOSS BASE OF TAIL
				10-31-05	6:45	2	HAIR LOSS UROGENITAL AREA
				10-31-05	6:45	1	HAIR LOSS RUMP
				11-01-05	6:45	1	HAIR LOSS RIGHT FORELIMB
				11-01-05	6:45	1	HAIR LOSS LEFT FORELIMB
				11-01-05	6:45	2	HAIR LOSS VENTRAL ABDOMINAL AREA
				11-01-05	6:45	2	HAIR LOSS RUMP
				11-01-05	6:45	2	HAIR LOSS RIGHT HINDLIMB
				11-01-05	6:45	2	HAIR LOSS LEFT HINDLIMB
				11-01-05	6:45	1	HAIR LOSS UROGENITAL AREA
				11-01-05	6:45	1	HAIR LOSS VENTRAL THORACIC AREA
				11-01-05	6:45	1	HAIR LOSS ANOGENITAL AREA
				11-01-05	6:45	2	HAIR LOSS BASE OF TAIL

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

TABLE RANGE: 10-24-05 TO 11-09-05

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
97231	M	150 MG LINURON	BODY/INTEGUMENT	11-02-05	7:19	2	HAIR LOSS RIGHT HINDLIMB
				11-02-05	7:19	2	HAIR LOSS LEFT HINDLIMB
				11-02-05	7:19	2	HAIR LOSS VENTRAL ABDOMINAL AREA
				11-02-05	7:19	2	HAIR LOSS ANOGENITAL AREA
				11-03-05	6:30	3	HAIR LOSS VENTRAL ABDOMINAL AREA
				11-03-05	6:30	3	HAIR LOSS UROGENITAL AREA
				11-03-05	6:30	3	HAIR LOSS ANOGENITAL AREA
				11-03-05	6:30	2	HAIR LOSS RIGHT HINDLIMB
				11-03-05	6:30	2	HAIR LOSS LEFT HINDLIMB
				11-03-05	6:31	2	HAIR LOSS BASE OF TAIL
				11-04-05	6:36	3	HAIR LOSS VENTRAL ABDOMINAL AREA
				11-04-05	6:36	2	HAIR LOSS RIGHT HINDLIMB
				11-04-05	6:36	2	HAIR LOSS LEFT HINDLIMB
				11-04-05	6:36	3	HAIR LOSS UROGENITAL AREA
				11-04-05	6:36	2	HAIR LOSS RUMP
				11-04-05	6:36	3	HAIR LOSS ANOGENITAL AREA
				11-04-05	6:37	1	HAIR LOSS BASE OF TAIL
				11-05-05	6:29	3	HAIR LOSS VENTRAL ABDOMINAL AREA
				11-05-05	6:29	3	HAIR LOSS RIGHT HINDLIMB
				11-05-05	6:29	3	HAIR LOSS LEFT HINDLIMB
				11-05-05	6:29	2	HAIR LOSS VENTRAL THORACIC AREA
				11-05-05	6:29	3	HAIR LOSS ANOGENITAL AREA
				11-05-05	6:30	2	HAIR LOSS UROGENITAL AREA
				11-05-05	6:30	1	HAIR LOSS BASE OF TAIL
				11-05-05	6:30	1	HAIR LOSS RUMP
				11-06-05	6:33	3	HAIR LOSS VENTRAL ABDOMINAL AREA
				11-06-05	6:33	2	HAIR LOSS RIGHT HINDLIMB
				11-06-05	6:33	2	HAIR LOSS LEFT HINDLIMB
				11-06-05	6:33	3	HAIR LOSS UROGENITAL AREA

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

TABLE RANGE: 10-24-05 TO 11-09-05

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
97231	M	150 MG LINURON	BODY/INTEGUMENT	11-06-05	6:33	2	HAIR LOSS VENTRAL THORACIC AREA
				11-06-05	6:33	2	HAIR LOSS ANOGENITAL AREA
				11-06-05	6:33	1	HAIR LOSS BASE OF TAIL
				11-07-05	7:49	3	HAIR LOSS VENTRAL ABDOMINAL AREA
				11-07-05	7:49	2	HAIR LOSS RUMP
				11-07-05	7:49	2	HAIR LOSS RIGHT HINDLIMB
				11-07-05	7:49	2	HAIR LOSS LEFT HINDLIMB
				11-07-05	7:49	3	HAIR LOSS UROGENITAL AREA
				11-07-05	7:49	2	HAIR LOSS VENTRAL THORACIC AREA
				11-07-05	7:49	2	HAIR LOSS ANOGENITAL AREA
				11-07-05	7:49	2	HAIR LOSS BASE OF TAIL
				11-08-05	7:22	3	HAIR LOSS VENTRAL ABDOMINAL AREA
				11-08-05	7:23	2	HAIR LOSS RIGHT HINDLIMB
				11-08-05	7:23	2	HAIR LOSS LEFT HINDLIMB
				11-08-05	7:23	2	HAIR LOSS UROGENITAL AREA
				11-08-05	7:23	2	HAIR LOSS VENTRAL THORACIC AREA
				11-08-05	7:23	2	HAIR LOSS ANOGENITAL AREA
				11-08-05	7:23	1	HAIR LOSS BASE OF TAIL
				11-08-05	7:23	1	HAIR LOSS RUMP
				11-09-05	6:38	3	HAIR LOSS VENTRAL ABDOMINAL AREA
				11-09-05	6:38	3	HAIR LOSS VENTRAL THORACIC AREA
				11-09-05	6:38	2	HAIR LOSS RIGHT HINDLIMB
				11-09-05	6:38	2	HAIR LOSS LEFT HINDLIMB
				11-09-05	6:38	3	HAIR LOSS UROGENITAL AREA
				11-09-05	6:38	3	HAIR LOSS ANOGENITAL AREA
				11-09-05	6:39	2	HAIR LOSS RUMP
				11-09-05	6:39	2	HAIR LOSS BASE OF TAIL
97231	M	150 MG LINURON	EYES/EARS/NOSE	10-27-05	7:19	1	DRIED RED MATERIAL AROUND NOSE
97231	M	150 MG LINURON	EXCRETA	11-01-05	6:46	P	DECREASED DEFECATION

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

TABLE RANGE: 10-24-05 TO 11-09-05

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
97121	M	25 MG PHENO	DISPOSITION	11-07-05	7:27	P	SCHEDULED EUTHANASIA
97121	M	25 MG PHENO	BODY/INTEGUMENT	10-29-05	6:35	1	HAIR LOSS DORSAL NECK
				10-30-05	6:30	1	HAIR LOSS DORSAL NECK
97127	M	25 MG PHENO	DISPOSITION	11-07-05	7:27	P	SCHEDULED EUTHANASIA
97131	M	25 MG PHENO	DISPOSITION	11-07-05	7:27	P	SCHEDULED EUTHANASIA
97133	M	25 MG PHENO	DISPOSITION	11-07-05	7:27	P	SCHEDULED EUTHANASIA
97133	M	25 MG PHENO	BODY/INTEGUMENT	11-01-05	6:47	1	HAIR LOSS RIGHT FORELIMB
				11-01-05	6:47	1	HAIR LOSS LEFT FORELIMB
				11-06-05	6:35	1	HAIR LOSS RIGHT FORELIMB
				11-06-05	6:35	1	HAIR LOSS LEFT FORELIMB
97134	M	25 MG PHENO	DISPOSITION	11-07-05	7:27	P	SCHEDULED EUTHANASIA
97141	M	25 MG PHENO	DISPOSITION	11-08-05	7:13	P	SCHEDULED EUTHANASIA
97143	M	25 MG PHENO	DISPOSITION	11-08-05	7:13	P	SCHEDULED EUTHANASIA
97151	M	25 MG PHENO	DISPOSITION	11-08-05	7:13	P	SCHEDULED EUTHANASIA
97155	M	25 MG PHENO	DISPOSITION	11-08-05	7:13	P	SCHEDULED EUTHANASIA
97173	M	25 MG PHENO	DISPOSITION	11-08-05	7:13	P	SCHEDULED EUTHANASIA
97173	M	25 MG PHENO	EYES/EARS/NOSE	10-30-05	6:33	1	DRIED RED MATERIAL AROUND NOSE
97180	M	25 MG PHENO	DISPOSITION	11-09-05	7:16	P	SCHEDULED EUTHANASIA
97186	M	25 MG PHENO	DISPOSITION	11-09-05	7:17	P	SCHEDULED EUTHANASIA
97218	M	25 MG PHENO	DISPOSITION	11-09-05	7:17	P	SCHEDULED EUTHANASIA
97233	M	25 MG PHENO	DISPOSITION	11-09-05	7:17	P	SCHEDULED EUTHANASIA
97235	M	25 MG PHENO	DISPOSITION	11-09-05	7:17	P	SCHEDULED EUTHANASIA
97235	M	25 MG PHENO	EYES/EARS/NOSE	10-28-05	7:13	1	DRIED RED MATERIAL AROUND LEFT EYE
				10-28-05	7:13	1	DRIED RED MATERIAL AROUND RIGHT EYE
				11-01-05	6:52	1	DRIED RED MATERIAL AROUND RIGHT EYE
				11-02-05	7:28	1	DRIED RED MATERIAL AROUND RIGHT EYE
				11-03-05	6:36	1	DRIED RED MATERIAL AROUND RIGHT EYE
				11-04-05	6:41	1	DRIED RED MATERIAL AROUND RIGHT EYE
97123	M	50 MG PHENO	DISPOSITION	11-07-05	7:27	P	SCHEDULED EUTHANASIA

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

TABLE RANGE: 10-24-05 TO 11-09-05

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
97123	M	50 MG PHENO	BODY/INTEGUMENT	11-05-05	6:34	1	HAIR LOSS RIGHT FORELIMB
97129	M	50 MG PHENO	DISPOSITION	11-07-05	7:27	P	SCHEDULED EUTHANASIA
97135	M	50 MG PHENO	DISPOSITION	11-07-05	7:28	P	SCHEDULED EUTHANASIA
97139	M	50 MG PHENO	DISPOSITION	11-07-05	7:28	P	SCHEDULED EUTHANASIA
97146	M	50 MG PHENO	DISPOSITION	11-07-05	7:28	P	SCHEDULED EUTHANASIA
97149	M	50 MG PHENO	DISPOSITION	11-08-05	7:13	P	SCHEDULED EUTHANASIA
97149	M	50 MG PHENO	EYES/EARS/NOSE	10-29-05	6:40	1	DRIED RED MATERIAL AROUND NOSE
97183	M	50 MG PHENO	DISPOSITION	11-08-05	7:14	P	SCHEDULED EUTHANASIA
97183	M	50 MG PHENO	EYES/EARS/NOSE	10-29-05	6:40	1	DRIED RED MATERIAL AROUND NOSE
97190	M	50 MG PHENO	DISPOSITION	11-08-05	7:14	P	SCHEDULED EUTHANASIA
97195	M	50 MG PHENO	DISPOSITION	11-08-05	7:14	P	SCHEDULED EUTHANASIA
97195	M	50 MG PHENO	BODY/INTEGUMENT	10-31-05	6:57	1	HAIR LOSS RIGHT FORELIMB
				10-31-05	6:57	1	HAIR LOSS LEFT FORELIMB
				11-01-05	6:56	1	HAIR LOSS RIGHT FORELIMB
				11-01-05	6:56	1	HAIR LOSS LEFT FORELIMB
				11-02-05	7:32	1	HAIR LOSS RIGHT FORELIMB
				11-02-05	7:32	1	HAIR LOSS LEFT FORELIMB
				11-03-05	6:39	1	HAIR LOSS RIGHT FORELIMB
				11-03-05	6:39	1	HAIR LOSS LEFT FORELIMB
				11-04-05	6:44	1	HAIR LOSS RIGHT FORELIMB
				11-04-05	6:44	1	HAIR LOSS LEFT FORELIMB
				11-05-05	6:36	1	HAIR LOSS RIGHT FORELIMB
				11-05-05	6:36	1	HAIR LOSS LEFT FORELIMB
				11-06-05	6:41	1	HAIR LOSS RIGHT FORELIMB
				11-06-05	6:41	1	HAIR LOSS LEFT FORELIMB
				11-07-05	7:53	1	HAIR LOSS RIGHT FORELIMB
				11-07-05	7:53	1	HAIR LOSS LEFT FORELIMB
97203	M	50 MG PHENO	DISPOSITION	11-08-05	7:14	P	SCHEDULED EUTHANASIA
97215	M	50 MG PHENO	DISPOSITION	11-09-05	7:17	P	SCHEDULED EUTHANASIA

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

TABLE RANGE: 10-24-05 TO 11-09-05

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
97228	M	50 MG PHENO	DISPOSITION	11-09-05	7:17	P	SCHEDULED EUTHANASIA
97229	M	50 MG PHENO	DISPOSITION	11-09-05	7:17	P	SCHEDULED EUTHANASIA
97230	M	50 MG PHENO	DISPOSITION	11-09-05	7:17	P	SCHEDULED EUTHANASIA
97232	M	50 MG PHENO	DISPOSITION	11-09-05	7:17	P	SCHEDULED EUTHANASIA
97120	M	100 MG PHENO	DISPOSITION	11-07-05	7:28	P	SCHEDULED EUTHANASIA
97120	M	100 MG PHENO	EYES/EARS/NOSE	10-25-05	6:38	1	DRIED RED MATERIAL AROUND LEFT EYE
				10-26-05	6:55	1	DRIED RED MATERIAL AROUND LEFT EYE
				10-26-05	6:55	1	DRIED RED MATERIAL AROUND RIGHT EYE
				10-28-05	7:18	1	DRIED RED MATERIAL AROUND LEFT EYE
				10-28-05	7:18	1	DRIED RED MATERIAL AROUND RIGHT EYE
				10-29-05	6:44	1	DRIED RED MATERIAL AROUND LEFT EYE
				10-30-05	6:41	1	DRIED RED MATERIAL AROUND LEFT EYE
				10-31-05	6:59	1	DRIED RED MATERIAL AROUND LEFT EYE
				10-31-05	6:59	1	DRIED RED MATERIAL AROUND RIGHT EYE
				11-01-05	6:59	1	DRIED RED MATERIAL AROUND LEFT EYE
				11-01-05	6:59	1	DRIED RED MATERIAL AROUND RIGHT EYE
				11-02-05	7:36	1	DRIED RED MATERIAL AROUND RIGHT EYE
				11-03-05	6:41	1	DRIED RED MATERIAL AROUND RIGHT EYE
				11-04-05	6:47	1	DRIED RED MATERIAL AROUND RIGHT EYE
				11-05-05	6:39	1	DRIED RED MATERIAL AROUND RIGHT EYE
				11-06-05	6:43	1	DRIED RED MATERIAL AROUND RIGHT EYE
97130	M	100 MG PHENO	DISPOSITION	11-07-05	7:28	P	SCHEDULED EUTHANASIA
97130	M	100 MG PHENO	EYES/EARS/NOSE	10-25-05	6:39	1	DRIED RED MATERIAL AROUND LEFT EYE
				10-25-05	6:39	1	DRIED RED MATERIAL AROUND RIGHT EYE
				10-26-05	6:55	2	DRIED RED MATERIAL AROUND RIGHT EYE
				10-26-05	6:55	1	DRIED RED MATERIAL AROUND LEFT EYE
				10-26-05	6:55	1	DRIED RED MATERIAL AROUND NOSE
				10-27-05	7:30	1	DRIED RED MATERIAL AROUND LEFT EYE
				10-27-05	7:30	1	DRIED RED MATERIAL AROUND RIGHT EYE

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

TABLE RANGE: 10-24-05 TO 11-09-05

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
97130	M	100 MG PHENO	EYES/EARS/NOSE	10-28-05	7:18	1	DRIED RED MATERIAL AROUND LEFT EYE
				10-28-05	7:18	1	DRIED RED MATERIAL AROUND RIGHT EYE
				10-28-05	7:18	1	DRIED RED MATERIAL AROUND NOSE
				10-29-05	6:44	1	DRIED RED MATERIAL AROUND LEFT EYE
				10-29-05	6:44	1	DRIED RED MATERIAL AROUND RIGHT EYE
				10-30-05	6:41	1	DRIED RED MATERIAL AROUND RIGHT EYE
				11-03-05	6:42	1	DRIED RED MATERIAL AROUND LEFT EYE
97145	M	100 MG PHENO	DISPOSITION	11-07-05	7:28	P	SCHEDULED EUTHANASIA
97145	M	100 MG PHENO	EYES/EARS/NOSE	10-26-05	6:56	2	DRIED RED MATERIAL AROUND LEFT EYE
				10-26-05	6:56	2	DRIED RED MATERIAL AROUND RIGHT EYE
				10-26-05	6:56	1	DRIED RED MATERIAL AROUND NOSE
				10-27-05	7:30	1	DRIED RED MATERIAL AROUND NOSE
				10-27-05	7:30	2	DRIED RED MATERIAL AROUND RIGHT EYE
				10-27-05	7:30	1	DRIED RED MATERIAL AROUND LEFT EYE
				10-28-05	7:19	1	DRIED RED MATERIAL AROUND LEFT EYE
				10-29-05	6:45	1	DRIED RED MATERIAL AROUND RIGHT EYE
				10-30-05	6:42	1	DRIED RED MATERIAL AROUND RIGHT EYE
97154	M	100 MG PHENO	DISPOSITION	11-07-05	7:28	P	SCHEDULED EUTHANASIA
97154	M	100 MG PHENO	EYES/EARS/NOSE	10-26-05	6:57	1	DRIED RED MATERIAL AROUND LEFT EYE
				10-27-05	7:31	1	DRIED RED MATERIAL AROUND NOSE
				10-27-05	7:31	1	DRIED RED MATERIAL AROUND RIGHT EYE
				10-28-05	7:19	1	DRIED RED MATERIAL AROUND RIGHT EYE
				10-29-05	6:45	1	DRIED RED MATERIAL AROUND LEFT EYE
				10-30-05	6:42	1	DRIED RED MATERIAL AROUND LEFT EYE
				10-31-05	7:02	1	DRIED RED MATERIAL AROUND LEFT EYE
97158	M	100 MG PHENO	DISPOSITION	11-07-05	7:28	P	SCHEDULED EUTHANASIA
97158	M	100 MG PHENO	EYES/EARS/NOSE	10-25-05	6:40	1	DRIED RED MATERIAL AROUND RIGHT EYE
				10-25-05	6:40	1	DRIED RED MATERIAL AROUND NOSE
				10-26-05	6:57	1	DRIED RED MATERIAL AROUND NOSE

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

TABLE RANGE: 10-24-05 TO 11-09-05

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
97158	M	100 MG PHENO	EYES/EARS/NOSE	10-27-05	7:31	1	DRIED RED MATERIAL AROUND RIGHT EYE
				10-28-05	7:20	1	DRIED RED MATERIAL AROUND LEFT EYE
97160	M	100 MG PHENO	DISPOSITION	11-08-05	7:14	P	SCHEDULED EUTHANASIA
97175	M	100 MG PHENO	DISPOSITION	10-28-05	6:35	P	FOUND DEAD
97175	M	100 MG PHENO	BODY/INTEGUMENT	10-27-05	15:30	P	BODY COOL TO TOUCH
				10-27-05	15:30	P	UNCONSCIOUS AND UNRESPONSIVE
				10-27-05	15:30	P	LATERAL RECUMBENCY
97175	M	100 MG PHENO	CARDIO-PULMONARY	10-27-05	15:30	1	RALES
97175	M	100 MG PHENO	EYES/EARS/NOSE	10-26-05	6:58	1	DRIED RED MATERIAL AROUND LEFT EYE
				10-26-05	6:58	1	DRIED RED MATERIAL AROUND RIGHT EYE
				10-27-05	7:32	2	DRIED RED MATERIAL AROUND NOSE
				10-27-05	7:32	1	DRIED RED MATERIAL AROUND LEFT EYE
				10-27-05	7:32	2	DRIED RED MATERIAL AROUND RIGHT EYE
97177	M	100 MG PHENO	DISPOSITION	11-08-05	7:14	P	SCHEDULED EUTHANASIA
97182	M	100 MG PHENO	DISPOSITION	11-08-05	7:14	P	SCHEDULED EUTHANASIA
97187	M	100 MG PHENO	DISPOSITION	11-08-05	7:14	P	SCHEDULED EUTHANASIA
97187	M	100 MG PHENO	EYES/EARS/NOSE	10-27-05	7:34	1	DRIED RED MATERIAL AROUND LEFT EYE
				10-27-05	7:34	1	DRIED RED MATERIAL AROUND RIGHT EYE
				10-28-05	7:21	1	DRIED RED MATERIAL AROUND RIGHT EYE
				10-28-05	7:21	1	DRIED RED MATERIAL AROUND LEFT EYE
97191	M	100 MG PHENO	DISPOSITION	11-09-05	7:18	P	SCHEDULED EUTHANASIA
97191	M	100 MG PHENO	EYES/EARS/NOSE	10-28-05	7:21	1	DRIED RED MATERIAL AROUND NOSE
				10-28-05	7:21	1	DRIED RED MATERIAL AROUND LEFT EYE
				10-28-05	7:21	1	DRIED RED MATERIAL AROUND RIGHT EYE
				10-29-05	6:47	1	DRIED RED MATERIAL AROUND LEFT EYE
				10-29-05	6:47	1	DRIED RED MATERIAL AROUND RIGHT EYE
				10-30-05	6:44	1	DRIED RED MATERIAL AROUND LEFT EYE
				10-30-05	6:44	1	DRIED RED MATERIAL AROUND RIGHT EYE
				11-01-05	7:04	1	DRIED RED MATERIAL AROUND NOSE

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

TABLE RANGE: 10-24-05 TO 11-09-05

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
97191	M	100 MG PHENO	EYES/EARS/NOSE	11-03-05	6:44	1	DRIED RED MATERIAL AROUND NOSE
97194	M	100 MG PHENO	DISPOSITION	11-09-05	7:18	P	SCHEDULED EUTHANASIA
97194	M	100 MG PHENO	BODY/INTEGUMENT	10-29-05	6:48	1	WET YELLOW MATERIAL UROGENITAL AREA
				10-30-05	6:45	1	DRIED YELLOW MATERIAL UROGENITAL AREA
				10-31-05	7:06	1	WET YELLOW MATERIAL UROGENITAL AREA
97194	M	100 MG PHENO	EYES/EARS/NOSE	10-28-05	7:22	1	DRIED RED MATERIAL AROUND NOSE
				10-28-05	7:22	1	DRIED RED MATERIAL AROUND LEFT EYE
				10-28-05	7:22	1	DRIED RED MATERIAL AROUND RIGHT EYE
				10-29-05	6:48	2	DRIED RED MATERIAL AROUND LEFT EYE
				10-29-05	6:48	2	DRIED RED MATERIAL AROUND NOSE
				10-30-05	6:44	1	DRIED RED MATERIAL AROUND RIGHT EYE
97194	M	100 MG PHENO	EXCRETA	10-30-05	6:45	P	DECREASED DEFECATION
				10-31-05	7:06	P	DECREASED DEFECATION
97209	M	100 MG PHENO	DISPOSITION	11-09-05	7:18	P	SCHEDULED EUTHANASIA
97209	M	100 MG PHENO	EYES/EARS/NOSE	10-28-05	7:23	1	DRIED RED MATERIAL AROUND LEFT EYE
				10-28-05	7:23	1	DRIED RED MATERIAL AROUND NOSE
				10-30-05	6:45	1	DRIED RED MATERIAL AROUND LEFT EYE
97216	M	100 MG PHENO	DISPOSITION	11-09-05	7:18	P	SCHEDULED EUTHANASIA
97216	M	100 MG PHENO	EYES/EARS/NOSE	10-30-05	6:46	1	DRIED RED MATERIAL AROUND LEFT EYE
97224	M	100 MG PHENO	DISPOSITION	11-09-05	7:18	P	SCHEDULED EUTHANASIA
97224	M	100 MG PHENO	EYES/EARS/NOSE	10-28-05	7:23	1	DRIED RED MATERIAL AROUND RIGHT EYE
				10-29-05	6:49	1	DRIED RED MATERIAL AROUND LEFT EYE
				10-29-05	6:49	1	DRIED RED MATERIAL AROUND RIGHT EYE
				10-30-05	6:46	1	DRIED RED MATERIAL AROUND LEFT EYE
				10-31-05	7:07	1	DRIED RED MATERIAL AROUND LEFT EYE
				10-31-05	7:07	1	DRIED RED MATERIAL AROUND RIGHT EYE

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

6 HOURS POST-DOSING

PROJECT NO.:WIL-431014 INTER-LAB 15-DAY MALE RAT ASSAY WITH LINURON & PHENOBARBITAL PAGE 1

SPONSOR:BATTELLE INDIVIDUAL CLINICAL OBSERVATIONS [POSITIVE FINDINGS ONLY]

SPONSOR NO.:68-W-01-023

TABLE RANGE: 10-24-05 TO 11-09-05

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
97128	M	150 MG LINURON	BEHAVIOR/CNS	10-26-05	13:58	P	IMPAIRED MOBILITY
97140	M	150 MG LINURON	BEHAVIOR/CNS	10-26-05	13:58	P	IMPAIRED MOBILITY
97142	M	150 MG LINURON	BEHAVIOR/CNS	10-25-05	13:20	P	IMPAIRED MOBILITY
				10-26-05	13:59	P	IMPAIRED MOBILITY
				10-28-05	14:13	2	PILOERECTION
				10-28-05	14:13	P	ROCKS, LURCHES, OR SWAYS AS IT WALKS
				11-01-05	14:18	P	HYPOACTIVITY
				11-02-05	15:08	P	HYPOACTIVITY
				11-03-05	14:07	P	IMPAIRED MOBILITY
				11-03-05	14:07	P	HYPOACTIVITY
				11-03-05	14:07	P	ROCKS, LURCHES, OR SWAYS AS IT WALKS
97144	M	150 MG LINURON	BEHAVIOR/CNS	10-28-05	14:14	P	ROCKS, LURCHES, OR SWAYS AS IT WALKS
				10-28-05	14:15	P	HYPOACTIVITY
97161	M	150 MG LINURON	BEHAVIOR/CNS	10-25-05	13:21	P	IMPAIRED MOBILITY
				10-26-05	13:59	P	IMPAIRED MOBILITY
				10-26-05	13:59	P	LYING ON SIDE; LIMBS EXTENDED
				10-28-05	14:16	1	PILOERECTION
				10-28-05	14:16	P	HYPOACTIVITY
				10-31-05	15:03	P	IMPAIRED MOBILITY
				10-31-05	15:03	P	ROCKS, LURCHES, OR SWAYS AS IT WALKS
				11-01-05	14:19	P	IMPAIRED MOBILITY
				11-01-05	14:19	P	ROCKS, LURCHES, OR SWAYS AS IT WALKS
				11-01-05	14:19	P	HYPOACTIVITY
				11-02-05	15:09	P	IMPAIRED MOBILITY
				11-02-05	15:09	P	ROCKS, LURCHES, OR SWAYS AS IT WALKS
				11-02-05	15:09	P	HYPOACTIVITY
				11-04-05	13:56	P	IMPAIRED MOBILITY
				11-04-05	13:56	P	ROCKS, LURCHES, OR SWAYS AS IT WALKS
				11-04-05	13:56	P	HYPOACTIVITY

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

TABLE RANGE: 10-24-05 TO 11-09-05

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
97162	M	150 MG LINURON	BEHAVIOR/CNS	10-26-05	13:59	P	IMPAIRED MOBILITY
				10-31-05	15:03	P	IMPAIRED MOBILITY
				10-31-05	15:03	P	ROCKS, LURCHES, OR SWAYS AS IT WALKS
				11-01-05	14:20	P	HYPOACTIVITY
				11-02-05	15:10	P	IMPAIRED MOBILITY
				11-02-05	15:10	P	ROCKS, LURCHES, OR SWAYS AS IT WALKS
				11-02-05	15:10	P	HYPOACTIVITY
				11-03-05	14:08	P	HYPOACTIVITY
				11-03-05	14:08	P	IMPAIRED MOBILITY
				11-03-05	14:08	P	ROCKS, LURCHES, OR SWAYS AS IT WALKS
				11-04-05	13:57	P	IMPAIRED MOBILITY
				11-04-05	13:57	P	ROCKS, LURCHES, OR SWAYS AS IT WALKS
				11-04-05	13:57	P	HYPOACTIVITY
				11-05-05	13:25	P	IMPAIRED MOBILITY
				11-05-05	13:25	P	ROCKS, LURCHES, OR SWAYS AS IT WALKS
				11-05-05	13:25	P	HYPOACTIVITY
				11-06-05	14:29	P	IMPAIRED MOBILITY
				11-06-05	14:30	P	ROCKS, LURCHES, OR SWAYS AS IT WALKS
				11-06-05	14:30	P	HYPOACTIVITY
97171	M	150 MG LINURON	BEHAVIOR/CNS	10-26-05	14:00	P	IMPAIRED MOBILITY
				10-27-05	14:34	P	IMPAIRED MOBILITY
				10-28-05	14:17	P	ROCKS, LURCHES, OR SWAYS AS IT WALKS
97174	M	150 MG LINURON	BEHAVIOR/CNS	10-26-05	14:00	P	IMPAIRED MOBILITY
				10-28-05	14:18	P	IMPAIRED MOBILITY
				10-31-05	15:04	P	IMPAIRED MOBILITY
				10-31-05	15:04	P	ROCKS, LURCHES, OR SWAYS AS IT WALKS
				11-04-05	13:57	P	IMPAIRED MOBILITY
				11-04-05	13:57	P	ROCKS, LURCHES, OR SWAYS AS IT WALKS
97207	M	150 MG LINURON	BEHAVIOR/CNS	10-26-05	14:00	P	IMPAIRED MOBILITY

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

TABLE RANGE: 10-24-05 TO 11-09-05

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
97207	M	150 MG LINURON	BEHAVIOR/CNS	10-27-05	14:35	P	IMPAIRED MOBILITY
				10-27-05	14:35	P	LYING ON SIDE; LIMBS EXTENDED
				10-28-05	14:21	P	HYPOACTIVITY
				11-01-05	14:21	P	HYPOACTIVITY
				11-02-05	15:11	P	HYPOACTIVITY
97211	M	150 MG LINURON	BEHAVIOR/CNS	10-26-05	14:01	P	IMPAIRED MOBILITY
				10-27-05	14:35	P	IMPAIRED MOBILITY
				10-28-05	14:22	P	HYPOACTIVITY
				10-31-05	15:04	P	IMPAIRED MOBILITY
				10-31-05	15:04	P	ROCKS, LURCHES, OR SWAYS AS IT WALKS
				11-01-05	14:22	P	HYPOACTIVITY
97214	M	150 MG LINURON	BEHAVIOR/CNS	10-27-05	14:36	P	IMPAIRED MOBILITY
				10-28-05	14:23	P	IMPAIRED MOBILITY
				11-01-05	14:22	P	IMPAIRED MOBILITY
				11-01-05	14:22	P	ROCKS, LURCHES, OR SWAYS AS IT WALKS
				11-01-05	14:23	P	HYPOACTIVITY
				11-02-05	15:12	P	IMPAIRED MOBILITY
				11-02-05	15:12	P	ROCKS, LURCHES, OR SWAYS AS IT WALKS
				11-02-05	15:12	P	HYPOACTIVITY
				11-03-05	14:13	P	IMPAIRED MOBILITY
				11-03-05	14:13	P	ROCKS, LURCHES, OR SWAYS AS IT WALKS
				11-03-05	14:13	P	HYPOACTIVITY
				11-04-05	13:59	P	IMPAIRED MOBILITY
				11-04-05	13:59	P	ROCKS, LURCHES, OR SWAYS AS IT WALKS
				11-04-05	13:59	P	HYPOACTIVITY
97223	M	150 MG LINURON	BEHAVIOR/CNS	10-27-05	14:37	P	IMPAIRED MOBILITY
				10-28-05	14:23	P	ROCKS, LURCHES, OR SWAYS AS IT WALKS
				10-30-05	13:16	P	IMPAIRED MOBILITY
				10-30-05	13:16	P	LYING ON SIDE; LIMBS EXTENDED

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

TABLE RANGE: 10-24-05 TO 11-09-05

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
97223	M	150 MG LINURON	BEHAVIOR/CNS	10-30-05	13:16	P	HYPOACTIVITY
97223	M	150 MG LINURON	BODY/INTEGUMENT	10-30-05	13:17	P	BODY COOL TO TOUCH
97223	M	150 MG LINURON	EYES/EARS/NOSE	10-30-05	13:18	3	WET RED MATERIAL AROUND RIGHT EYE
				10-30-05	13:18	3	WET RED MATERIAL AROUND LEFT EYE
97225	M	150 MG LINURON	BEHAVIOR/CNS	10-27-05	14:37	P	IMPAIRED MOBILITY
				10-28-05	14:24	P	IMPAIRED MOBILITY
				10-31-05	15:05	P	HYPOACTIVITY
97231	M	150 MG LINURON	BEHAVIOR/CNS	10-27-05	14:37	P	IMPAIRED MOBILITY
				10-28-05	14:24	1	PILOERECTION
				10-28-05	14:24	P	IMPAIRED MOBILITY
				10-31-05	15:05	P	IMPAIRED MOBILITY
				10-31-05	15:05	P	ROCKS, LURCHES, OR SWAYS AS IT WALKS
				11-01-05	14:24	P	IMPAIRED MOBILITY
				11-01-05	14:24	P	ROCKS, LURCHES, OR SWAYS AS IT WALKS
				11-01-05	14:24	P	HYPOACTIVITY
				11-02-05	15:13	P	HYPOACTIVITY
				11-04-05	14:00	P	IMPAIRED MOBILITY
				11-04-05	14:00	P	LYING ON SIDE; LIMBS EXTENDED
				11-04-05	14:00	P	HYPOACTIVITY
				11-05-05	13:26	P	IMPAIRED MOBILITY
				11-05-05	13:26	P	ROCKS, LURCHES, OR SWAYS AS IT WALKS
				11-05-05	13:26	P	HYPOACTIVITY
				11-06-05	14:32	P	IMPAIRED MOBILITY
				11-06-05	14:32	P	ROCKS, LURCHES, OR SWAYS AS IT WALKS
				11-06-05	14:32	P	HYPOACTIVITY
				11-07-05	14:43	P	IMPAIRED MOBILITY
				11-07-05	14:43	P	ROCKS, LURCHES, OR SWAYS AS IT WALKS
				11-07-05	14:43	P	HYPOACTIVITY
97120	M	100 MG PHENO	BEHAVIOR/CNS	10-24-05	14:21	P	IMPAIRED MOBILITY

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

TABLE RANGE: 10-24-05 TO 11-09-05

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
97120	M	100 MG PHENO	BEHAVIOR/CNS	10-25-05	13:34	P	IMPAIRED MOBILITY
				10-25-05	13:34	P	LYING ON SIDE; LIMBS EXTENDED
				10-26-05	14:08	P	IMPAIRED MOBILITY
				10-26-05	14:08	P	LYING ON SIDE; LIMBS EXTENDED
				10-27-05	14:43	P	IMPAIRED MOBILITY
				10-28-05	14:27	P	LYING ON SIDE; LIMBS EXTENDED
				10-30-05	13:35	P	IMPAIRED MOBILITY
				10-30-05	13:35	P	HYPOACTIVITY
				10-31-05	14:57	P	IMPAIRED MOBILITY
				10-31-05	14:57	P	LYING ON SIDE; LIMBS EXTENDED
				10-31-05	14:57	P	HYPOACTIVITY
				11-01-05	14:32	P	HYPOACTIVITY
				11-01-05	14:32	P	IMPAIRED MOBILITY
				11-01-05	14:32	P	ROCKS, LURCHES, OR SWAYS AS IT WALKS
				11-02-05	15:22	P	IMPAIRED MOBILITY
				11-02-05	15:22	P	ROCKS, LURCHES, OR SWAYS AS IT WALKS
				11-02-05	15:22	P	HYPOACTIVITY
				11-03-05	14:16	P	IMPAIRED MOBILITY
				11-03-05	14:17	P	ROCKS, LURCHES, OR SWAYS AS IT WALKS
97130	M	100 MG PHENO	BEHAVIOR/CNS	10-24-05	14:23	P	IMPAIRED MOBILITY
				10-24-05	14:23	P	LYING ON SIDE; LIMBS EXTENDED
				10-25-05	13:35	P	IMPAIRED MOBILITY
				10-26-05	14:08	P	IMPAIRED MOBILITY
				10-27-05	14:44	P	IMPAIRED MOBILITY
				10-28-05	14:28	P	IMPAIRED MOBILITY
				10-29-05	13:41	P	IMPAIRED MOBILITY
				10-30-05	13:35	P	IMPAIRED MOBILITY
				10-30-05	13:35	P	LYING ON SIDE; LIMBS EXTENDED
				10-30-05	13:35	P	HYPOACTIVITY

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

TABLE RANGE: 10-24-05 TO 11-09-05

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
97130	M	100 MG PHENO	BEHAVIOR/CNS	10-31-05	14:58	P	IMPAIRED MOBILITY
				10-31-05	14:58	P	ROCKS, LURCHES, OR SWAYS AS IT WALKS
				11-01-05	14:33	P	HYPOACTIVITY
				11-02-05	15:23	P	HYPOACTIVITY
				11-03-05	14:17	P	IMPAIRED MOBILITY
				11-03-05	14:17	P	ROCKS, LURCHES, OR SWAYS AS IT WALKS
				11-03-05	14:17	P	HYPOACTIVITY
				11-04-05	14:21	P	IMPAIRED MOBILITY
				11-04-05	14:21	P	ROCKS, LURCHES, OR SWAYS AS IT WALKS
				11-04-05	14:21	P	HYPOACTIVITY
				11-06-05	14:52	P	IMPAIRED MOBILITY
				11-06-05	14:52	P	ROCKS, LURCHES, OR SWAYS AS IT WALKS
				11-06-05	14:52	P	HYPOACTIVITY
97145	M	100 MG PHENO	BEHAVIOR/CNS	10-24-05	14:23	P	IMPAIRED MOBILITY
				10-25-05	13:35	P	IMPAIRED MOBILITY
				10-26-05	14:09	P	IMPAIRED MOBILITY
				10-26-05	14:09	P	LYING ON SIDE; LIMBS EXTENDED
				10-27-05	14:44	P	IMPAIRED MOBILITY
				10-27-05	14:44	P	LYING ON SIDE; LIMBS EXTENDED
				10-28-05	14:28	P	LYING ON SIDE; LIMBS EXTENDED
				10-29-05	13:42	P	IMPAIRED MOBILITY
				10-29-05	13:42	P	ROCKS, LURCHES, OR SWAYS AS IT WALKS
				10-30-05	13:35	P	IMPAIRED MOBILITY
				10-30-05	13:35	P	LYING ON SIDE; LIMBS EXTENDED
				10-30-05	13:36	P	ROCKS, LURCHES, OR SWAYS AS IT WALKS
				10-30-05	13:36	P	HYPOACTIVITY
				10-31-05	14:58	P	IMPAIRED MOBILITY
				10-31-05	14:58	P	LYING ON SIDE; LIMBS EXTENDED
				10-31-05	14:58	P	HYPOACTIVITY

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

TABLE RANGE: 10-24-05 TO 11-09-05

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
97145	M	100 MG PHENO	BEHAVIOR/CNS	11-01-05	14:33	P	IMPAIRED MOBILITY
				11-01-05	14:33	P	HYPOACTIVITY
				11-02-05	15:24	P	LYING ON SIDE; LIMBS EXTENDED
				11-02-05	15:24	P	IMPAIRED MOBILITY
				11-02-05	15:24	P	HYPOACTIVITY
				11-03-05	14:17	P	IMPAIRED MOBILITY
				11-03-05	14:17	P	LYING ON SIDE; LIMBS EXTENDED
				11-03-05	14:17	P	HYPOACTIVITY
				11-04-05	14:21	P	IMPAIRED MOBILITY
				11-04-05	14:21	P	LYING ON SIDE; LIMBS EXTENDED
				11-04-05	14:21	P	HYPOACTIVITY
				11-05-05	13:43	P	IMPAIRED MOBILITY
				11-05-05	13:43	P	ROCKS, LURCHES, OR SWAYS AS IT WALKS
				11-05-05	13:43	P	HYPOACTIVITY
				11-06-05	14:53	P	IMPAIRED MOBILITY
				11-06-05	14:53	P	ROCKS, LURCHES, OR SWAYS AS IT WALKS
				11-06-05	14:53	P	HYPOACTIVITY
97154	M	100 MG PHENO	BEHAVIOR/CNS	10-24-05	14:24	P	IMPAIRED MOBILITY
				10-25-05	13:36	P	IMPAIRED MOBILITY
				10-25-05	13:36	P	LYING ON SIDE; LIMBS EXTENDED
				10-26-05	14:09	P	IMPAIRED MOBILITY
				10-27-05	14:45	P	IMPAIRED MOBILITY
				10-28-05	14:28	P	IMPAIRED MOBILITY
				10-29-05	13:47	P	HYPOACTIVITY
				10-29-05	13:43	P	IMPAIRED MOBILITY
				10-31-05	14:59	P	IMPAIRED MOBILITY
				10-31-05	14:59	P	ROCKS, LURCHES, OR SWAYS AS IT WALKS
				11-01-05	14:33	P	HYPOACTIVITY
				11-02-05	15:25	P	IMPAIRED MOBILITY

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

TABLE RANGE: 10-24-05 TO 11-09-05

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
97154	M	100 MG PHENO	BEHAVIOR/CNS	11-02-05	15:25	P	ROCKS, LURCHES, OR SWAYS AS IT WALKS
				11-02-05	15:25	P	HYPOACTIVITY
				11-06-05	14:54	P	IMPAIRED MOBILITY
				11-06-05	14:54	P	ROCKS, LURCHES, OR SWAYS AS IT WALKS
				11-06-05	14:54	P	HYPOACTIVITY
97158	M	100 MG PHENO	BEHAVIOR/CNS	10-24-05	14:24	P	IMPAIRED MOBILITY
				10-25-05	13:36	P	IMPAIRED MOBILITY
				10-26-05	14:10	P	IMPAIRED MOBILITY
				10-27-05	14:45	P	IMPAIRED MOBILITY
				10-28-05	14:29	P	IMPAIRED MOBILITY
				10-29-05	13:43	P	IMPAIRED MOBILITY
				10-31-05	14:59	P	IMPAIRED MOBILITY
				10-31-05	14:59	P	ROCKS, LURCHES, OR SWAYS AS IT WALKS
				11-01-05	14:34	P	IMPAIRED MOBILITY
				11-01-05	14:34	P	LYING ON SIDE; LIMBS EXTENDED
				11-01-05	14:34	P	HYPOACTIVITY
				11-02-05	15:26	P	IMPAIRED MOBILITY
				11-02-05	15:26	P	ROCKS, LURCHES, OR SWAYS AS IT WALKS
				11-02-05	15:26	P	HYPOACTIVITY
				11-03-05	14:18	P	IMPAIRED MOBILITY
				11-03-05	14:18	P	ROCKS, LURCHES, OR SWAYS AS IT WALKS
				11-03-05	14:18	P	HYPOACTIVITY
				11-04-05	14:22	P	IMPAIRED MOBILITY
				11-04-05	14:22	P	LYING ON SIDE; LIMBS EXTENDED
				11-04-05	14:22	P	HYPOACTIVITY
				11-05-05	13:44	P	IMPAIRED MOBILITY
				11-05-05	13:44	P	ROCKS, LURCHES, OR SWAYS AS IT WALKS
				11-05-05	13:44	P	HYPOACTIVITY
				11-06-05	14:55	P	IMPAIRED MOBILITY

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

TABLE RANGE: 10-24-05 TO 11-09-05

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
97158	M	100 MG PHENO	BEHAVIOR/CNS	11-06-05	14:55	P	ROCKS, LURCHES, OR SWAYS AS IT WALKS
				11-06-05	14:55	P	HYPOACTIVITY
97160	M	100 MG PHENO	BEHAVIOR/CNS	10-25-05	13:36	P	IMPAIRED MOBILITY
				10-26-05	14:10	P	IMPAIRED MOBILITY
				10-27-05	14:47	P	IMPAIRED MOBILITY
				10-27-05	14:47	P	LYING ON SIDE; LIMBS EXTENDED
				10-28-05	14:29	P	LYING ON SIDE; LIMBS EXTENDED
				10-30-05	13:36	P	IMPAIRED MOBILITY
				10-31-05	14:59	P	IMPAIRED MOBILITY
				10-31-05	14:59	P	LYING ON SIDE; LIMBS EXTENDED
				10-31-05	14:59	P	HYPOACTIVITY
				11-02-05	15:27	P	HYPOACTIVITY
				11-06-05	14:55	P	IMPAIRED MOBILITY
				11-06-05	14:55	P	ROCKS, LURCHES, OR SWAYS AS IT WALKS
				11-06-05	14:55	P	HYPOACTIVITY
				11-07-05	14:46	P	IMPAIRED MOBILITY
				11-07-05	14:46	P	ROCKS, LURCHES, OR SWAYS AS IT WALKS
				11-07-05	14:46	P	HYPOACTIVITY
97175	M	100 MG PHENO	BEHAVIOR/CNS	10-25-05	13:37	P	IMPAIRED MOBILITY
				10-25-05	13:37	P	LYING ON SIDE; LIMBS EXTENDED
				10-26-05	14:10	P	IMPAIRED MOBILITY
				10-27-05	14:47	P	IMPAIRED MOBILITY
				10-27-05	14:47	P	LYING ON SIDE; LIMBS EXTENDED
97175	M	100 MG PHENO	CARDIO-PULMONARY	10-27-05	14:49	P	SHALLOW RESPIRATION
97175	M	100 MG PHENO	EYES/EARS/NOSE	10-27-05	14:48	1	LACRIMATION LEFT EYE
				10-27-05	14:48	1	LACRIMATION RIGHT EYE
97177	M	100 MG PHENO	BEHAVIOR/CNS	10-25-05	13:37	P	IMPAIRED MOBILITY
				10-26-05	14:11	P	IMPAIRED MOBILITY
				10-27-05	14:49	P	IMPAIRED MOBILITY

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

TABLE RANGE: 10-24-05 TO 11-09-05

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
97177	M	100 MG PHENO	BEHAVIOR/CNS	10-28-05	14:30	P	IMPAIRED MOBILITY
				10-29-05	13:43	P	IMPAIRED MOBILITY
				10-30-05	13:36	P	IMPAIRED MOBILITY
				10-30-05	13:36	P	LYING ON SIDE; LIMBS EXTENDED
				10-30-05	13:36	P	HYPOACTIVITY
				10-31-05	15:00	P	IMPAIRED MOBILITY
				10-31-05	15:00	P	ROCKS, LURCHES, OR SWAYS AS IT WALKS
				11-02-05	15:27	P	IMPAIRED MOBILITY
				11-02-05	15:27	P	ROCKS, LURCHES, OR SWAYS AS IT WALKS
				11-02-05	15:27	P	HYPOACTIVITY
				11-03-05	14:19	P	IMPAIRED MOBILITY
				11-03-05	14:19	P	ROCKS, LURCHES, OR SWAYS AS IT WALKS
				11-03-05	14:19	P	HYPOACTIVITY
				11-04-05	14:23	P	IMPAIRED MOBILITY
				11-04-05	14:23	P	LYING ON SIDE; LIMBS EXTENDED
				11-04-05	14:23	P	HYPOACTIVITY
				11-05-05	13:47	P	IMPAIRED MOBILITY
				11-05-05	13:47	P	LYING ON SIDE; LIMBS EXTENDED
				11-05-05	13:47	P	HYPOACTIVITY
				11-06-05	14:56	P	IMPAIRED MOBILITY
				11-06-05	14:56	P	ROCKS, LURCHES, OR SWAYS AS IT WALKS
				11-06-05	14:56	P	HYPOACTIVITY
				11-07-05	14:46	P	IMPAIRED MOBILITY
				11-07-05	14:46	P	ROCKS, LURCHES, OR SWAYS AS IT WALKS
				11-07-05	14:46	P	HYPOACTIVITY
97182	M	100 MG PHENO	BEHAVIOR/CNS	10-25-05	13:38	P	IMPAIRED MOBILITY
				10-26-05	14:11	P	IMPAIRED MOBILITY
				10-26-05	14:11	P	LYING ON SIDE; LIMBS EXTENDED
				10-27-05	14:49	P	IMPAIRED MOBILITY

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

TABLE RANGE: 10-24-05 TO 11-09-05

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
97182	M	100 MG PHENO	BEHAVIOR/CNS	10-28-05	14:30	P	LYING ON SIDE; LIMBS EXTENDED
				10-29-05	13:44	P	IMPAIRED MOBILITY
				10-30-05	13:37	P	HYPOACTIVITY
				10-31-05	15:00	P	IMPAIRED MOBILITY
				10-31-05	15:00	P	ROCKS, LURCHES, OR SWAYS AS IT WALKS
				11-01-05	14:35	P	HYPOACTIVITY
				11-02-05	15:28	P	HYPOACTIVITY
				11-03-05	14:19	P	IMPAIRED MOBILITY
				11-03-05	14:19	P	ROCKS, LURCHES, OR SWAYS AS IT WALKS
				11-03-05	14:19	P	HYPOACTIVITY
				11-04-05	14:23	P	IMPAIRED MOBILITY
				11-04-05	14:23	P	ROCKS, LURCHES, OR SWAYS AS IT WALKS
				11-04-05	14:23	P	HYPOACTIVITY
				11-05-05	13:47	P	IMPAIRED MOBILITY
				11-05-05	13:47	P	ROCKS, LURCHES, OR SWAYS AS IT WALKS
				11-05-05	13:47	P	HYPOACTIVITY
				11-06-05	14:56	P	IMPAIRED MOBILITY
				11-06-05	14:56	P	ROCKS, LURCHES, OR SWAYS AS IT WALKS
				11-06-05	14:56	P	HYPOACTIVITY
				11-07-05	14:47	P	IMPAIRED MOBILITY
				11-07-05	14:47	P	ROCKS, LURCHES, OR SWAYS AS IT WALKS
				11-07-05	14:47	P	HYPOACTIVITY
97187	M	100 MG PHENO	BEHAVIOR/CNS	10-25-05	13:38	P	IMPAIRED MOBILITY
				10-26-05	14:11	P	IMPAIRED MOBILITY
				10-27-05	14:50	P	IMPAIRED MOBILITY
				10-27-05	14:50	P	LYING ON SIDE; LIMBS EXTENDED
				10-28-05	14:30	P	IMPAIRED MOBILITY
				10-29-05	13:45	P	IMPAIRED MOBILITY
				10-30-05	13:37	P	IMPAIRED MOBILITY

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

TABLE RANGE: 10-24-05 TO 11-09-05

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
97187	M	100 MG PHENO	BEHAVIOR/CNS	10-30-05	13:37	P	HYPOACTIVITY
				10-31-05	15:01	P	IMPAIRED MOBILITY
				10-31-05	15:01	P	ROCKS, LURCHES, OR SWAYS AS IT WALKS
				11-01-05	14:35	P	IMPAIRED MOBILITY
				11-02-05	15:29	P	HYPOACTIVITY
				11-03-05	14:20	P	IMPAIRED MOBILITY
				11-03-05	14:20	P	ROCKS, LURCHES, OR SWAYS AS IT WALKS
				11-03-05	14:20	P	HYPOACTIVITY
				11-04-05	14:24	P	IMPAIRED MOBILITY
				11-04-05	14:24	P	ROCKS, LURCHES, OR SWAYS AS IT WALKS
				11-04-05	14:24	P	HYPOACTIVITY
				11-05-05	13:47	P	IMPAIRED MOBILITY
				11-05-05	13:47	P	ROCKS, LURCHES, OR SWAYS AS IT WALKS
				11-05-05	13:47	P	HYPOACTIVITY
				11-06-05	14:57	P	IMPAIRED MOBILITY
				11-06-05	14:57	P	ROCKS, LURCHES, OR SWAYS AS IT WALKS
				11-06-05	14:57	P	HYPOACTIVITY
				11-07-05	14:48	P	IMPAIRED MOBILITY
				11-07-05	14:48	P	ROCKS, LURCHES, OR SWAYS AS IT WALKS
				11-07-05	14:48	P	HYPOACTIVITY
97191	M	100 MG PHENO	BEHAVIOR/CNS	10-26-05	14:12	P	IMPAIRED MOBILITY
				10-27-05	14:50	P	IMPAIRED MOBILITY
				10-27-05	14:50	P	LYING ON SIDE; LIMBS EXTENDED
				10-28-05	14:31	P	LYING ON SIDE; LIMBS EXTENDED
				10-29-05	13:45	P	IMPAIRED MOBILITY
				10-30-05	13:37	P	IMPAIRED MOBILITY
				10-30-05	13:37	P	HYPOACTIVITY
				10-31-05	15:01	P	IMPAIRED MOBILITY
				10-31-05	15:01	P	LYING ON SIDE; LIMBS EXTENDED

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

TABLE RANGE: 10-24-05 TO 11-09-05

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
97191	M	100 MG PHENO	BEHAVIOR/CNS	10-31-05	15:01	P	HYPOACTIVITY
				11-01-05	14:36	P	HYPOACTIVITY
				11-02-05	15:30	P	IMPAIRED MOBILITY
				11-02-05	15:30	P	ROCKS, LURCHES, OR SWAYS AS IT WALKS
				11-02-05	15:30	P	HYPOACTIVITY
				11-03-05	14:21	P	IMPAIRED MOBILITY
				11-03-05	14:21	P	LYING ON SIDE; LIMBS EXTENDED
				11-03-05	14:21	P	HYPOACTIVITY
				11-04-05	14:24	P	IMPAIRED MOBILITY
				11-04-05	14:24	P	ROCKS, LURCHES, OR SWAYS AS IT WALKS
				11-04-05	14:24	P	HYPOACTIVITY
				11-07-05	14:48	P	IMPAIRED MOBILITY
				11-07-05	14:48	P	ROCKS, LURCHES, OR SWAYS AS IT WALKS
				11-07-05	14:48	P	HYPOACTIVITY
				11-08-05	14:12	P	IMPAIRED MOBILITY
				11-08-05	14:12	P	ROCKS, LURCHES, OR SWAYS AS IT WALKS
				11-08-05	14:12	P	HYPOACTIVITY
97194	M	100 MG PHENO	BEHAVIOR/CNS	10-26-05	14:12	P	IMPAIRED MOBILITY
				10-27-05	14:51	P	IMPAIRED MOBILITY
				10-27-05	14:51	P	LYING ON SIDE; LIMBS EXTENDED
				10-28-05	14:31	P	LYING ON SIDE; LIMBS EXTENDED
				10-29-05	13:45	P	IMPAIRED MOBILITY
				10-29-05	13:45	P	LYING ON SIDE; LIMBS EXTENDED
				10-29-05	13:46	P	HYPOACTIVITY
				10-30-05	13:38	P	IMPAIRED MOBILITY
				10-30-05	13:38	P	LYING ON SIDE; LIMBS EXTENDED
				10-30-05	13:38	P	HYPOACTIVITY
				10-31-05	15:01	P	IMPAIRED MOBILITY
				10-31-05	15:01	P	ROCKS, LURCHES, OR SWAYS AS IT WALKS

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

TABLE RANGE: 10-24-05 TO 11-09-05

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
97194	M	100 MG PHENO	BEHAVIOR/CNS	11-01-05	14:36	P	IMPAIRED MOBILITY
				11-01-05	14:36	P	ROCKS, LURCHES, OR SWAYS AS IT WALKS
				11-01-05	14:36	P	HYPOACTIVITY
				11-02-05	15:31	P	IMPAIRED MOBILITY
				11-02-05	15:31	P	ROCKS, LURCHES, OR SWAYS AS IT WALKS
				11-02-05	15:31	P	HYPOACTIVITY
				11-03-05	14:21	P	IMPAIRED MOBILITY
				11-03-05	14:21	P	ROCKS, LURCHES, OR SWAYS AS IT WALKS
				11-03-05	14:21	P	HYPOACTIVITY
				11-04-05	14:24	P	IMPAIRED MOBILITY
				11-04-05	14:24	P	LYING ON SIDE; LIMBS EXTENDED
				11-04-05	14:24	P	HYPOACTIVITY
				11-05-05	13:48	P	IMPAIRED MOBILITY
				11-05-05	13:48	P	ROCKS, LURCHES, OR SWAYS AS IT WALKS
				11-05-05	13:48	P	HYPOACTIVITY
				11-06-05	14:58	P	IMPAIRED MOBILITY
				11-06-05	14:58	P	ROCKS, LURCHES, OR SWAYS AS IT WALKS
				11-06-05	14:58	P	HYPOACTIVITY
				11-07-05	14:49	P	IMPAIRED MOBILITY
				11-07-05	14:49	P	ROCKS, LURCHES, OR SWAYS AS IT WALKS
				11-07-05	14:49	P	HYPOACTIVITY
				11-08-05	14:12	P	IMPAIRED MOBILITY
				11-08-05	14:12	P	ROCKS, LURCHES, OR SWAYS AS IT WALKS
				11-08-05	14:12	P	HYPOACTIVITY
97194	M	100 MG PHENO	BODY/INTEGUMENT	10-31-05	15:02	1	DRIED YELLOW MATERIAL UROGENITAL AREA
97209	M	100 MG PHENO	BEHAVIOR/CNS	10-26-05	14:12	P	IMPAIRED MOBILITY
				10-27-05	14:51	P	IMPAIRED MOBILITY
				10-28-05	14:32	P	IMPAIRED MOBILITY
				10-29-05	13:46	P	IMPAIRED MOBILITY

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

TABLE RANGE: 10-24-05 TO 11-09-05

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
97209	M	100 MG PHENO	BEHAVIOR/CNS	10-30-05	13:38	P	IMPAIRED MOBILITY
				10-30-05	13:38	P	HYPOACTIVITY
				10-31-05	15:02	P	IMPAIRED MOBILITY
				10-31-05	15:02	P	ROCKS, LURCHES, OR SWAYS AS IT WALKS
				11-01-05	14:37	P	HYPOACTIVITY
				11-02-05	15:31	P	IMPAIRED MOBILITY
				11-02-05	15:31	P	ROCKS, LURCHES, OR SWAYS AS IT WALKS
				11-02-05	15:31	P	HYPOACTIVITY
				11-03-05	14:21	P	IMPAIRED MOBILITY
				11-03-05	14:21	P	LYING ON SIDE; LIMBS EXTENDED
				11-03-05	14:21	P	HYPOACTIVITY
				11-04-05	14:25	P	IMPAIRED MOBILITY
				11-04-05	14:25	P	ROCKS, LURCHES, OR SWAYS AS IT WALKS
				11-04-05	14:25	P	HYPOACTIVITY
				11-06-05	14:58	P	IMPAIRED MOBILITY
				11-06-05	14:58	P	ROCKS, LURCHES, OR SWAYS AS IT WALKS
				11-06-05	14:58	P	HYPOACTIVITY
				11-07-05	14:50	P	IMPAIRED MOBILITY
				11-07-05	14:50	P	ROCKS, LURCHES, OR SWAYS AS IT WALKS
				11-07-05	14:50	P	HYPOACTIVITY
				11-08-05	14:13	P	IMPAIRED MOBILITY
				11-08-05	14:13	P	ROCKS, LURCHES, OR SWAYS AS IT WALKS
				11-08-05	14:13	P	HYPOACTIVITY
97216	M	100 MG PHENO	BEHAVIOR/CNS	10-26-05	14:13	P	IMPAIRED MOBILITY
				10-27-05	14:52	P	IMPAIRED MOBILITY
				10-27-05	14:52	P	LYING ON SIDE; LIMBS EXTENDED
				10-28-05	14:32	P	LYING ON SIDE; LIMBS EXTENDED
				10-29-05	13:46	P	IMPAIRED MOBILITY
				10-30-05	13:38	P	IMPAIRED MOBILITY

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

TABLE RANGE: 10-24-05 TO 11-09-05

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
97216	M	100 MG PHENO	BEHAVIOR/CNS	10-30-05	13:38	P	LYING ON SIDE; LIMBS EXTENDED
				10-30-05	13:38	P	HYPOACTIVITY
				10-31-05	15:02	P	IMPAIRED MOBILITY
				10-31-05	15:02	P	ROCKS, LURCHES, OR SWAYS AS IT WALKS
				11-01-05	14:38	P	HYPOACTIVITY
				11-02-05	15:32	P	HYPOACTIVITY
				11-03-05	14:22	P	IMPAIRED MOBILITY
				11-03-05	14:22	P	ROCKS, LURCHES, OR SWAYS AS IT WALKS
				11-03-05	14:22	P	HYPOACTIVITY
				11-04-05	14:25	P	IMPAIRED MOBILITY
				11-04-05	14:25	P	LYING ON SIDE; LIMBS EXTENDED
				11-04-05	14:25	P	HYPOACTIVITY
				11-05-05	13:49	P	IMPAIRED MOBILITY
				11-05-05	13:49	P	ROCKS, LURCHES, OR SWAYS AS IT WALKS
				11-05-05	13:49	P	HYPOACTIVITY
				11-06-05	14:59	P	IMPAIRED MOBILITY
				11-06-05	14:59	P	LYING ON SIDE; LIMBS EXTENDED
				11-06-05	14:59	P	HYPOACTIVITY
				11-07-05	14:50	P	IMPAIRED MOBILITY
				11-07-05	14:50	P	ROCKS, LURCHES, OR SWAYS AS IT WALKS
				11-07-05	14:50	P	HYPOACTIVITY
				11-08-05	14:14	P	IMPAIRED MOBILITY
				11-08-05	14:14	P	ROCKS, LURCHES, OR SWAYS AS IT WALKS
				11-08-05	14:14	P	HYPOACTIVITY
97224	M	100 MG PHENO	BEHAVIOR/CNS	10-26-05	14:13	P	IMPAIRED MOBILITY
				10-27-05	14:52	P	IMPAIRED MOBILITY
				10-28-05	14:34	P	IMPAIRED MOBILITY
				10-29-05	13:47	P	IMPAIRED MOBILITY
				10-29-05	13:47	P	LYING ON SIDE; LIMBS EXTENDED

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

ANIMAL	SEX	GROUP	CATEGORY	DATE	TIME	GRADE	OBSERVATIONS
97224	M	100 MG PHENO	BEHAVIOR/CNS	10-30-05	13:38	P	IMPAIRED MOBILITY
				10-30-05	13:39	P	HYPOACTIVITY
				10-31-05	15:03	P	IMPAIRED MOBILITY
				10-31-05	15:03	P	LYING ON SIDE; LIMBS EXTENDED
				10-31-05	15:03	P	HYPOACTIVITY
				11-01-05	14:38	P	IMPAIRED MOBILITY
				11-01-05	14:38	P	LYING ON SIDE; LIMBS EXTENDED
				11-01-05	14:38	P	HYPOACTIVITY
				11-02-05	15:33	P	IMPAIRED MOBILITY
				11-02-05	15:33	P	ROCKS, LURCHES, OR SWAYS AS IT WALKS
				11-02-05	15:33	P	HYPOACTIVITY
				11-03-05	14:22	P	IMPAIRED MOBILITY
				11-03-05	14:22	P	LYING ON SIDE; LIMBS EXTENDED
				11-03-05	14:22	P	HYPOACTIVITY
				11-04-05	14:25	P	IMPAIRED MOBILITY
				11-04-05	14:25	P	ROCKS, LURCHES, OR SWAYS AS IT WALKS
				11-04-05	14:25	P	HYPOACTIVITY
				11-05-05	13:50	P	IMPAIRED MOBILITY
				11-05-05	13:50	P	ROCKS, LURCHES, OR SWAYS AS IT WALKS
				11-05-05	13:50	P	HYPOACTIVITY
				11-06-05	15:00	P	IMPAIRED MOBILITY
				11-06-05	15:00	P	LYING ON SIDE; LIMBS EXTENDED
				11-06-05	15:00	P	HYPOACTIVITY
				11-07-05	14:51	P	IMPAIRED MOBILITY
				11-07-05	14:51	P	LYING ON SIDE; LIMBS EXTENDED
				11-07-05	14:51	P	HYPOACTIVITY
				11-08-05	14:14	P	IMPAIRED MOBILITY
				11-08-05	14:14	P	ROCKS, LURCHES, OR SWAYS AS IT WALKS
				11-08-05	14:14	P	HYPOACTIVITY

GRADE CODE: 1 - SLIGHT 2 - MODERATE 3 - SEVERE P - PRESENT

SPONSOR:BATTELLE INDIVIDUAL BODY WEIGHTS [G]
SPONSOR NO.:68-W-01-023

MALES

DAY	1	2	3	4	5	6	7	8	9	10	11	12
ANIMALS FROM GROUP 1: METHYLCELLULOSE												
97126	309.	317.	318.	323.	328.	332.	335.	342.	346.	351.	351.	356.
97136	330.	337.	339.	344.	350.	351.	348.	358.	362.	365.	371.	374.
97157	324.	320.	332.	335.	337.	350.	350.	360.	361.	371.	370.	377.
97159	341.	347.	346.	352.	361.	367.	373.	381.	390.	388.	397.	395.
97168	310.	311.	309.	313.	315.	316.	318.	319.	322.	317.	320.	321.
97172	328.	334.	340.	345.	352.	350.	360.	359.	363.	372.	378.	383.
97192	349.	355.	359.	364.	373.	378.	381.	390.	391.	397.	402.	404.
97198	339.	346.	346.	354.	357.	360.	362.	366.	363.	374.	375.	375.
97200	339.	346.	349.	354.	357.	359.	368.	372.	373.	378.	382.	384.
97205	325.	327.	338.	339.	342.	344.	350.	352.	353.	358.	363.	371.
97212	345.	362.	367.	377.	381.	385.	387.	396.	405.	407.	418.	422.
97213	332.	336.	337.	345.	347.	353.	359.	360.	365.	369.	374.	379.
97226	344.	351.	355.	357.	363.	367.	375.	376.	381.	383.	387.	393.
97227	344.	348.	352.	359.	360.	365.	371.	371.	379.	382.	387.	391.
97237	327.	334.	341.	337.	349.	352.	355.	359.	367.	368.	373.	376.
MEAN	332.	338.	342.	347.	351.	355.	359.	364.	368.	372.	376.	380.
S.D.	12.2	14.7	14.9	16.1	16.8	17.1	18.0	18.8	20.2	20.9	22.6	22.6
N	15	15	15	15	15	15	15	15	15	15	15	15

MALES

DAY	13	14	15
ANIMALS FROM GROUP 1: METHYLCELLULOSE			
97126	358.	357.	361.
97136	380.	382.	384.
97157	383.	386.	393.
97159	403.	405.	410.
97168	323.	324.	328.
97172	384.	381.	380.
97192	407.	407.	415.
97198	382.	382.	382.
97200	390.	388.	391.
97205	373.	375.	380.
97212	420.	426.	433.
97213	382.	386.	392.
97226	392.	394.	397.
97227	392.	393.	398.
97237	374.	380.	381.
MEAN	383.	384.	388.
S.D.	22.3	22.9	23.9
N	15	15	15

MALES

DAY	1	2	3	4	5	6	7	8	9	10	11	12
ANIMALS FROM GROUP 2: 50 MG LINURON												
97122	342.	335.	328.	326.	332.	346.	340.	333.	341.	339.	346.	346.
97124	314.	317.	306.	309.	306.	328.	312.	313.	317.	316.	321.	323.
97125	322.	316.	318.	319.	322.	342.	320.	321.	318.	325.	327.	329.
97137	313.	305.	301.	301.	304.	334.	315.	318.	316.	319.	322.	325.
97138	330.	317.	310.	304.	309.	326.	309.	313.	318.	325.	330.	335.
97165	335.	320.	318.	304.	319.	326.	324.	325.	337.	329.	330.	337.
97176	329.	318.	306.	314.	305.	320.	308.	305.	291.	310.	305.	314.
97189	317.	312.	308.	313.	316.	320.	329.	330.	320.	340.	347.	355.
97197	318.	303.	307.	307.	307.	305.	310.	310.	313.	314.	311.	314.
97199	342.	327.	319.	314.	326.	335.	328.	332.	357.	349.	358.	367.
97206	347.	345.	344.	347.	350.	357.	353.	357.	357.	363.	364.	368.
97210	353.	333.	324.	327.	329.	330.	325.	321.	321.	324.	320.	336.
97217	346.	344.	338.	341.	338.	346.	339.	338.	332.	345.	345.	351.
97221	342.	337.	332.	343.	339.	345.	344.	343.	352.	355.	363.	363.
97236	336.	327.	331.	333.	335.	336.	334.	327.	339.	339.	345.	348.
MEAN	333.	324.	319.	320.	322.	333.	326.	326.	328.	333.	335.	341.
S.D.	13.1	13.0	13.3	15.2	14.5	13.0	13.9	13.7	18.6	15.8	18.5	17.8
N	15	15	15	15	15	15	15	15	15	15	15	15

MALES

DAY	13	14	15
ANIMALS FROM GROUP 2: 50 MG LINURON			
97122	353.	355.	359.
97124	322.	325.	327.
97125	329.	335.	328.
97137	331.	334.	337.
97138	338.	346.	343.
97165	340.	344.	347.
97176	321.	324.	321.
97189	358.	358.	366.
97197	319.	314.	318.
97199	376.	382.	385.
97206	364.	369.	370.
97210	324.	333.	348.
97217	350.	353.	357.
97221	367.	376.	381.
97236	343.	346.	349.
MEAN	342.	346.	349.
S.D.	18.3	19.7	20.8
N	15	15	15

MALES

DAY	1	2	3	4	5	6	7	8	9	10	11	12
ANIMALS FROM GROUP 3: 100 MG LINURON												
97119	321.	306.	296.	291.	259.	278.	298.	296.	285.	286.	295.	294.
97132	319.	305.	287.	285.	259.	270.	280.	279.	268.	262.	270.	270.
97148	317.	308.	302.	290.	294.	298.	292.	280.	283.	305.	295.	296.
97150	330.	319.	323.	318.	287.	320.	311.	327.	323.	329.	332.	332.
97152	319.	295.	295.	287.	291.	268.	274.	293.	290.	293.	288.	287.
97163	342.	317.	327.	338.	308.	295.	277.	264.	284.	272.	251.	259.
97166	327.	300.	299.	298.	293.	298.	303.	314.	319.	319.	321.	326.
97167	347.	334.	334.	350.	330.	339.	348.	348.	348.	336.	343.	350.
97170	345.	330.	322.	297.	310.	314.	316.	312.	319.	324.	325.	331.
97181	318.	304.	281.	305.	262.	297.	288.	288.	274.	290.	288.	286.
97184	347.	324.	314.	316.	316.	329.	332.	318.	315.	321.	319.	333.
97185	333.	322.	308.	300.	306.	309.	308.	316.	312.	313.	321.	324.
97188	337.	325.	330.	314.	326.	324.	324.	323.	316.	316.	327.	330.
97193	344.	326.	339.	308.	307.	309.	311.	311.	312.	313.	320.	311.
97238	336.	325.	333.	305.	312.	312.	319.	321.	320.	324.	326.	333.
MEAN	332.	316.	313.	307.	297.	304.	305.	306.	305.	307.	308.	311.
S.D.	11.4	12.0	18.7	18.4	22.7	20.7	21.0	22.0	22.4	21.6	25.7	26.8
N	15	15	15	15	15	15	15	15	15	15	15	15

MALES

DAY	13	14	15
ANIMALS FROM GROUP 3: 100 MG LINURON			
97119	292.	294.	297.
97132	268.	282.	284.
97148	296.	300.	306.
97150	341.	347.	349.
97152	292.	304.	301.
97163	282.	279.	278.
97166	324.	331.	337.
97167	358.	352.	358.
97170	336.	337.	346.
97181	281.	288.	307.
97184	323.	329.	332.
97185	326.	328.	335.
97188	329.	337.	338.
97193	317.	322.	322.
97238	330.	339.	337.
MEAN	313.	318.	322.
S.D.	26.0	24.5	24.6
N	15	15	15

MALES

DAY	1	2	3	4	5	6	7	8	9	10	11	12
ANIMALS FROM GROUP 4: 150 MG LINURON												
97128	317.	304.	289.	291.	320.	298.	307.	293.	293.	291.	290.	290.
97140	319.	309.	297.	300.	325.	302.	301.	302.	301.	302.	304.	309.
97142	321.	309.	304.	298.	295.	309.	316.	320.	309.	309.	318.	320.
97144	327.	320.	315.	312.	310.	316.	315.	318.	310.	305.	307.	306.
97161	340.	323.	302.	285.	272.	289.	297.	295.	287.	291.	295.	296.
97162	286.	277.	272.	252.	259.	278.	285.	293.	277.	268.	260.	251.
97171	331.	310.	302.	301.	308.	312.	312.	305.	301.	303.	308.	314.
97174	330.	313.	296.	292.	291.	294.	292.	291.	293.	292.	294.	297.
97207	341.	312.	293.	280.	276.	288.	303.	300.	297.	301.	297.	301.
97211	323.	298.	281.	282.	287.	290.	285.	283.	288.	288.	293.	287.
97214	320.	298.	304.	286.	284.	283.	276.	272.	276.	272.	280.	277.
97222	334.	308.	321.	296.	298.	305.	309.	307.	307.	297.	299.	304.
97223	359.	325.	348.	305.	287.							
97225	350.	336.	334.	306.	306.	325.	323.	324.	318.	319.	319.	330.
97231	351.	319.	293.	293.	292.	294.	285.	283.	300.	296.	294.	311.
MEAN	330.	311.	303.	292.	294.	299.	301.	299.	297.	295.	297.	299.
S.D.	17.7	13.8	19.5	14.4	17.9	13.4	14.1	15.0	12.3	13.5	15.0	19.5
N	15	15	15	15	15	14	14	14	14	14	14	14

MALES

DAY	13	14	15
ANIMALS FROM GROUP 4: 150 MG LINURON			
97128	297.	304.	299.
97140	305.	308.	311.
97142	317.	321.	323.
97144	310.	309.	312.
97161	297.	301.	299.
97162	285.	296.	300.
97171	315.	309.	312.
97174	303.	303.	307.
97207	314.	310.	324.
97211	298.	288.	298.
97214	273.	273.	290.
97222	312.	316.	309.
97225	333.	336.	339.
97231	306.	290.	303.
MEAN	305.	305.	309.
S.D.	14.6	15.4	12.8
N	14	14	14

MALES

DAY	1	2	3	4	5	6	7	8	9	10	11	12
ANIMALS FROM GROUP 5: 25 MG PHENO												
97121	323.	333.	334.	338.	322.	336.	338.	340.	347.	349.	356.	360.
97127	344.	358.	362.	372.	379.	389.	394.	405.	408.	414.	418.	424.
97131	319.	328.	333.	334.	338.	345.	352.	359.	360.	364.	365.	368.
97133	338.	348.	358.	360.	369.	377.	386.	389.	392.	399.	404.	406.
97134	320.	334.	337.	343.	346.	344.	347.	354.	361.	368.	372.	378.
97141	334.	342.	348.	348.	350.	356.	357.	358.	362.	364.	367.	373.
97143	330.	335.	339.	347.	349.	353.	354.	351.	363.	361.	359.	366.
97151	332.	346.	349.	358.	360.	368.	366.	373.	377.	384.	381.	387.
97155	311.	320.	316.	318.	319.	319.	317.	323.	324.	326.	326.	327.
97173	341.	355.	361.	367.	375.	379.	385.	389.	392.	400.	406.	412.
97180	338.	351.	359.	359.	363.	366.	366.	365.	374.	374.	382.	385.
97186	316.	327.	327.	326.	327.	329.	329.	330.	338.	339.	346.	349.
97218	357.	369.	372.	373.	377.	381.	382.	385.	389.	392.	397.	401.
97233	342.	350.	356.	362.	359.	365.	371.	372.	376.	382.	382.	389.
97235	318.	325.	329.	329.	328.	328.	335.	336.	339.	343.	344.	349.
MEAN	331.	341.	345.	349.	351.	356.	359.	362.	367.	371.	374.	378.
S.D.	12.9	13.9	16.1	17.3	20.4	21.7	22.9	24.0	23.4	24.9	25.8	26.2
N	15	15	15	15	15	15	15	15	15	15	15	15

MALES

DAY	13	14	15
ANIMALS FROM GROUP 5: 25 MG PHENO			
97121	366.	373.	374.
97127	430.	436.	445.
97131	374.	372.	377.
97133	411.	415.	420.
97134	384.	388.	392.
97141	376.	371.	379.
97143	367.	365.	364.
97151	394.	393.	400.
97155	329.	326.	330.
97173	414.	418.	421.
97180	381.	382.	391.
97186	346.	350.	354.
97218	398.	399.	409.
97233	394.	395.	398.
97235	347.	349.	356.
MEAN	381.	382.	387.
S.D.	27.5	28.9	30.0
N	15	15	15

MALES

DAY	1	2	3	4	5	6	7	8	9	10	11	12
ANIMALS FROM GROUP 6: 50 MG PHENO												
97123	321.	332.	338.	338.	347.	349.	353.	358.	355.	355.	367.	367.
97129	342.	351.	354.	356.	358.	358.	366.	366.	361.	367.	373.	370.
97135	324.	342.	347.	349.	354.	353.	356.	359.	366.	367.	373.	375.
97139	322.	334.	339.	343.	348.	348.	354.	356.	357.	362.	364.	368.
97146	329.	343.	349.	356.	360.	359.	364.	366.	374.	376.	382.	388.
97149	339.	346.	349.	356.	362.	362.	366.	370.	375.	379.	379.	382.
97183	335.	344.	348.	355.	358.	357.	358.	354.	361.	364.	362.	363.
97190	344.	351.	362.	374.	374.	376.	385.	393.	395.	406.	408.	412.
97195	327.	323.	325.	327.	330.	334.	337.	338.	341.	343.	346.	347.
97203	348.	363.	364.	375.	375.	381.	382.	382.	379.	386.	389.	391.
97215	327.	336.	340.	344.	348.	353.	360.	362.	367.	372.	380.	386.
97228	319.	335.	336.	337.	339.	339.	341.	338.	341.	342.	344.	348.
97229	320.	332.	334.	333.	328.	332.	333.	330.	335.	339.	337.	340.
97230	332.	339.	348.	351.	349.	351.	351.	350.	349.	348.	350.	350.
97232	326.	333.	341.	347.	350.	354.	356.	353.	356.	361.	365.	367.
MEAN	330.	340.	345.	349.	352.	354.	357.	358.	361.	364.	368.	370.
S.D.	9.4	9.9	10.3	13.5	13.5	13.3	14.5	16.5	16.0	18.1	18.9	19.6
N	15	15	15	15	15	15	15	15	15	15	15	15

MALES

DAY	13	14	15
ANIMALS FROM GROUP 6: 50 MG PHENO			
97123	372.	373.	374.
97129	372.	374.	376.
97135	379.	384.	386.
97139	370.	373.	376.
97146	389.	393.	400.
97149	387.	385.	391.
97183	368.	370.	373.
97190	417.	418.	424.
97195	351.	354.	356.
97203	395.	397.	403.
97215	390.	396.	403.
97228	348.	351.	357.
97229	343.	345.	349.
97230	354.	360.	365.
97232	369.	373.	377.
MEAN	374.	376.	381.
S.D.	19.9	19.5	20.6
N	15	15	15

MALES

DAY	1	2	3	4	5	6	7	8	9	10	11	12
ANIMALS FROM GROUP 7: 100 MG PHENO												
97120	325.	331.	323.	328.	329.	332.	334.	334.	336.	333.	336.	337.
97130	326.	325.	308.	313.	324.	331.	337.	339.	337.	340.	348.	351.
97145	317.	319.	294.	285.	295.	301.	305.	308.	313.	311.	308.	315.
97154	330.	330.	326.	333.	343.	349.	347.	351.	354.	357.	362.	365.
97158	327.	330.	316.	324.	325.	325.	330.	329.	331.	333.	335.	339.
97160	321.	320.	310.	315.	317.	329.	332.	333.	335.	344.	342.	345.
97175	329.	331.	291.	NA								
97177	341.	348.	336.	338.	347.	350.	350.	351.	357.	364.	370.	372.
97182	318.	312.	307.	316.	319.	319.	324.	327.	328.	335.	338.	340.
97187	346.	349.	353.	360.	374.	374.	378.	382.	381.	389.	394.	401.
97191	323.	323.	310.	301.	314.	322.	335.	338.	348.	352.	355.	359.
97194	338.	330.	306.	299.	295.	304.	317.	330.	337.	343.	356.	357.
97209	339.	342.	336.	331.	333.	337.	339.	337.	343.	343.	345.	349.
97216	351.	371.	366.	372.	372.	367.	370.	365.	380.	385.	388.	394.
97224	359.	348.	347.	351.	354.	366.	371.	370.	374.	383.	385.	393.
MEAN	333.	334.	322.	326.	331.	336.	341.	342.	347.	351.	354.	358.
S.D.	12.7	15.2	21.9	24.2	24.6	22.6	20.8	19.5	20.4	22.6	23.8	24.6
N	15	15	15	14	14	14	14	14	14	14	14	14

NA = NOT APPLICABLE

MALES

DAY	13	14	15
ANIMALS FROM GROUP 7: 100 MG PHENO			
97120	342.	345.	350.
97130	356.	361.	365.
97145	321.	325.	330.
97154	369.	375.	361.
97158	341.	343.	349.
97160	351.	354.	357.
97177	374.	379.	385.
97182	339.	340.	347.
97187	404.	410.	415.
97191	363.	365.	374.
97194	357.	359.	366.
97209	351.	354.	354.
97216	393.	398.	406.
97224	400.	405.	410.
MEAN	361.	365.	369.
S.D.	24.4	25.5	25.8
N	14	14	14

MALES

DAY	1- 2	2- 3	3- 4	4- 5	5- 6	6- 7	7- 8	8- 9	9- 10	10- 11	11- 12	12- 13
ANIMALS FROM GROUP 1: METHYLCELLULOSE												
97126	8.	2.	4.	5.	5.	3.	7.	4.	5.	0.	6.	2.
97136	7.	2.	5.	6.	1.	-3.	10.	4.	3.	7.	3.	6.
97157	-4.	12.	3.	3.	13.	0.	10.	1.	10.	-1.	7.	6.
97159	6.	0.	6.	9.	6.	6.	8.	9.	-2.	8.	-2.	8.
97168	1.	-2.	4.	2.	1.	2.	1.	3.	-4.	3.	1.	2.
97172	7.	6.	5.	7.	-2.	9.	0.	4.	9.	6.	5.	2.
97192	6.	4.	5.	9.	5.	3.	9.	1.	6.	5.	3.	2.
97198	7.	1.	8.	3.	3.	2.	4.	-3.	10.	1.	1.	7.
97200	7.	3.	5.	3.	2.	9.	4.	2.	4.	4.	2.	6.
97205	2.	11.	1.	3.	2.	6.	2.	0.	5.	5.	8.	2.
97212	17.	5.	10.	4.	4.	2.	8.	9.	3.	10.	4.	-2.
97213	5.	1.	8.	2.	6.	6.	1.	5.	4.	6.	4.	3.
97226	7.	4.	2.	6.	4.	8.	1.	6.	2.	4.	5.	-1.
97227	4.	4.	7.	1.	5.	6.	0.	8.	3.	5.	4.	1.
97237	7.	6.	-4.	12.	3.	3.	5.	7.	1.	5.	3.	-2.
MEAN	6.	4.	5.	5.	4.	4.	4.	4.	4.	4.	4.	3.
S.D.	4.4	3.9	3.2	3.2	3.3	3.4	3.8	3.4	4.0	3.0	2.5	3.1
N	15	15	15	15	15	15	15	15	15	15	15	15

MALES

DAY	13- 14	14- 15	1- 8	8- 15	1- 15
ANIMALS FROM GROUP 1: METHYLCELLULOSE					
97126	-1.	4.	33.	19.	52.
97136	2.	2.	27.	26.	54.
97157	3.	7.	37.	33.	69.
97159	1.	5.	40.	29.	70.
97168	2.	4.	9.	9.	18.
97172	-4.	-1.	32.	21.	53.
97192	0.	8.	40.	26.	66.
97198	0.	1.	27.	16.	43.
97200	-1.	3.	33.	19.	52.
97205	2.	5.	27.	28.	55.
97212	6.	7.	50.	38.	88.
97213	4.	6.	28.	33.	61.
97226	2.	3.	32.	21.	53.
97227	1.	5.	28.	27.	55.
97237	6.	1.	32.	22.	54.
MEAN	2.	4.	32.	24.	56.
S.D.	2.6	2.6	9.0	7.3	15.0
N	15	15	15	15	15

MALES

DAY	1- 2	2- 3	3- 4	4- 5	5- 6	6- 7	7- 8	8- 9	9- 10	10- 11	11- 12	12- 13
ANIMALS FROM GROUP 2: 50 MG LINURON												
97122	-8.	-6.	-3.	6.	15.	-6.	-7.	8.	-2.	7.	0.	7.
97124	3.	-11.	3.	-3.	22.	-16.	1.	4.	-1.	5.	2.	-1.
97125	-6.	2.	1.	3.	20.	-22.	2.	-4.	7.	1.	3.	-1.
97137	-8.	-5.	0.	4.	29.	-19.	3.	-2.	3.	4.	3.	6.
97138	-13.	-7.	-6.	5.	17.	-18.	5.	5.	7.	5.	5.	3.
97165	-15.	-3.	-13.	14.	7.	-1.	0.	13.	-8.	1.	7.	3.
97176	-11.	-12.	8.	-9.	16.	-12.	-3.	-15.	20.	-6.	10.	7.
97189	-5.	-3.	5.	3.	4.	9.	1.	-9.	20.	6.	8.	3.
97197	-16.	4.	0.	0.	-2.	5.	0.	3.	1.	-3.	3.	5.
97199	-14.	-8.	-5.	11.	9.	-7.	4.	25.	-8.	9.	8.	9.
97206	-2.	0.	2.	3.	7.	-4.	4.	0.	5.	2.	4.	-5.
97210	-20.	-9.	3.	2.	0.	-5.	-4.	0.	3.	-3.	16.	-13.
97217	-2.	-6.	3.	-3.	8.	-7.	-1.	-7.	14.	-1.	6.	0.
97221	-5.	-5.	11.	-4.	5.	0.	-2.	10.	2.	8.	0.	5.
97236	-10.	5.	2.	1.	1.	-2.	-6.	11.	0.	6.	3.	-5.
MEAN	-9.	-4.	1.	2.	11.	-7.	0.	3.	4.	3.	5.	2.
S.D.	6.1	5.2	5.8	5.9	8.9	8.9	3.7	9.8	8.4	4.4	4.2	5.7
N	15	15	15	15	15	15	15	15	15	15	15	15

MALES

DAY	13- 14	14- 15	1- 8	8- 15	1- 15
ANIMALS FROM GROUP 2: 50 MG LINURON					
97122	3.	4.	-10.	26.	17.
97124	3.	2.	-1.	14.	13.
97125	6.	-7.	0.	7.	6.
97137	3.	3.	4.	19.	24.
97138	8.	-3.	-17.	30.	13.
97165	4.	3.	-11.	23.	12.
97176	3.	-3.	-24.	16.	-8.
97189	1.	8.	13.	37.	49.
97197	-5.	4.	-8.	8.	0.
97199	6.	3.	-10.	53.	43.
97206	5.	1.	10.	13.	23.
97210	9.	16.	-32.	27.	-5.
97217	3.	4.	-8.	19.	11.
97221	9.	5.	0.	38.	39.
97236	4.	3.	-9.	22.	13.
MEAN	4.	3.	-7.	23.	17.
S.D.	3.5	5.0	12.0	12.4	16.8
N	15	15	15	15	15

MALES

DAY	1- 2	2- 3	3- 4	4- 5	5- 6	6- 7	7- 8	8- 9	9- 10	10- 11	11- 12	12- 13
ANIMALS FROM GROUP 3: 100 MG LINURON												
97119	-14.	-11.	-5.	-32.	19.	20.	-3.	-10.	1.	8.	0.	-3.
97132	-14.	-18.	-2.	-25.	11.	10.	-1.	-11.	-6.	8.	0.	-3.
97148	-9.	-6.	-12.	4.	5.	-7.	-12.	3.	21.	-10.	2.	0.
97150	-11.	5.	-6.	-30.	33.	-10.	16.	-4.	6.	3.	-1.	9.
97152	-24.	0.	-9.	4.	-23.	6.	19.	-3.	3.	-5.	-1.	5.
97163	-25.	10.	11.	-30.	-14.	-18.	-13.	19.	-11.	-21.	8.	23.
97166	-27.	-1.	-1.	-5.	5.	6.	11.	5.	0.	2.	4.	-2.
97167	-13.	0.	16.	-20.	9.	10.	-1.	1.	-12.	7.	6.	8.
97170	-15.	-8.	-25.	13.	4.	3.	-4.	7.	5.	2.	5.	5.
97181	-13.	-24.	24.	-43.	35.	-8.	0.	-14.	16.	-3.	-2.	-5.
97184	-23.	-10.	2.	0.	13.	3.	-13.	-3.	6.	-2.	14.	-10.
97185	-11.	-14.	-8.	6.	3.	-2.	8.	-4.	1.	9.	2.	2.
97188	-12.	5.	-16.	12.	-2.	0.	0.	-8.	0.	11.	3.	-1.
97193	-18.	13.	-31.	-2.	2.	2.	0.	1.	0.	7.	-9.	6.
97238	-10.	8.	-28.	7.	-1.	8.	2.	-1.	4.	2.	7.	-3.
MEAN	-16.	-3.	-6.	-9.	7.	1.	1.	-1.	2.	1.	3.	2.
S.D.	5.8	10.7	15.6	18.5	14.9	9.4	9.6	8.3	8.7	8.5	5.2	7.7
N	15	15	15	15	15	15	15	15	15	15	15	15

MALES

DAY	13- 14	14- 15	1- 8	8- 15	1- 15
ANIMALS FROM GROUP 3: 100 MG LINURON					
97119	2.	3.	-25.	2.	-24.
97132	14.	2.	-40.	5.	-35.
97148	3.	7.	-37.	26.	-11.
97150	6.	2.	-3.	22.	19.
97152	12.	-3.	-27.	8.	-18.
97163	-3.	-1.	-78.	14.	-64.
97166	6.	6.	-12.	23.	10.
97167	-6.	6.	0.	11.	11.
97170	1.	9.	-33.	34.	1.
97181	7.	19.	-29.	19.	-11.
97184	6.	3.	-29.	14.	-15.
97185	2.	8.	-17.	19.	3.
97188	8.	1.	-14.	15.	1.
97193	6.	0.	-33.	11.	-22.
97238	10.	-2.	-15.	16.	2.
MEAN	5.	4.	-26.	16.	-10.
S.D.	5.2	5.5	18.6	8.4	21.0
N	15	15	15	15	15

MALES

DAY	1- 2	2- 3	3- 4	4- 5	5- 6	6- 7	7- 8	8- 9	9- 10	10- 11	11- 12	12- 13
ANIMALS FROM GROUP 4: 150 MG LINURON												
97128	-14.	-14.	1.	29.	-22.	10.	-14.	0.	-2.	-1.	0.	7.
97140	-10.	-12.	3.	25.	-23.	0.	1.	-2.	2.	2.	5.	-4.
97142	-12.	-5.	-6.	-3.	13.	8.	4.	-11.	0.	9.	2.	-3.
97144	-6.	-5.	-3.	-2.	6.	-1.	3.	-8.	-5.	2.	0.	4.
97161	-17.	-20.	-17.	-14.	17.	9.	-2.	-8.	3.	4.	2.	1.
97162	-9.	-5.	-20.	7.	19.	7.	7.	-16.	-9.	-8.	-9.	34.
97171	-21.	-8.	-1.	7.	4.	-1.	-7.	-3.	1.	5.	6.	2.
97174	-17.	-18.	-3.	-1.	3.	-2.	-1.	2.	-1.	2.	3.	7.
97207	-29.	-20.	-13.	-4.	12.	16.	-4.	-3.	4.	-4.	5.	13.
97211	-25.	-17.	1.	6.	3.	-5.	-3.	5.	0.	5.	-6.	11.
97214	-22.	6.	-19.	-2.	-1.	-7.	-4.	4.	-5.	9.	-4.	-3.
97222	-26.	13.	-25.	3.	6.	5.	-2.	0.	-10.	2.	5.	9.
97223	-34.	23.	-43.	-19.								
97225	-14.	-3.	-28.	1.	19.	-3.	2.	-6.	0.	1.	11.	3.
97231	-33.	-26.	1.	-2.	2.	-9.	-2.	17.	-4.	-2.	17.	-5.
MEAN	-19.	-7.	-11.	2.	4.	2.	-2.	-2.	-2.	2.	3.	5.
S.D.	8.8	13.3	13.4	12.3	13.1	7.0	5.1	8.1	4.2	4.7	6.6	10.0
N	15	15	15	15	14	14	14	14	14	14	14	14

MALES

DAY	13- 14	14- 15	1- 8	8- 15	1- 15
ANIMALS FROM GROUP 4: 150 MG LINURON					
97128	8.	-5.	-24.	6.	-18.
97140	3.	3.	-17.	9.	-8.
97142	4.	2.	-1.	3.	2.
97144	-1.	3.	-9.	-6.	-15.
97161	4.	-2.	-45.	4.	-41.
97162	11.	4.	7.	7.	14.
97171	-7.	3.	-26.	7.	-19.
97174	0.	4.	-39.	16.	-23.
97207	-5.	14.	-41.	24.	-17.
97211	-10.	10.	-41.	16.	-25.
97214	-1.	18.	-48.	18.	-30.
97222	4.	-7.	-27.	2.	-25.
97225	4.	3.	-26.	15.	-11.
97231	-16.	13.	-68.	20.	-48.
MEAN	0.	4.	-29.	10.	-19.
S.D.	7.1	7.1	19.9	8.2	15.9
N	14	14	14	14	14

MALES

DAY	1- 2	2- 3	3- 4	4- 5	5- 6	6- 7	7- 8	8- 9	9- 10	10- 11	11- 12	12- 13
ANIMALS FROM GROUP 5: 25 MG PHENO												
97121	9.	1.	4.	-15.	14.	2.	2.	7.	3.	7.	4.	5.
97127	14.	5.	10.	7.	10.	5.	12.	2.	6.	4.	6.	6.
97131	9.	5.	2.	4.	7.	7.	7.	1.	5.	0.	3.	6.
97133	11.	10.	2.	9.	9.	9.	2.	3.	7.	6.	2.	5.
97134	13.	3.	7.	3.	-2.	3.	6.	7.	8.	4.	7.	6.
97141	8.	6.	1.	2.	6.	1.	2.	3.	2.	4.	5.	3.
97143	5.	4.	8.	2.	4.	2.	-4.	12.	-2.	-2.	7.	1.
97151	15.	3.	9.	2.	8.	-1.	7.	4.	6.	-3.	6.	7.
97155	10.	-5.	3.	1.	0.	-2.	6.	1.	2.	0.	2.	2.
97173	14.	6.	7.	8.	4.	6.	4.	3.	8.	6.	5.	3.
97180	13.	8.	1.	4.	4.	0.	-1.	9.	0.	7.	3.	-3.
97186	12.	0.	-1.	1.	2.	1.	1.	8.	1.	7.	3.	-3.
97218	11.	4.	1.	4.	4.	1.	3.	4.	3.	5.	3.	-2.
97233	8.	7.	6.	-3.	6.	6.	1.	4.	6.	0.	7.	5.
97235	8.	3.	0.	-1.	1.	6.	1.	4.	4.	1.	5.	-1.
MEAN	10.	4.	4.	2.	5.	3.	3.	5.	4.	3.	5.	2.
S.D.	2.9	3.4	3.5	5.6	4.1	3.4	3.8	3.2	3.0	3.3	1.9	3.6
N	15	15	15	15	15	15	15	15	15	15	15	15

MALES

DAY	13- 14	14- 15	1- 8	8- 15	1- 15
ANIMALS FROM GROUP 5: 25 MG PHENO					
97121	8.	1.	17.	34.	51.
97127	6.	10.	61.	40.	101.
97131	-2.	5.	40.	18.	58.
97133	4.	5.	51.	31.	83.
97134	4.	5.	33.	38.	72.
97141	-4.	8.	24.	21.	45.
97143	-2.	-1.	21.	13.	34.
97151	-1.	7.	42.	27.	68.
97155	-3.	4.	12.	7.	19.
97173	4.	3.	48.	32.	80.
97180	1.	9.	27.	26.	53.
97186	4.	4.	14.	24.	38.
97218	1.	10.	28.	24.	52.
97233	1.	3.	30.	26.	56.
97235	2.	7.	18.	21.	38.
MEAN	1.	5.	31.	25.	57.
S.D.	3.3	3.1	14.6	8.9	21.3
N	15	15	15	15	15

MALES

DAY	1- 2	2- 3	3- 4	4- 5	5- 6	6- 7	7- 8	8- 9	9- 10	10- 11	11- 12	12- 13
ANIMALS FROM GROUP 6: 50 MG PHENO												
97123	11.	7.	-1.	9.	3.	4.	4.	-2.	-1.	13.	-1.	5.
97129	9.	4.	2.	3.	0.	8.	0.	-5.	6.	7.	-3.	2.
97135	18.	5.	3.	5.	-2.	4.	2.	7.	2.	6.	2.	5.
97139	12.	5.	5.	5.	0.	7.	2.	1.	5.	3.	3.	2.
97146	15.	6.	7.	5.	-2.	6.	1.	8.	1.	7.	6.	1.
97149	7.	3.	7.	6.	0.	3.	5.	5.	5.	0.	3.	5.
97183	9.	4.	8.	2.	0.	1.	-4.	7.	2.	-2.	1.	5.
97190	7.	11.	11.	0.	2.	9.	8.	2.	11.	3.	4.	5.
97195	-4.	3.	1.	3.	4.	2.	1.	4.	2.	3.	0.	5.
97203	15.	1.	12.	-1.	6.	2.	-1.	-3.	6.	4.	2.	3.
97215	9.	4.	4.	4.	5.	7.	3.	5.	5.	8.	5.	4.
97228	16.	1.	1.	2.	0.	3.	-4.	3.	1.	2.	4.	1.
97229	13.	2.	-1.	-5.	4.	1.	-3.	5.	4.	-1.	3.	3.
97230	7.	9.	4.	-2.	2.	0.	-1.	-2.	-1.	2.	0.	4.
97232	8.	7.	6.	3.	4.	2.	-3.	3.	5.	5.	2.	2.
MEAN	10.	5.	4.	3.	2.	4.	1.	3.	4.	4.	2.	3.
S.D.	5.3	2.9	3.9	3.5	2.5	2.8	3.4	4.1	3.0	3.8	2.3	1.5
N	15	15	15	15	15	15	15	15	15	15	15	15

MALES

DAY	13- 14	14- 15	1- 8	8- 15	1- 15
ANIMALS FROM GROUP 6: 50 MG PHENO					
97123	1.	1.	37.	17.	53.
97129	1.	3.	24.	10.	34.
97135	4.	3.	34.	28.	62.
97139	3.	3.	35.	20.	55.
97146	4.	8.	37.	34.	71.
97149	-2.	6.	31.	21.	52.
97183	2.	3.	19.	19.	39.
97190	1.	6.	49.	31.	80.
97195	3.	2.	11.	18.	30.
97203	3.	6.	34.	21.	55.
97215	6.	7.	36.	41.	76.
97228	3.	6.	19.	19.	39.
97229	3.	4.	10.	20.	29.
97230	6.	5.	18.	15.	33.
97232	4.	4.	27.	24.	51.
MEAN	3.	4.	28.	22.	51.
S.D.	2.0	2.0	10.9	8.0	16.7
N	15	15	15	15	15

MALES

DAY	1- 2	2- 3	3- 4	4- 5	5- 6	6- 7	7- 8	8- 9	9- 10	10- 11	11- 12	12- 13
ANIMALS FROM GROUP 7: 100 MG PHENO												
97120	7.	-8.	5.	1.	4.	2.	0.	3.	-3.	3.	1.	5.
97130	-1.	-17.	5.	11.	7.	6.	2.	-2.	3.	8.	3.	5.
97145	2.	-25.	-9.	10.	6.	5.	3.	5.	-2.	-2.	7.	6.
97154	0.	-4.	7.	10.	6.	-2.	4.	3.	4.	5.	3.	4.
97158	3.	-13.	8.	1.	-1.	5.	-1.	2.	2.	2.	4.	2.
97160	-1.	-10.	5.	2.	12.	4.	1.	2.	9.	-2.	3.	5.
97175	2.	-40.	NA									
97177	7.	-12.	2.	9.	2.	0.	1.	6.	7.	6.	2.	2.
97182	-5.	-6.	9.	3.	0.	5.	2.	1.	8.	3.	2.	-1.
97187	3.	4.	7.	14.	-1.	4.	4.	-1.	8.	5.	7.	3.
97191	0.	-13.	-9.	13.	8.	13.	3.	11.	4.	3.	4.	4.
97194	-8.	-24.	-7.	-4.	9.	13.	13.	7.	6.	13.	1.	-1.
97209	3.	-6.	-5.	1.	4.	2.	-2.	7.	0.	2.	4.	2.
97216	21.	-6.	6.	0.	-5.	3.	-5.	15.	6.	3.	6.	0.
97224	-12.	0.	4.	3.	12.	4.	-1.	5.	9.	2.	8.	6.
MEAN	1.	-12.	2.	5.	5.	5.	2.	4.	4.	4.	4.	3.
S.D.	7.3	11.1	6.5	5.6	5.0	4.1	4.1	4.4	3.9	3.9	2.3	2.4
N	15	15	14	14	14	14	14	14	14	14	14	14

NA = NOT APPLICABLE

MALES

DAY	13- 14	14- 15	1- 8	8- 15	1- 15
ANIMALS FROM GROUP 7: 100 MG PHENO					
97120	3.	5.	9.	16.	26.
97130	5.	4.	13.	26.	39.
97145	4.	5.	-9.	22.	13.
97154	5.	-14.	21.	10.	31.
97158	2.	6.	2.	20.	22.
97160	3.	3.	12.	24.	37.
97177	5.	6.	10.	34.	44.
97182	1.	7.	9.	21.	29.
97187	6.	5.	36.	33.	69.
97191	2.	9.	15.	36.	51.
97194	2.	8.	-8.	36.	28.
97209	3.	0.	-3.	17.	15.
97216	4.	8.	14.	42.	55.
97224	6.	5.	10.	41.	51.
MEAN	4.	4.	9.	27.	36.
S.D.	1.6	5.6	11.5	9.9	16.1
N	14	14	14	14	14

SPONSOR:BATTELLE INDIVIDUAL FOOD CONSUMPTION [GRAMS/KG/DAY]
SPONSOR NO.:68-W-01-023

MALES

DAY	1- 8	8- 15	1- 15
ANIMALS FROM GROUP 1: METHYLCELLULOSE			
97126	77.	70.	73.
97136	74.	82.	78.
97157	78.	73.	76.
97159	74.	67.	71.
97168	74.	63.	68.
97172	77.	NA	NA
97192	76.	65.	70.
97198	81.	68.	74.
97200	74.	66.	70.
97205	79.	71.	75.
97212	75.	65.	70.
97213	79.	70.	74.
97226	77.	70.	73.
97227	75.	66.	70.
97237	72.	64.	68.
MEAN	76.	68.	72.
S.D.	2.6	4.8	3.0
N	15	14	14

NA = NOT APPLICABLE

MALES

DAY	1- 8	8- 15	1- 15
ANIMALS FROM GROUP 2: 50 MG LINURON			
97122	NA	83.	NA
97124	72.	71.	71.
97125	63.	58.	61.
97137	68.	69.	68.
97138	56.	67.	61.
97165	50.	58.	54.
97176	43.	55.	49.
97189	66.	73.	70.
97197	69.	67.	68.
97199	51.	86.	69.
97206	71.	73.	72.
97210	64.	NA	NA
97217	66.	53.	60.
97221	70.	76.	73.
97236	70.	76.	73.
MEAN	63.	69.	65.
S.D.	9.0	10.0	7.6
N	14	14	13

NA = NOT APPLICABLE

MALES

DAY	1- 8	8- 15	1- 15
ANIMALS FROM GROUP 3: 100 MG LINURON			
97119	NA	77.	NA
97132	40.	59.	49.
97148	42.	64.	53.
97150	62.	67.	65.
97152	41.	57.	49.
97163	43.	49.	46.
97166	47.	63.	55.
97167	62.	64.	63.
97170	44.	70.	57.
97181	42.	61.	51.
97184	52.	55.	54.
97185	55.	63.	59.
97188	53.	62.	57.
97193	38.	60.	48.
97238	55.	69.	62.
MEAN	48.	62.	55.
S.D.	8.1	6.7	5.9
N	14	15	14

NA = NOT APPLICABLE

MALES

DAY	1- 8	8- 15	1- 15
ANIMALS FROM GROUP 4: 150 MG LINURON			
97128	44.	49.	47.
97140	43.	47.	45.
97142	63.	64.	63.
97144	62.	45.	53.
97161	36.	63.	49.
97162	62.	46.	54.
97171	54.	56.	55.
97174	43.	57.	50.
97207	37.	63.	50.
97211	NA	64.	NA
97214	32.	54.	43.
97222	47.	55.	51.
97225	46.	50.	48.
97231	27.	59.	43.
MEAN	46.	55.	50.
S.D.	11.6	6.8	5.6
N	13	14	13

NA = NOT APPLICABLE

MALES

DAY	1- 8	8- 15	1- 15
ANIMALS FROM GROUP 5:	25 MG PHENO		
97121	86.	76.	81.
97127	87.	74.	80.
97131	77.	65.	71.
97133	88.	75.	81.
97134	78.	79.	79.
97141	82.	64.	73.
97143	78.	64.	71.
97151	79.	67.	73.
97155	70.	66.	68.
97173	85.	70.	77.
97180	77.	65.	71.
97186	72.	66.	69.
97218	76.	64.	70.
97233	80.	65.	72.
97235	69.	65.	67.
MEAN	79.	68.	73.
S.D.	6.0	5.1	4.9
N	15	15	15

MALES

DAY	1- 8	8- 15	1- 15
ANIMALS FROM GROUP 6:	50 MG PHENO		
97123	80.	67.	73.
97129	75.	61.	68.
97135	77.	66.	71.
97139	84.	68.	76.
97146	83.	68.	75.
97149	NA	78.	NA
97183	83.	68.	75.
97190	77.	68.	73.
97195	72.	69.	70.
97203	81.	67.	74.
97215	66.	63.	65.
97228	81.	68.	74.
97229	96.	NA	NA
97230	77.	64.	70.
97232	87.	74.	81.
MEAN	80.	68.	73.
S.D.	7.0	4.3	4.0
N	14	14	13

NA = NOT APPLICABLE

MALES

DAY	1- 8	8- 15	1- 15
ANIMALS FROM GROUP 7:	100 MG PHENO		
97120	75.	68.	71.
97130	68.	72.	70.
97145	57.	70.	64.
97154	79.	NA	NA
97158	72.	68.	70.
97160	75.	73.	74.
97177	72.	65.	69.
97182	72.	65.	68.
97187	86.	76.	81.
97191	70.	81.	76.
97194	52.	74.	64.
97209	75.	74.	75.
97216	73.	74.	74.
97224	72.	80.	76.
MEAN	71.	72.	72.
S.D.	8.2	5.2	4.9
N	14	13	13

NA = NOT APPLICABLE

ANIMAL	TESTOSTERONE	LUTEIN' HORMONE	TSH	TOTAL T4	TOTAL T3	FSH	ESTRADIOL	PROLACTIN -A	DHT
	ng/dL	ng/ml	ng/ml	uG/dl	ng/dL	ng/ml	pg/ml	ng/ml	pg/ml
GROUP: METHYLCELLULOSE		MALES							
97126	219.0	1.3	14.3	6.10	92.70	13.3	38.20	5.0	87.9
97136	459.3	0.4-A	23.0	3.00	65.10	14.5	105.90	1.5	128.4
97157	524.0	0.9	7.9	5.10	77.10	15.1	33.30	1.0	165.3
97159	840.0	0.8	15.7	4.70	83.60	12.9	62.60	2.9	287.1
97168	454.4	0.4-A	8.5	6.00	91.40	10.6	52.30	5.0	240.3
97172	311.9	0.4-A	20.5	5.60	76.00	13.3	26.60	3.6	78.5
97192	733.8	0.4-A	13.0	4.10	73.00	10.4	31.80	1.3	140.1
97198	247.4	1.0	14.2	4.90	72.50	15.0	38.40	2.8	68.2
97200	516.5	1.1	23.8	5.10	83.60	10.6	28.60	1.7	389.1
97205	1548.4	0.8	12.5	3.70	90.30	13.1	30.40	2.8	549.2
97212	186.5	0.4-A	8.7	4.90	72.10	9.9	23.40	RU-B	62.7
97213	800.5	0.4-A	10.7	5.00	71.00	11.7	21.40	RU-B	225.7
97226	431.1	0.4-A	15.6	5.60	100.30	14.8	23.50	RU-B	133.3
97227	1029.6	1.3	31.1	5.50	67.50	18.4	38.30	4.7	451.4
97237	903.4	0.4-A	11.4	5.30	83.70	13.4	20.60	RU-B	376.9
MEAN	613.7	0.7	15.4	4.97	79.99	13.1	38.35	2.9	225.6
S.D.	367.88	0.35	6.57	0.840	10.352	2.28	21.969	1.49	153.56
N	15	15	15	15	15	15	15	11	15

RU = RESULT UNOBTAINABLE

ng/ml = NANOGRAMS/MILLILITER, ng/dL = NANOGRAMS/DECILITER, pg/ml = PICOGRAMS/MILLILITER,
uG/dl = MICROGRAMS/DECILITER
A = BELOW THE LOWER LIMIT OF SENSITIVITY; VALUE REPRESENTS HALF OF THE LOWEST STANDARD.
B = SAMPLES REASSAYED AT GREATER VOLUME (100 uL) THAN ORIGINAL ASSAY (50 uL); NOT ALL SAMPLES REASSAYED DUE TO LACK OF RIA KIT MATERIALS OR REMAINING SERUM.

ANIMAL	TESTOSTERONE	LUTEINIZING HORMONE	TSH	TOTAL T4	TOTAL T3	FSH	ESTRADIOL	PROLACTIN -A	DHT
	ng/dL	ng/ml	ng/ml	uG/dl	ng/dL	ng/ml	pg/ml	ng/ml	pg/ml
GROUP: 50 MG LINURON		MALES							
97122	1003.6	1.4	25.0	1.20	65.40	16.0	RU-C	1.0	174.3
97124	1370.7	1.2	13.3	2.30	79.80	17.5	RU-C	2.1	283.3
97125	72.0	0.8	15.2	3.30	85.80	16.9	47.60	4.9	15.0-A
97137	221.5	1.2	12.4	3.20	53.00	14.1	72.80	1.6	87.2
97138	357.1	0.4-A	16.1	2.30	70.20	17.3	43.60	1.2	114.6
97165	584.7	0.4-A	16.3	2.90	72.20	17.8	66.90	1.7	143.4
97176	161.7	0.4-A	11.2	1.90	60.40	14.7	43.60	1.0	53.0
97189	1058.5	1.4	22.7	3.10	82.20	15.6	43.90	0.4-A	194.7
97197	114.8	0.4-A	8.2	2.80	96.10	14.6	40.60	2.1	53.0
97199	1473.8	0.9	9.7	2.20	97.30	18.0	40.10	RU-B	564.5
97206	422.4	0.4-A	13.6	2.40	75.40	16.3	32.70	16.3	123.5
97210	854.0	0.8	11.8	2.00	73.60	13.1	39.90	1.6	183.2
97217	737.9	1.3	10.4	2.10	77.40	14.4	39.10	RU-B	178.0
97221	647.2	0.4-A	14.8	3.70	103.20	12.1	28.00	1.2	123.3
97236	395.5	1.8	8.5	4.90	87.40	17.6	34.80	5.4	124.7
MEAN	631.7	0.9	13.9	2.69	78.63	15.7	44.12	3.1	161.0
S.D.	445.89	0.48	4.78	0.889	13.923	1.84	12.593	4.23	129.99
N	15	15	15	15	15	15	13	13	15

RU = RESULT UNOBTAINABLE

ng/ml = NANOGRAMS/MILLILITER, ng/dL = NANOGRAMS/DECILITER, pg/ml = PICOGRAMS/MILLILITER,
uG/dl = MICROGRAMS/DECILITER

A = BELOW THE LOWER LIMIT OF SENSITIVITY; VALUE REPRESENTS HALF OF THE LOWEST STANDARD.
B = SAMPLES REASSAYED AT GREATER VOLUME (100 uL) THAN ORIGINAL ASSAY (50 uL); NOT ALL SAMPLES REASSAYED DUE TO LACK OF RIA KIT MATERIALS OR REMAINING SERUM.
C = VALUES FROM ORIGINAL ANALYSES WERE HIGHLY VARIABLE, HAVING A PERCENT COEFFICIENT OF VARIATION GREATER THAN 15; SAMPLES REASSAYED, BUT VALUES COULD NOT BE CALCULATED BECAUSE THE STANDARD CURVE DID NOT MEET CRITERIA FOR ACCEPTABILITY.

ANIMAL	TESTOSTERONE	LUTEINIZING HORMONE	TSH	TOTAL T4	TOTAL T3	FSH	ESTRADIOL	PROLACTIN -A	DHT
	ng/dL	ng/ml	ng/ml	uG/dl	ng/dL	ng/ml	pg/ml	ng/ml	pg/ml
GROUP: 100 MG LINURON		MALES							
97119	314.3	0.4-A	10.6	0.30	53.70	13.6	33.80	3.5	117.6
97132	401.6	0.4-A	16.4	0.60	72.40	20.3	196.10	1.2	157.1
97148	1104.5	0.9	12.9	0.90	51.30	12.9	46.20	2.4	312.7
97150	1153.0	0.4-A	11.9	1.30	70.20	19.2	54.10	2.4	484.1
97152	429.8	0.4-A	8.6	2.70	80.60	15.7	66.10	1.6	158.4
97163	42.9	0.4-A	7.5	0.60	48.40	13.2	29.60	1.5	42.4
97166	825.0	1.3	29.5	0.80	58.80	20.6	53.30	1.6	313.0
97167	1035.3	0.4-A	17.6	1.70	74.00	18.0	39.80	1.6	284.9
97170	2179.1	1.7	9.9	1.60	85.40	21.1	77.10	3.8	671.2
97181	201.9	0.4-A	8.9	3.20	85.00	13.6	36.70	0.9	86.9
97184	190.2	0.4-A	10.2	0.80	60.50	15.6	32.30	1.6	65.8
97185	430.1	0.8	11.0	1.60	82.60	21.3	74.70	RU-B	111.7
97188	191.7	1.3	9.0	1.00	64.30	23.0	29.10	RU-B	50.3
97193	10.0	0.4-A	8.9	0.90	78.30	9.5	47.70	RU-B	44.2
97238	828.2	0.4-A	10.8	1.30	82.60	11.0	38.40	RU-B	271.3
MEAN	622.5	0.7	12.2	1.29	69.87	16.6	57.00	2.0	211.4
S.D.	577.49	0.44	5.54	0.793	12.852	4.21	41.495	0.92	181.07
N	15	15	15	15	15	15	15	11	15

RU = RESULT UNOBTAINABLE

ng/ml = NANOGRAMS/MILLILITER, ng/dL = NANOGRAMS/DECILITER, pg/ml = PICOGRAMS/MILLILITER,
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ANIMAL	TESTOSTERONE	LUTEIN' HORMONE	TSH	TOTAL T4	TOTAL T3	FSH	ESTRADIOL	PROLACTIN -A	DHT
	ng/dL	ng/ml	ng/ml	uG/dl	ng/dL	ng/ml	pg/ml	ng/ml	pg/ml
GROUP: 150 MG LINURON		MALES							
97128	24.5	0.4-A	6.8	0.40	63.10	11.2	38.20	0.4-A	15.0-A
97140	75.0	1.2	9.5	0.60	47.40	12.0	142.10	1.6	81.7
97142	752.4	0.9	24.1	0.70	82.90	13.6	66.30	2.1	188.7
97144	60.6	0.4-A	5.8	0.60	61.10	16.0	36.20	1.6	52.7
97161	218.7	1.4	19.3	0.90	79.60	21.3	58.40	1.5	110.2
97162	238.6	1.3	8.0	0.10	55.60	14.9	40.70	3.1	68.7
97171	1074.5	0.4-A	10.1	0.20	56.60	12.0	53.20	1.5	533.9
97174	222.0	0.4-A	6.1	0.30	57.90	17.8	48.60	1.1	84.8
97207	702.4	0.4-A	15.3	0.40	85.00	17.4	RU-C	1.6	188.0
97211	534.2	0.4-A	12.2	0.70	76.90	15.3	38.60	RU-B	191.4
97214	1431.1	0.4-A	11.6	0.40	57.40	17.1	40.80	RU-B	669.1
97222	98.6	0.4-A	9.3	0.50	67.60	12.5	36.40	RU-B	58.3
97225	75.7	0.4-A	15.2	0.60	73.90	16.1	49.70	RU-B	34.8
97231	235.1	0.4-A	6.1	0.90	72.20	15.6	33.90	RU-B	113.4
MEAN	410.2	0.6	11.4	0.52	66.94	15.2	52.55	1.6	170.8
S.D.	431.98	0.39	5.43	0.239	11.622	2.78	28.609	0.73	192.81
N	14	14	14	14	14	14	13	9	14

RU = RESULT UNOBTAINABLE

ng/ml = NANOGRAMS/MILLILITER, ng/dL = NANOGRAMS/DECILITER, pg/ml = PICOGRAMS/MILLILITER,
uG/dl = MICROGRAMS/DECILITER

A = BELOW THE LOWER LIMIT OF SENSITIVITY; VALUE REPRESENTS HALF OF THE LOWEST STANDARD.
B = SAMPLES REASSAYED AT GREATER VOLUME (100 uL) THAN ORIGINAL ASSAY (50 uL); NOT ALL SAMPLES REASSAYED DUE TO LACK OF RIA KIT MATERIALS OR REMAINING SERUM.
C = VALUES FROM ORIGINAL ANALYSES WERE HIGHLY VARIABLE, HAVING A PERCENT COEFFICIENT OF VARIATION GREATER THAN 15; SAMPLES REASSAYED, BUT VALUES COULD NOT BE CALCULATED BECAUSE THE STANDARD CURVE DID NOT MEET CRITERIA FOR ACCEPTABILITY.

ANIMAL	TESTOS TERONE	LUTEIN' HORMONE	TSH	TOTAL T4	TOTAL T3	FSH	ESTRA DIOL	PRO LACTIN -A	DHT
	ng/dL	ng/ml	ng/ml	uG/dl	ng/dL	ng/ml	pg/ml	ng/ml	pg/ml
GROUP: 25 MG PHENO		MALES							
97121	473.1	1.5	13.6	4.40	86.80	11.1	42.20	3.2	130.4
97127	327.4	0.4-A	11.1	2.50	66.80	8.2	77.50	1.5	69.8
97131	148.6	1.0	14.1	4.50	59.10	11.3	62.00	2.7	57.3
97133	594.4	0.4-A	24.5	3.30	68.50	14.5	33.30	1.2	235.7
97134	61.5	0.8	15.6	6.70	71.90	9.1	40.00	0.9	37.8
97141	531.3	1.1	27.5	3.70	67.50	13.4	47.70	5.2	152.1
97143	253.6	0.4-A	26.0	2.70	65.40	10.7	44.40	0.8	132.4
97151	453.8	0.4-A	22.4	4.50	78.40	13.0	37.30	1.3	158.4
97155	469.2	0.4-A	34.5	5.30	61.40	9.2	47.10	2.1	92.7
97173	452.9	0.4-A	31.1	3.70	79.30	11.7	35.20	RU-B	114.2
97180	791.4	0.4-A	40.3	4.70	76.30	11.3	38.30	RU-B	249.3
97186	799.3	0.9	18.7	4.80	86.20	9.5	36.50	RU-B	212.8
97218	783.7	0.4-A	16.1	4.30	79.40	10.1	37.10	RU-B	253.5
97233	142.6	0.4-A	23.2	4.50	77.30	12.0	10.00-A	3.1	63.3
97235	429.2	0.8	41.5	2.40	56.30	10.4	34.70	3.2	164.7
MEAN	447.5	0.6	24.0	4.13	72.04	11.0	41.55	2.3	141.6
S.D.	234.29	0.35	9.58	1.134	9.429	1.73	14.675	1.34	71.46
N	15	15	15	15	15	15	15	11	15

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B = SAMPLES REASSAYED AT GREATER VOLUME (100 uL) THAN ORIGINAL ASSAY (50 uL); NOT ALL SAMPLES REASSAYED DUE TO LACK OF RIA KIT MATERIALS OR REMAINING SERUM.

ANIMAL	TESTOSTERONE	LUTEIN' HORMONE	TSH	TOTAL T4	TOTAL T3	FSH	ESTRADIOL	PROLACTIN -A	DHT
	ng/dL	ng/ml	ng/ml	uG/dl	ng/dL	ng/ml	pg/ml	ng/ml	pg/ml
GROUP: 50 MG PHENO		MALES							
97123	231.2	0.4-A	44.8	1.60	49.80	15.7	RU-C	2.6	55.3
97129	54.7	0.4-A	16.0	3.30	67.50	7.8	118.90	1.0	35.3
97135	1015.8	1.0	16.3	3.40	66.50	17.4	58.90	8.6	279.7
97139	283.4	0.4-A	10.8	3.20	62.60	11.3	43.00	3.1	97.3
97146	248.4	1.0	14.8	2.00	55.90	8.2	30.70	1.0	90.4
97149	135.0	0.4-A	42.7	3.00	45.00	11.7	51.10	3.1	62.3
97183	115.9	0.4-A	20.6	2.50	74.10	9.9	43.10	2.4	50.9
97190	217.6	0.4-A	26.2	2.60	65.10	8.2	49.20	1.4	112.5
97195	408.8	0.4-A	26.2	3.10	52.10	10.1	30.10	RU-B	132.0
97203	156.1	0.4-A	32.0	3.00	79.00	10.3	43.70	0.8	51.4
97215	383.0	0.4-A	36.5	3.60	58.00	10.7	49.20	1.4	124.5
97228	288.6	0.8	17.1	3.00	75.20	10.9	41.50	RU-B	79.1
97229	1055.7	0.8	35.1	2.40	48.50	12.1	52.50	1.3	513.3
97230	133.2	0.8	23.8	3.60	71.60	10.9	38.10	RU-B	50.5
97232	524.8	0.4-A	24.6	3.10	70.70	12.6	33.70	RU-B	170.3
MEAN	350.1	0.6	25.8	2.89	62.77	11.2	48.84	2.4	127.0
S.D.	304.65	0.24	10.44	0.573	10.691	2.61	21.840	2.22	123.71
N	15	15	15	15	15	15	14	11	15

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ANIMAL	TESTOSTERONE	LUTEIN' HORMONE	TSH	TOTAL T4	TOTAL T3	FSH	ESTRADIOL	PROLACTIN -A	DHT
	ng/dL	ng/ml	ng/ml	uG/dl	ng/dL	ng/ml	pg/ml	ng/ml	pg/ml
GROUP: 100 MG PHENO		MALES							
97120	813.1	1.0	36.9	0.40	49.00	11.2	495.90	1.2	212.0
97130	276.3	0.9	16.9	2.70	58.00	11.7	85.40	1.6	78.8
97145	72.1	1.1	12.3	1.10	61.80	11.6	46.10	1.2	51.9
97154	379.1	0.4-A	39.6	1.30	62.90	12.7	51.90	1.2	135.4
97158	126.1	1.3	61.0	0.40	40.60	18.0	73.80	8.9	60.8
97160	133.4	0.4-A	33.9	2.00	60.90	12.7	74.20	1.0	51.8
97177	140.9	1.4	28.3	1.60	58.20	9.1	63.40	1.7	63.9
97182	151.7	1.0	46.5	2.30	57.40	11.2	63.50	1.5	50.1
97187	637.7	1.0	34.4	2.10	61.60	14.4	54.50	RU-B	229.7
97191	508.8	0.4-A	24.1	2.20	69.90	10.5	44.10	RU-B	122.9
97194	65.4	0.4-A	28.8	1.40	57.10	9.6	52.90	RU-B	34.4
97209	25.5	0.4-A	18.1	2.90	57.80	10.3	44.20	RU-B	32.0
97216	275.2	0.4-A	36.3	2.10	52.30	10.0	53.20	1.6	75.6
97224	412.6	0.8	28.9	1.40	51.70	11.3	51.30	RU-B	194.7
MEAN	287.0	0.8	31.9	1.71	57.09	11.7	89.60	2.2	99.6
S.D.	236.36	0.37	12.61	0.762	7.054	2.27	117.594	2.52	67.96
N	14	14	14	14	14	14	14	9	14

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UNSCHEDULED DEATHS

PROJECT NO.:WIL-431014 INTER-LAB 15-DAY MALE RAT ASSAY WITH LINURON & PHENOBARBITAL
SPONSOR:BATTELLE INDIVIDUAL MACROSCOPIC FINDINGS
SPONSOR NO.:68-W-01-023

ANIMAL NO. 97223 GROUP 4: 150 MG LINURON MALE EUTH IN EXTREMIS 10/30/05 DATE OF DEATH: 10/30/05

					GRADE
NO SIGNIFICANT CHANGES OBSERVED	GROSS:	ADRENAL GLANDS	BRAIN	EPIDIDYMIDES	ESOPHAGUS
		EYES	HEART	INTESTINE	KIDNEYS
		LIVER	LYMPH NODE, MES	LUNGS	MAMMARY GLAND
		TESTIS, LT	TESTIS, RT	PANCREAS	PITUITARY
		PROSTATE	SPINAL CORD	SAL. GLAND MAND	SKIN
		SPLEEN	STOMACH	SEMINAL VESICLES	THYMUS
		THYROID GLANDS	TRACHEA	URINARY BLADDER	COAGULATING GL

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

ANIMAL NO. 97175 GROUP 7: 100 MG PHENO MALE FOUND DEAD 10/28/05 DATE OF DEATH: 10/28/05

			GRADE
SKIN	GROSS: MATTING, YELLOW BUCCAL		P
STOMACH	GROSS: CONTENTS, YELLOW		P
URINARY BLADDER	GROSS: DISTENDED		P
NO SIGNIFICANT CHANGES OBSERVED	GROSS: ADRENAL GLANDS, BRAIN, EPIDIDYMIDES, ESOPHAGUS; EYES, HEART, INTESTINE, KIDNEYS; LIVER, LYMPH NODE, MES, LUNGS, MAMMARY GLAND; TESTIS, LT, TESTIS, RT, PANCREAS, PITUITARY; PROSTATE, SPINAL CORD, SAL. GLAND MAND, SPLEEN; SEMINAL VESICLES, THYMUS, THYROID GLANDS, TRACHEA; COAGULATING GL		

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

SCHEDULED EUTHANASIA

PROJECT NO.:WIL-431014 INTER-LAB 15-DAY MALE RAT ASSAY WITH LINURON & PHENOBARBITAL
SPONSOR:BATTELLE INDIVIDUAL MACROSCOPIC AND MICROSCOPIC FINDINGS
SPONSOR NO.:68-W-01-023

ANIMAL NO. 97126 GROUP 1:METHYLCELLULOSE MALE SCHEDULED EUTH 11/07/05 DATE OF DEATH: 11/07/05

ORGAN WEIGHT	ABS.(G)	REL.
LIVER	13.2813	3.679
SEM VES/CG/FLUID	1.5395	0.426
PROSTATE	0.5541	0.153
EPIDIDYMIDES	0.8847	0.245
TESTIS, RT	1.6472	0.456
TESTIS, LT	1.6235	0.450
THYROID GLANDS	0.0170	0.005
FINAL BODY WT(G)	361.	

EPIDIDYMIDES NO SIGNIFICANT CHANGES OBSERVED
THYROID GLANDS NO SIGNIFICANT CHANGES OBSERVED

				GRADE
MICRO: INFILTRATE, MONONUCLEAR				
FOCAL				1
MICRO: FOLLICULAR EPITHELIAL HEIGHT				
BILATERAL				2
COLLOID AREA				
BILATERAL				3

GROSS:

ADRENAL GLANDS	BRAIN	EPIDIDYMIDES	ESOPHAGUS
EYES	HEART	INTESTINE	KIDNEYS
LIVER	LYMPH NODE, MES	LUNGS	MAMMARY GLAND
TESTIS, LT	TESTIS, RT	PANCREAS	PITUITARY
PROSTATE	SPINAL CORD	SAL. GLAND MAND	SKIN
SPLEEN	STOMACH	SEMINAL VESICLES	THYMUS
THYROID GLANDS	TRACHEA	URINARY BLADDER	COAGULATING GL

MICRO:TESTES

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL, 2-MILD, 3-MODERATE, 4-SEVERE, P-PRESENT

ANIMAL NO. 97136 GROUP 1:METHYLCELLULOSE MALE SCHEDULED EUTH 11/07/05 DATE OF DEATH: 11/07/05

ORGAN WEIGHT	ABS.(G)	REL.
LIVER	14.1060	3.673
SEM VES/CG/FLUID	1.7555	0.457
PROSTATE	1.1524	0.300
EPIDIDYMIDES	0.9990	0.260
TESTIS, RT	1.7042	0.444
TESTIS, LT	1.6746	0.436
THYROID GLANDS	0.0188	0.005
FINAL BODY WT(G)	384.	

		GRADE
EPIDIDYMIDES	MICRO: INFILTRATE, MONONUCLEAR	
	FOCAL	1
THYROID GLANDS	MICRO: FOLLICULAR EPITHELIAL HEIGHT	
	BILATERAL	3
	COLLOID AREA	
	BILATERAL	1
	CYST, ULTIMOBRANCHIAL	
	MULTIFOCAL, BILATERAL	1
	MITOTIC FIGURES	
	MULTIFOCAL, BILATERAL	1

NO SIGNIFICANT CHANGES OBSERVED

GROSS: ADRENAL GLANDS, BRAIN, EPIDIDYMIDES, ESOPHAGUS, EYES, HEART, INTESTINE, KIDNEYS, LIVER, LYMPH NODE, MES, LUNGS, MAMMARY GLAND, TESTIS, LT, TESTIS, RT, PANCREAS, PITUITARY, PROSTATE, SPINAL CORD, SAL. GLAND MAND, SKIN, SPLEEN, STOMACH, SEMINAL VESICLES, THYMUS, THYROID GLANDS, TRACHEA, URINARY BLADDER, COAGULATING GL

MICRO: TESTES

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL, 2-MILD, 3-MODERATE, 4-SEVERE, P-PRESENT

ANIMAL NO. 97157 GROUP 1:METHYLCELLULOSE MALE SCHEDULED EUTH 11/07/05 DATE OF DEATH: 11/07/05

ORGAN WEIGHT	ABS.(G)	REL.
LIVER	15.2207	3.873
SEM VES/CG/FLUID	1.8444	0.469
PROSTATE	0.7049	0.179
EPIDIDYMIDES	1.0981	0.279
TESTIS, RT	1.7088	0.435
TESTIS, LT	1.6676	0.424
THYROID GLANDS	0.0199	0.005
FINAL BODY WT(G)	393.	

THYROID GLANDS: NO SIGNIFICANT CHANGES OBSERVED

				GRADE
MICRO:	FOLLICULAR EPITHELIAL HEIGHT			3
	BILATERAL			
	COLLOID AREA			2
	BILATERAL			
	CYST, ULTIMOBRANCHIAL			1
	FOCAL, UNILATERAL			

GROSS:	ADRENAL GLANDS	BRAIN	EPIDIDYMIDES	ESOPHAGUS
	EYES	HEART	INTESTINE	KIDNEYS
	LIVER	LYMPH NODE, MES	LUNGS	MAMMARY GLAND
	TESTIS, LT	TESTIS, RT	PANCREAS	PITUITARY
	PROSTATE	SPINAL CORD	SAL. GLAND MAND	SKIN
	SPLEEN	STOMACH	SEMINAL VESICLES	THYMUS
	THYROID GLANDS	TRACHEA	URINARY BLADDER	COAGULATING GL
MICRO:	EPIDIDYMIDES	TESTES		

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL, 2-MILD, 3-MODERATE, 4-SEVERE, P-PRESENT

ANIMAL NO. 97159 GROUP 1:METHYLCELLULOSE MALE SCHEDULED EUTH 11/07/05 DATE OF DEATH: 11/07/05

ORGAN WEIGHT	ABS.(G)	REL.
LIVER	14.9742	3.652
SEM VES/CG/FLUID	1.6902	0.412
PROSTATE	0.9355	0.228
EPIDIDYMIDES	1.1125	0.271
TESTIS, RT	1.6019	0.391
TESTIS, LT	1.6658	0.406
THYROID GLANDS	0.0183	0.004
FINAL BODY WT(G)	410.	

THYROID GLANDS — NO SIGNIFICANT CHANGES OBSERVED

		GRADE
MICRO:	FOLLICULAR EPITHELIAL HEIGHT	
	BILATERAL	3
	COLLOID AREA	
	BILATERAL	2
	CYST, ULTIMOBRANCHIAL	
	FOCAL, UNILATERAL	1
	MITOTIC FIGURES	
	MULTIFOCAL, BILATERAL	1

GROSS: ADRENAL GLANDS, BRAIN, EPIDIDYMIDES, ESOPHAGUS, EYES, HEART, INTESTINE, KIDNEYS, LIVER, LYMPH NODE, MES, LUNGS, MAMMARY GLAND, TESTIS, LT, TESTIS, RT, PANCREAS, PITUITARY, PROSTATE, SPINAL CORD, SAL. GLAND MAND, SKIN, SPLEEN, STOMACH, SEMINAL VESICLES, THYMUS, THYROID GLANDS, TRACHEA, URINARY BLADDER, COAGULATING GL

MICRO: EPIDIDYMIDES, TESTES

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL, 2-MILD, 3-MODERATE, 4-SEVERE, P-PRESENT

ANIMAL NO. 97168 GROUP 1:METHYLCELLULOSE MALE SCHEDULED EUTH 11/07/05 DATE OF DEATH: 11/07/05

ORGAN WEIGHT	ABS.(G)	REL.
LIVER	11.2768	3.438
SEM VES/CG/FLUID	1.4951	0.456
PROSTATE	0.6811	0.208
EPIDIDYMIDES	0.9385	0.286
TESTIS, RT	1.4931	0.455
TESTIS, LT	1.5173	0.463
THYROID GLANDS	0.0221	0.007
FINAL BODY WT(G)	328.	

EPIDIDYMIDES
THYROID GLANDS
NO SIGNIFICANT CHANGES OBSERVED

		GRADE
MICRO:	INFILTRATE, MONONUCLEAR	
	FOCAL	1
MICRO:	FOLLICULAR EPITHELIAL HEIGHT	
	BILATERAL	2
	COLLOID AREA	
	BILATERAL	3
	CYST, ULTIMOBRANCHIAL	
	MULTIFOCAL, BILATERAL	1

GROSS:ADRENAL GLANDS, BRAIN, EPIDIDYMIDES, ESOPHAGUS, EYES, HEART, INTESTINE, KIDNEYS, LIVER, LYMPH NODE, MES, LUNGS, MAMMARY GLAND, TESTIS, LT, TESTIS, RT, PANCREAS, PITUITARY, PROSTATE, SPINAL CORD, SAL. GLAND MAND, SKIN, SPLEEN, STOMACH, SEMINAL VESICLES, THYMUS, THYROID GLANDS, TRACHEA, URINARY BLADDER, COAGULATING GL

MICRO:TESTES

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL, 2-MILD, 3-MODERATE, 4-SEVERE, P-PRESENT

ANIMAL NO. 97172 GROUP 1:METHYLCELLULOSE MALE SCHEDULED EUTH 11/08/05 DATE OF DEATH: 11/08/05

ORGAN WEIGHT	ABS.(G)	REL.
LIVER	13.3372	3.510
SEM VES/CG/FLUID	2.0130	0.530
PROSTATE	0.5738	0.151
EPIDIDYMIDES	1.1155	0.294
TESTIS, RT	1.5096	0.397
TESTIS, LT	1.5359	0.404
THYROID GLANDS	0.0192	0.005
FINAL BODY WT(G)	380.	

		GRADE
EPIDIDYMIDES	MICRO: INFILTRATE, MONONUCLEAR	
	FOCAL	1
THYROID GLANDS	MICRO: FOLLICULAR EPITHELIAL HEIGHT	
	BILATERAL	2
	COLLOID AREA	
	BILATERAL	3
	CYST, ULTIMOBRANCHIAL	
	MULTIFOCAL, BILATERAL	1

NO SIGNIFICANT CHANGES OBSERVED

GROSS:

ADRENAL GLANDS	BRAIN	EPIDIDYMIDES	ESOPHAGUS
EYES	HEART	INTESTINE	KIDNEYS
LIVER	LYMPH NODE, MES	LUNGS	MAMMARY GLAND
TESTIS, LT	TESTIS, RT	PANCREAS	PITUITARY
PROSTATE	SPINAL CORD	SAL. GLAND MAND	SKIN
SPLEEN	STOMACH	SEMINAL VESICLES	THYMUS
THYROID GLANDS	TRACHEA	URINARY BLADDER	COAGULATING GL

MICRO:TESTES

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL, 2-MILD, 3-MODERATE, 4-SEVERE, P-PRESENT

ANIMAL NO. 97192 GROUP 1:METHYLCELLULOSE MALE SCHEDULED EUTH 11/08/05 DATE OF DEATH: 11/08/05

ORGAN WEIGHT	ABS.(G)	REL.
LIVER	16.1395	3.889
SEM VES/CG/FLUID	1.5621	0.376
PROSTATE	0.5845	0.141
EPIDIDYMIDES	0.9083	0.219
TESTIS, RT	1.6234	0.391
TESTIS, LT	1.5908	0.383
THYROID GLANDS	0.0198	0.005
FINAL BODY WT(G)	415.	

THYROID GLANDS — NO SIGNIFICANT CHANGES OBSERVED

				GRADE
MICRO:	FOLLICULAR EPITHELIAL HEIGHT			3
	BILATERAL			
	COLLOID AREA			3
	BILATERAL			
	CYST, ULTIMOBRANCHIAL			1
	FOCAL, UNILATERAL			

GROSS:	ADRENAL GLANDS	BRAIN	EPIDIDYMIDES	ESOPHAGUS
	EYES	HEART	INTESTINE	KIDNEYS
	LIVER	LYMPH NODE, MES	LUNGS	MAMMARY GLAND
	TESTIS, LT	TESTIS, RT	PANCREAS	PITUITARY
	PROSTATE	SPINAL CORD	SAL. GLAND MAND	SKIN
	SPLEEN	STOMACH	SEMINAL VESICLES	THYMUS
	THYROID GLANDS	TRACHEA	URINARY BLADDER	COAGULATING GL
MICRO:	EPIDIDYMIDES	TESTES		

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL, 2-MILD, 3-MODERATE, 4-SEVERE, P-PRESENT

ANIMAL NO. 97198 GROUP 1:METHYLCELLULOSE MALE SCHEDULED EUTH 11/08/05 DATE OF DEATH: 11/08/05

ORGAN WEIGHT	ABS.(G)	REL.
LIVER	14.2392	3.728
SEM VES/CG/FLUID	1.8379	0.481
PROSTATE	0.7401	0.194
EPIDIDYMIDES	0.9936	0.260
TESTIS, RT	1.7415	0.456
TESTIS, LT	1.7759	0.465
THYROID GLANDS	0.0196	0.005
FINAL BODY WT(G)	382.	

EPIDIDYMIDES
NO SIGNIFICANT CHANGES OBSERVED

THYROID GLANDS

		GRADE
MICRO:	INFILTRATE, MONONUCLEAR	
	FOCAL	1
MICRO:	FOLLICULAR EPITHELIAL HEIGHT	
	BILATERAL	2
	COLLOID AREA	
	BILATERAL	2
	CYST, ULTIMOBRANCHIAL	
	MULTIFOCAL, UNILATERAL	1

GROSS: ADRENAL GLANDS, BRAIN, EPIDIDYMIDES, ESOPHAGUS, EYES, HEART, INTESTINE, KIDNEYS, LIVER, LYMPH NODE, MES, LUNGS, MAMMARY GLAND, TESTIS, LT, TESTIS, RT, PANCREAS, PITUITARY, PROSTATE, SPINAL CORD, SAL. GLAND MAND, SKIN, SPLEEN, STOMACH, SEMINAL VESICLES, THYMUS, THYROID GLANDS, TRACHEA, URINARY BLADDER, COAGULATING GL

MICRO: TESTES

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL, 2-MILD, 3-MODERATE, 4-SEVERE, P-PRESENT

ANIMAL NO. 97200 GROUP 1:METHYLCELLULOSE MALE SCHEDULED EUTH 11/08/05 DATE OF DEATH: 11/08/05

ORGAN WEIGHT	ABS.(G)	REL.
LIVER	14.5793	3.729
SEM VES/CG/FLUID	1.2438	0.318
PROSTATE	0.5745	0.147
EPIDIDYMIDES	0.9756	0.250
TESTIS, RT	1.5756	0.403
TESTIS, LT	1.5105	0.386
THYROID GLANDS	0.0210	0.005
FINAL BODY WT(G)	391.	

NO SIGNIFICANT CHANGES OBSERVED

		GRADE
EPIDIDYMIDES	MICRO: INFILTRATE, MONONUCLEAR	
	FOCAL	1
THYROID GLANDS	MICRO: FOLLICULAR EPITHELIAL HEIGHT	
	BILATERAL	2
	COLLOID AREA	
	BILATERAL	3
	CYST, ULTIMOBRANCHIAL	
	MULTIFOCAL, UNILATERAL	1

GROSS:ADRENAL GLANDS, BRAIN, EPIDIDYMIDES, ESOPHAGUS, EYES, HEART, INTESTINE, KIDNEYS, LIVER, LYMPH NODE, MES, LUNGS, MAMMARY GLAND, TESTIS, LT, TESTIS, RT, PANCREAS, PITUITARY, PROSTATE, SPINAL CORD, SAL. GLAND MAND, SKIN, SPLEEN, STOMACH, SEMINAL VESICLES, THYMUS, THYROID GLANDS, TRACHEA, URINARY BLADDER, COAGULATING GL

MICRO:TESTES

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL, 2-MILD, 3-MODERATE, 4-SEVERE, P-PRESENT

ANIMAL NO. 97205 GROUP 1:METHYLCELLULOSE MALE SCHEDULED EUTH 11/08/05 DATE OF DEATH: 11/08/05

ORGAN WEIGHT	ABS.(G)	REL.
LIVER	13.0971	3.447
SEM VES/CG/FLUID	1.4337	0.377
PROSTATE	0.7684	0.202
EPIDIDYMIDES	0.8932	0.235
TESTIS, RT	1.6841	0.443
TESTIS, LT	1.6893	0.445
THYROID GLANDS	0.0174	0.005
FINAL BODY WT(G)	380.	

NO SIGNIFICANT CHANGES OBSERVED

			GRADE
EPIDIDYMIDES	MICRO: INFILTRATE, MONONUCLEAR		1
	MULTIFOCAL		
THYROID GLANDS	MICRO: FOLLICULAR EPITHELIAL HEIGHT		3
	BILATERAL		
	COLLOID AREA		2
	BILATERAL		
	MITOTIC FIGURES		1
	MULTIFOCAL, BILATERAL		

GROSS:

ADRENAL GLANDS	BRAIN	EPIDIDYMIDES	ESOPHAGUS
EYES	HEART	INTESTINE	KIDNEYS
LIVER	LYMPH NODE, MES	LUNGS	MAMMARY GLAND
TESTIS, LT	TESTIS, RT	PANCREAS	PITUITARY
PROSTATE	SPINAL CORD	SAL. GLAND MAND	SKIN
SPLEEN	STOMACH	SEMINAL VESICLES	THYMUS
THYROID GLANDS	TRACHEA	URINARY BLADDER	COAGULATING GL

MICRO:TESTES

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL, 2-MILD, 3-MODERATE, 4-SEVERE, P-PRESENT

ANIMAL NO. 97212 GROUP 1:METHYLCELLULOSE MALE SCHEDULED EUTH 11/09/05 DATE OF DEATH: 11/09/05

ORGAN WEIGHT	ABS.(G)	REL.
LIVER	15.1968	3.510
SEM VES/CG/FLUID	1.4485	0.335
PROSTATE	0.7297	0.169
EPIDIDYMIDES	1.1528	0.266
TESTIS, RT	1.7606	0.407
TESTIS, LT	1.7351	0.401
THYROID GLANDS	0.0266	0.006
FINAL BODY WT(G)	433.	

		GRADE
EPIDIDYMIDES	MICRO: INFILTRATE, MONONUCLEAR	
	MULTIFOCAL	1
THYROID GLANDS	MICRO: FOLLICULAR EPITHELIAL HEIGHT	
	BILATERAL	2
	COLLOID AREA	
	BILATERAL	3
	CYST, ULTIMOBRANCHIAL	
	FOCAL, UNILATERAL	1
	MITOTIC FIGURES	
	MULTIFOCAL, BILATERAL	1

NO SIGNIFICANT CHANGES OBSERVED

GROSS:

ADRENAL GLANDS	BRAIN	EPIDIDYMIDES	ESOPHAGUS
EYES	HEART	INTESTINE	KIDNEYS
LIVER	LYMPH NODE, MES	LUNGS	MAMMARY GLAND
TESTIS, LT	TESTIS, RT	PANCREAS	PITUITARY
PROSTATE	SPINAL CORD	SAL. GLAND MAND	SKIN
SPLEEN	STOMACH	SEMINAL VESICLES	THYMUS
THYROID GLANDS	TRACHEA	URINARY BLADDER	COAGULATING GL

MICRO:TESTES

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL, 2-MILD, 3-MODERATE, 4-SEVERE, P-PRESENT

ANIMAL NO. 97213 GROUP 1:METHYLCELLULOSE MALE SCHEDULED EUTH 11/09/05 DATE OF DEATH: 11/09/05

ORGAN WEIGHT	ABS.(G)	REL.
LIVER	16.2617	4.148
SEM VES/CG/FLUID	1.6266	0.415
PROSTATE	0.7976	0.203
EPIDIDYMIDES	0.8482	0.216
TESTIS, RT	1.7551	0.448
TESTIS, LT	1.7140	0.437
THYROID GLANDS	0.0224	0.006
FINAL BODY WT(G)	392.	

		GRADE
EPIDIDYMIDES	MICRO: INFILTRATE, MONONUCLEAR MULTIFOCAL	1
THYROID GLANDS	MICRO: FOLLICULAR EPITHELIAL HEIGHT BILATERAL	3
	COLLOID AREA BILATERAL	3
	CYST, ULTIMOBRANCHIAL MULTIFOCAL, BILATERAL	1
	MITOTIC FIGURES MULTIFOCAL, BILATERAL	1

NO SIGNIFICANT CHANGES OBSERVED

GROSS: ADRENAL GLANDS, BRAIN, EPIDIDYMIDES, ESOPHAGUS, EYES, HEART, INTESTINE, KIDNEYS, LIVER, LYMPH NODE, MES, LUNGS, MAMMARY GLAND, TESTIS, LT, TESTIS, RT, PANCREAS, PITUITARY, PROSTATE, SPINAL CORD, SAL. GLAND MAND, SKIN, SPLEEN, STOMACH, SEMINAL VESICLES, THYMUS, THYROID GLANDS, TRACHEA, URINARY BLADDER, COAGULATING GL

MICRO: TESTES

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL, 2-MILD, 3-MODERATE, 4-SEVERE, P-PRESENT

ANIMAL NO. 97226 GROUP 1:METHYLCELLULOSE MALE SCHEDULED EUTH 11/09/05 DATE OF DEATH: 11/09/05

ORGAN WEIGHT	ABS.(G)	REL.
LIVER	14.0987	3.551
SEM VES/CG/FLUID	1.4634	0.369
PROSTATE	0.9720	0.245
EPIDIDYMIDES	0.9726	0.245
TESTIS, RT	1.8151	0.457
TESTIS, LT	1.8523	0.467
THYROID GLANDS	0.0207	0.005
FINAL BODY WT(G)	397.	

NO SIGNIFICANT CHANGES OBSERVED

		GRADE
EPIDIDYMIDES	MICRO: INFILTRATE, MONONUCLEAR	1
	MULTIFOCAL	
THYROID GLANDS	MICRO: FOLLICULAR EPITHELIAL HEIGHT	3
	BILATERAL	
	COLLOID AREA	2
	BILATERAL	
TESTES	MICRO: DEGENERATION, SEMINIFEROUS TUBULES	1
	MULTIFOCAL, BILATERAL	

GROSS:

ADRENAL GLANDS	BRAIN	EPIDIDYMIDES	ESOPHAGUS
EYES	HEART	INTESTINE	KIDNEYS
LIVER	LYMPH NODE, MES	LUNGS	MAMMARY GLAND
TESTIS, LT	TESTIS, RT	PANCREAS	PITUITARY
PROSTATE	SPINAL CORD	SAL. GLAND MAND	SKIN
SPLEEN	STOMACH	SEMINAL VESICLES	THYMUS
THYROID GLANDS	TRACHEA	URINARY BLADDER	COAGULATING GL

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL, 2-MILD, 3-MODERATE, 4-SEVERE, P-PRESENT

ANIMAL NO. 97227 GROUP 1:METHYLCELLULOSE MALE SCHEDULED EUTH 11/09/05 DATE OF DEATH: 11/09/05

ORGAN WEIGHT	ABS.(G)	REL.
LIVER	15.2440	3.830
SEM VES/CG/FLUID	1.9755	0.496
PROSTATE	0.8992	0.226
EPIDIDYMIDES	1.0746	0.270
TESTIS, RT	1.7403	0.437
TESTIS, LT	1.6867	0.424
THYROID GLANDS	0.0177	0.004
FINAL BODY WT(G)	398.	

		GRADE
EPIDIDYMIDES	MICRO: INFILTRATE, MONONUCLEAR	
	FOCAL	1
THYROID GLANDS	MICRO: FOLLICULAR EPITHELIAL HEIGHT	
	BILATERAL	3
	COLLOID AREA	
	BILATERAL	2
	CYST, ULTIMOBRANCHIAL	
	FOCAL, UNILATERAL	1

NO SIGNIFICANT CHANGES OBSERVED

GROSS:

ADRENAL GLANDS	BRAIN	EPIDIDYMIDES	ESOPHAGUS
EYES	HEART	INTESTINE	KIDNEYS
LIVER	LYMPH NODE, MES	LUNGS	MAMMARY GLAND
TESTIS, LT	TESTIS, RT	PANCREAS	PITUITARY
PROSTATE	SPINAL CORD	SAL. GLAND MAND	SKIN
SPLEEN	STOMACH	SEMINAL VESICLES	THYMUS
THYROID GLANDS	TRACHEA	URINARY BLADDER	COAGULATING GL

MICRO:TESTES

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL, 2-MILD, 3-MODERATE, 4-SEVERE, P-PRESENT

ANIMAL NO. 97237 GROUP 1:METHYLCELLULOSE MALE SCHEDULED EUTH 11/09/05 DATE OF DEATH: 11/09/05

ORGAN WEIGHT	ABS.(G)	REL.
LIVER	12.7062	3.335
SEM VES/CG/FLUID	1.7956	0.471
PROSTATE	0.8928	0.234
EPIDIDYMIDES	1.1388	0.299
TESTIS, RT	1.6524	0.434
TESTIS, LT	1.6303	0.428
THYROID GLANDS	0.0227	0.006
FINAL BODY WT(G)	381.	

		GRADE
EPIDIDYMIDES	MICRO: INFILTRATE, MONONUCLEAR	
	FOCAL	1
THYROID GLANDS	MICRO: FOLLICULAR EPITHELIAL HEIGHT	
	BILATERAL	3
	COLLOID AREA	
	BILATERAL	3
	CYST, ULTIMOBRANCHIAL	
	FOCAL, UNILATERAL	1

NO SIGNIFICANT CHANGES OBSERVED

GROSS:

ADRENAL GLANDS	BRAIN	EPIDIDYMIDES	ESOPHAGUS
EYES	HEART	INTESTINE	KIDNEYS
LIVER	LYMPH NODE, MES	LUNGS	MAMMARY GLAND
TESTIS, LT	TESTIS, RT	PANCREAS	PITUITARY
PROSTATE	SPINAL CORD	SAL. GLAND MAND	SKIN
SPLEEN	STOMACH	SEMINAL VESICLES	THYMUS
THYROID GLANDS	TRACHEA	URINARY BLADDER	COAGULATING GL

MICRO:TESTES

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL, 2-MILD, 3-MODERATE, 4-SEVERE, P-PRESENT

SCHEDULED EUTHANASIA

PROJECT NO.:WIL-431014 INTER-LAB 15-DAY MALE RAT ASSAY WITH LINURON & PHENOBARBITAL

SPONSOR:BATTELLE INDIVIDUAL MACROSCOPIC AND MICROSCOPIC FINDINGS

SPONSOR NO.:68-W-01-023

ANIMAL NO. 97122 GROUP 2: 50 MG LINURON MALE SCHEDULED EUTH 11/07/05 DATE OF DEATH: 11/07/05

ORGAN WEIGHT	ABS.(G)	REL.	GRADE
LIVER	14.4254	4.018	
SEM VES/CG/FLUID	1.1039	0.307	
PROSTATE	0.3743	0.104	
EPIDIDYMIDES	0.9705	0.270	
TESTIS, RT	1.9213	0.535	
TESTIS, LT	1.8794	0.524	
THYROID GLANDS	0.0172	0.005	
FINAL BODY WT(G)	359.		

NO SIGNIFICANT CHANGES OBSERVED

GROSS:

ADRENAL GLANDS	BRAIN	EPIDIDYMIDES	ESOPHAGUS
EYES	HEART	INTESTINE	KIDNEYS
LIVER	LYMPH NODE, MES	LUNGS	MAMMARY GLAND
TESTIS, LT	TESTIS, RT	PANCREAS	PITUITARY
PROSTATE	SPINAL CORD	SAL. GLAND MAND	SKIN
SPLEEN	STOMACH	SEMINAL VESICLES	THYMUS
THYROID GLANDS	TRACHEA	URINARY BLADDER	COAGULATING GL

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL, 2-MILD, 3-MODERATE, 4-SEVERE, P-PRESENT

SCHEDULED EUTHANASIA

PROJECT NO.:WIL-431014 INTER-LAB 15-DAY MALE RAT ASSAY WITH LINURON & PHENOBARBITAL PAGE 17

SPONSOR:BATTELLE INDIVIDUAL MACROSCOPIC AND MICROSCOPIC FINDINGS

SPONSOR NO.:68-W-01-023

ANIMAL NO. 97124 GROUP 2: 50 MG LINURON MALE SCHEDULED EUTH 11/07/05 DATE OF DEATH: 11/07/05

ORGAN WEIGHT	ABS.(G)	REL.	GRADE
LIVER	14.0969	4.311	
SEM VES/CG/FLUID	1.8284	0.559	
PROSTATE	0.6382	0.195	
EPIDIDYMIDES	1.0376	0.317	
TESTIS, RT	1.5671	0.479	
TESTIS, LT	1.5761	0.482	
THYROID GLANDS	0.0180	0.006	
FINAL BODY WT(G)	327.		

NO SIGNIFICANT CHANGES OBSERVED

GROSS:

ADRENAL GLANDS	BRAIN	EPIDIDYMIDES	ESOPHAGUS
EYES	HEART	INTESTINE	KIDNEYS
LIVER	LYMPH NODE, MES	LUNGS	MAMMARY GLAND
TESTIS, LT	TESTIS, RT	PANCREAS	PITUITARY
PROSTATE	SPINAL CORD	SAL. GLAND MAND	SKIN
SPLEEN	STOMACH	SEMINAL VESICLES	THYMUS
THYROID GLANDS	TRACHEA	URINARY BLADDER	COAGULATING GL

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL, 2-MILD, 3-MODERATE, 4-SEVERE, P-PRESENT

ANIMAL NO. 97125 GROUP 2: 50 MG LINURON MALE SCHEDULED EUTH 11/07/05 DATE OF DEATH: 11/07/05

ORGAN WEIGHT	ABS.(G)	REL.	GRADE
LIVER	10.5358	3.212	
SEM VES/CG/FLUID	1.5549	0.474	
PROSTATE	0.7243	0.221	
EPIDIDYMIDES	0.9352	0.285	
TESTIS, RT	1.5587	0.475	
TESTIS, LT	1.5639	0.477	
THYROID GLANDS	0.0165	0.005	
FINAL BODY WT(G)	328.		

NO SIGNIFICANT CHANGES OBSERVED

GROSS:

ADRENAL GLANDS	BRAIN	EPIDIDYMIDES	ESOPHAGUS
EYES	HEART	INTESTINE	KIDNEYS
LIVER	LYMPH NODE, MES	LUNGS	MAMMARY GLAND
TESTIS, LT	TESTIS, RT	PANCREAS	PITUITARY
PROSTATE	SPINAL CORD	SAL. GLAND MAND	SKIN
SPLEEN	STOMACH	SEMINAL VESICLES	THYMUS
THYROID GLANDS	TRACHEA	URINARY BLADDER	COAGULATING GL

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL, 2-MILD, 3-MODERATE, 4-SEVERE, P-PRESENT

SCHEDULED EUTHANASIA

PROJECT NO.:WIL-431014 INTER-LAB 15-DAY MALE RAT ASSAY WITH LINURON & PHENOBARBITAL
SPONSOR:BATTELLE INDIVIDUAL MACROSCOPIC AND MICROSCOPIC FINDINGS
SPONSOR NO.:68-W-01-023

ANIMAL NO. 97137 GROUP 2: 50 MG LINURON MALE SCHEDULED EUTH 11/07/05 DATE OF DEATH: 11/07/05

ORGAN WEIGHT	ABS.(G)	REL.	NO SIGNIFICANT CHANGES OBSERVED	GRADE
LIVER	13.3232	3.953		
SEM VES/CG/FLUID	1.5560	0.462		
PROSTATE	0.6678	0.198		
EPIDIDYMIDES	1.0113	0.300		
TESTIS, RT	1.8230	0.541		
TESTIS, LT	1.7513	0.520		
THYROID GLANDS	0.0182	0.005		
FINAL BODY WT(G)	337.			

GROSS:				
ADRENAL GLANDS	BRAIN	EPIDIDYMIDES	ESOPHAGUS	
EYES	HEART	INTESTINE	KIDNEYS	
LIVER	LYMPH NODE, MES	LUNGS	MAMMARY GLAND	
TESTIS, LT	TESTIS, RT	PANCREAS	PITUITARY	
PROSTATE	SPINAL CORD	SAL. GLAND MAND	SKIN	
SPLEEN	STOMACH	SEMINAL VESICLES	THYMUS	
THYROID GLANDS	TRACHEA	URINARY BLADDER	COAGULATING GL	

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL, 2-MILD, 3-MODERATE, 4-SEVERE, P-PRESENT

SCHEDULED EUTHANASIA

PROJECT NO.:WIL-431014 INTER-LAB 15-DAY MALE RAT ASSAY WITH LINURON & PHENOBARBITAL
SPONSOR:BATTELLE INDIVIDUAL MACROSCOPIC AND MICROSCOPIC FINDINGS
SPONSOR NO.:68-W-01-023

ANIMAL NO. 97138 GROUP 2: 50 MG LINURON MALE SCHEDULED EUTH 11/07/05 DATE OF DEATH: 11/07/05

ORGAN WEIGHT	ABS.(G)	REL.	NO SIGNIFICANT CHANGES OBSERVED	GRADE
LIVER	13.3391	3.889		
SEM VES/CG/FLUID	1.5532	0.453		
PROSTATE	0.5843	0.170		
EPIDIDYMIDES	0.9504	0.277		
TESTIS, RT	1.6240	0.473		
TESTIS, LT	1.6600	0.484		
THYROID GLANDS	0.0145	0.004		
FINAL BODY WT(G)	343.			

GROSS:				
ADRENAL GLANDS	BRAIN	EPIDIDYMIDES	ESOPHAGUS	
EYES	HEART	INTESTINE	KIDNEYS	
LIVER	LYMPH NODE, MES	LUNGS	MAMMARY GLAND	
TESTIS, LT	TESTIS, RT	PANCREAS	PITUITARY	
PROSTATE	SPINAL CORD	SAL. GLAND MAND	SKIN	
SPLEEN	STOMACH	SEMINAL VESICLES	THYMUS	
THYROID GLANDS	TRACHEA	URINARY BLADDER	COAGULATING GL	

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL, 2-MILD, 3-MODERATE, 4-SEVERE, P-PRESENT

SCHEDULED EUTHANASIA

PROJECT NO.:WIL-431014 INTER-LAB 15-DAY MALE RAT ASSAY WITH LINURON & PHENOBARBITAL

SPONSOR:BATTELLE INDIVIDUAL MACROSCOPIC AND MICROSCOPIC FINDINGS

SPONSOR NO.:68-W-01-023

ANIMAL NO. 97165 GROUP 2: 50 MG LINURON MALE SCHEDULED EUTH 11/08/05 DATE OF DEATH: 11/08/05

ORGAN WEIGHT	ABS.(G)	REL.	GRADE
LIVER	12.5968	3.630	NO SIGNIFICANT CHANGES OBSERVED
SEM VES/CG/FLUID	1.5686	0.452	
PROSTATE	0.8924	0.257	
EPIDIDYMIDES	1.0679	0.308	
TESTIS, RT	1.7710	0.510	
TESTIS, LT	1.8005	0.519	
THYROID GLANDS	0.0194	0.006	
FINAL BODY WT(G)	347.		

GROSS:

ADRENAL GLANDS	BRAIN	EPIDIDYMIDES	ESOPHAGUS
EYES	HEART	INTESTINE	KIDNEYS
LIVER	LYMPH NODE, MES	LUNGS	MAMMARY GLAND
TESTIS, LT	TESTIS, RT	PANCREAS	PITUITARY
PROSTATE	SPINAL CORD	SAL. GLAND MAND	SKIN
SPLEEN	STOMACH	SEMINAL VESICLES	THYMUS
THYROID GLANDS	TRACHEA	URINARY BLADDER	COAGULATING GL

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL, 2-MILD, 3-MODERATE, 4-SEVERE, P-PRESENT

SCHEDULED EUTHANASIA

PROJECT NO.:WIL-431014 INTER-LAB 15-DAY MALE RAT ASSAY WITH LINURON & PHENOBARBITAL
SPONSOR:BATTELLE INDIVIDUAL MACROSCOPIC AND MICROSCOPIC FINDINGS
SPONSOR NO.:68-W-01-023

ANIMAL NO. 97176 GROUP 2: 50 MG LINURON MALE SCHEDULED EUTH 11/08/05 DATE OF DEATH: 11/08/05

ORGAN WEIGHT	ABS.(G)	REL.						GRADE
LIVER	12.4638	3.883	SEMINAL VESICLES	GROSS: SMALL				P
SEM VES/CG/FLUID	0.9652	0.301		BILATERAL				
PROSTATE	0.7123	0.222	NO SIGNIFICANT					
EPIDIDYMIDES	0.9717	0.303	CHANGES OBSERVED	GROSS: ADRENAL GLANDS	BRAIN	EPIDIDYMIDES	ESOPHAGUS	
TESTIS, RT	1.6430	0.512		EYES	HEART	INTESTINE	KIDNEYS	
TESTIS, LT	1.5984	0.498		LIVER	LYMPH NODE, MES	LUNGS	MAMMARY GLAND	
THYROID GLANDS	0.0222	0.007		TESTIS, LT	TESTIS, RT	PANCREAS	PITUITARY	
FINAL BODY WT(G)	321.			PROSTATE	SPINAL CORD	SAL. GLAND MAND	SKIN	
				SPLEEN	STOMACH	THYMUS	THYROID GLANDS	
				TRACHEA	URINARY BLADDER	COAGULATING GL		

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL, 2-MILD, 3-MODERATE, 4-SEVERE, P-PRESENT

ANIMAL NO. 97189 GROUP 2: 50 MG LINURON MALE SCHEDULED EUTH 11/08/05 DATE OF DEATH: 11/08/05

ORGAN WEIGHT	ABS.(G)	REL.	GRADE
LIVER	14.6307	3.997	
SEM VES/CG/FLUID	1.4216	0.388	
PROSTATE	0.7805	0.213	
EPIDIDYMIDES	0.9808	0.268	
TESTIS, RT	1.4604	0.399	
TESTIS, LT	1.4948	0.408	
THYROID GLANDS	0.0252	0.007	
FINAL BODY WT(G)	366.		

NO SIGNIFICANT CHANGES OBSERVED

GROSS:

ADRENAL GLANDS	BRAIN	EPIDIDYMIDES	ESOPHAGUS
EYES	HEART	INTESTINE	KIDNEYS
LIVER	LYMPH NODE, MES	LUNGS	MAMMARY GLAND
TESTIS, LT	TESTIS, RT	PANCREAS	PITUITARY
PROSTATE	SPINAL CORD	SAL. GLAND MAND	SKIN
SPLEEN	STOMACH	SEMINAL VESICLES	THYMUS
THYROID GLANDS	TRACHEA	URINARY BLADDER	COAGULATING GL

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL, 2-MILD, 3-MODERATE, 4-SEVERE, P-PRESENT

ANIMAL NO. 97197 GROUP 2: 50 MG LINURON MALE SCHEDULED EUTH 11/08/05 DATE OF DEATH: 11/08/05

ORGAN WEIGHT	ABS.(G)	REL.	GRADE
LIVER	13.0421	4.101	
SEM VES/CG/FLUID	1.2420	0.391	
PROSTATE	0.5909	0.186	
EPIDIDYMIDES	0.8986	0.283	
TESTIS, RT	1.7430	0.548	
TESTIS, LT	1.6722	0.526	
THYROID GLANDS	0.0204	0.006	
FINAL BODY WT(G)	318.		

NO SIGNIFICANT CHANGES OBSERVED

GROSS:

ADRENAL GLANDS	BRAIN	EPIDIDYMIDES	ESOPHAGUS
EYES	HEART	INTESTINE	KIDNEYS
LIVER	LYMPH NODE, MES	LUNGS	MAMMARY GLAND
TESTIS, LT	TESTIS, RT	PANCREAS	PITUITARY
PROSTATE	SPINAL CORD	SAL. GLAND MAND	SKIN
SPLEEN	STOMACH	SEMINAL VESICLES	THYMUS
THYROID GLANDS	TRACHEA	URINARY BLADDER	COAGULATING GL

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL, 2-MILD, 3-MODERATE, 4-SEVERE, P-PRESENT

ANIMAL NO. 97199 GROUP 2: 50 MG LINURON MALE SCHEDULED EUTH 11/08/05 DATE OF DEATH: 11/08/05

ORGAN WEIGHT	ABS.(G)	REL.	GRADE
LIVER	16.7145	4.341	NO SIGNIFICANT CHANGES OBSERVED
SEM VES/CG/FLUID	1.6940	0.440	
PROSTATE	0.5568	0.145	
EPIDIDYMIDES	0.9825	0.255	
TESTIS, RT	2.0049	0.521	
TESTIS, LT	2.0423	0.530	
THYROID GLANDS	0.0214	0.006	
FINAL BODY WT(G)	385.		

GROSS:

ADRENAL GLANDS	BRAIN	EPIDIDYMIDES	ESOPHAGUS
EYES	HEART	INTESTINE	KIDNEYS
LIVER	LYMPH NODE, MES	LUNGS	MAMMARY GLAND
TESTIS, LT	TESTIS, RT	PANCREAS	PITUITARY
PROSTATE	SPINAL CORD	SAL. GLAND MAND	SKIN
SPLEEN	STOMACH	SEMINAL VESICLES	THYMUS
THYROID GLANDS	TRACHEA	URINARY BLADDER	COAGULATING GL

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL, 2-MILD, 3-MODERATE, 4-SEVERE, P-PRESENT

ANIMAL NO. 97206 GROUP 2: 50 MG LINURON MALE SCHEDULED EUTH 11/09/05 DATE OF DEATH: 11/09/05

ORGAN WEIGHT	ABS.(G)	REL.			GRADE
LIVER	15.7944	4.269	SEMINAL VESICLES	GROSS: SMALL	P
				BILATERAL	
SEM VES/CG/FLUID	1.1097	0.300	COAGULATING GL	GROSS: ENLARGED	P
PROSTATE	0.4876	0.132		RIGHT	
EPIDIDYMIDES	0.9211	0.249	NO SIGNIFICANT		
TESTIS, RT	1.7640	0.477	CHANGES OBSERVED		
TESTIS, LT	1.8376	0.497			
THYROID GLANDS	0.0229	0.006			
FINAL BODY WT(G)	370.				

GROSS: ADRENAL GLANDS, BRAIN, EPIDIDYMIDES, ESOPHAGUS, EYES, HEART, INTESTINE, KIDNEYS, LIVER, LYMPH NODE, MES, LUNGS, MAMMARY GLAND, TESTIS, LT, TESTIS, RT, PANCREAS, PITUITARY, PROSTATE, SPINAL CORD, SAL. GLAND MAND, SKIN, SPLEEN, STOMACH, THYMUS, THYROID GLANDS, TRACHEA, URINARY BLADDER

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL, 2-MILD, 3-MODERATE, 4-SEVERE, P-PRESENT

SCHEDULED EUTHANASIA

PROJECT NO.:WIL-431014 INTER-LAB 15-DAY MALE RAT ASSAY WITH LINURON & PHENOBARBITAL

SPONSOR:BATTELLE INDIVIDUAL MACROSCOPIC AND MICROSCOPIC FINDINGS

SPONSOR NO.:68-W-01-023

ANIMAL NO. 97210 GROUP 2: 50 MG LINURON MALE SCHEDULED EUTH 11/09/05 DATE OF DEATH: 11/09/05

ORGAN WEIGHT	ABS.(G)	REL.	GRADE
LIVER	16.6592	4.787	NO SIGNIFICANT CHANGES OBSERVED
SEM VES/CG/FLUID	1.4197	0.408	
PROSTATE	0.5593	0.161	
EPIDIDYMIDES	0.9663	0.278	
TESTIS, RT	1.6764	0.482	
TESTIS, LT	1.6471	0.473	
THYROID GLANDS	0.0215	0.006	
FINAL BODY WT(G)	348.		

GROSS:

ADRENAL GLANDS	BRAIN	EPIDIDYMIDES	ESOPHAGUS
EYES	HEART	INTESTINE	KIDNEYS
LIVER	LYMPH NODE, MES	LUNGS	MAMMARY GLAND
TESTIS, LT	TESTIS, RT	PANCREAS	PITUITARY
PROSTATE	SPINAL CORD	SAL. GLAND MAND	SKIN
SPLEEN	STOMACH	SEMINAL VESICLES	THYMUS
THYROID GLANDS	TRACHEA	URINARY BLADDER	COAGULATING GL

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL, 2-MILD, 3-MODERATE, 4-SEVERE, P-PRESENT

ANIMAL NO. 97217 GROUP 2: 50 MG LINURON MALE SCHEDULED EUTH 11/09/05 DATE OF DEATH: 11/09/05

ORGAN WEIGHT	ABS.(G)	REL.	GRADE
LIVER	13.4197	3.759	
SEM VES/CG/FLUID	1.3626	0.382	
PROSTATE	0.6212	0.174	
EPIDIDYMIDES	0.8999	0.252	
TESTIS, RT	1.6421	0.460	
TESTIS, LT	1.7311	0.485	
THYROID GLANDS	0.0174	0.005	
FINAL BODY WT(G)	357.		

NO SIGNIFICANT CHANGES OBSERVED

GROSS:

ADRENAL GLANDS	BRAIN	EPIDIDYMIDES	ESOPHAGUS
EYES	HEART	INTESTINE	KIDNEYS
LIVER	LYMPH NODE, MES	LUNGS	MAMMARY GLAND
TESTIS, LT	TESTIS, RT	PANCREAS	PITUITARY
PROSTATE	SPINAL CORD	SAL. GLAND MAND	SKIN
SPLEEN	STOMACH	SEMINAL VESICLES	THYMUS
THYROID GLANDS	TRACHEA	URINARY BLADDER	COAGULATING GL

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL, 2-MILD, 3-MODERATE, 4-SEVERE, P-PRESENT

ANIMAL NO. 97221 GROUP 2: 50 MG LINURON MALE SCHEDULED EUTH 11/09/05 DATE OF DEATH: 11/09/05

ORGAN WEIGHT	ABS.(G)	REL.	GRADE
LIVER	15.4026	4.043	
SEM VES/CG/FLUID	1.1904	0.312	
PROSTATE	0.5899	0.155	
EPIDIDYMIDES	0.9324	0.245	
TESTIS, RT	1.5226	0.400	
TESTIS, LT	1.5093	0.396	
THYROID GLANDS	0.0192	0.005	
FINAL BODY WT(G)	381.		

NO SIGNIFICANT CHANGES OBSERVED

GROSS:

ADRENAL GLANDS	BRAIN	EPIDIDYMIDES	ESOPHAGUS
EYES	HEART	INTESTINE	KIDNEYS
LIVER	LYMPH NODE, MES	LUNGS	MAMMARY GLAND
TESTIS, LT	TESTIS, RT	PANCREAS	PITUITARY
PROSTATE	SPINAL CORD	SAL. GLAND MAND	SKIN
SPLEEN	STOMACH	SEMINAL VESICLES	THYMUS
THYROID GLANDS	TRACHEA	URINARY BLADDER	COAGULATING GL

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL, 2-MILD, 3-MODERATE, 4-SEVERE, P-PRESENT

ANIMAL NO. 97236 GROUP 2: 50 MG LINURON MALE SCHEDULED EUTH 11/09/05 DATE OF DEATH: 11/09/05

ORGAN WEIGHT	ABS.(G)	REL.	GENERAL COMMENT	GRADE
LIVER	14.0118	4.015		P
SEM VES/CG/FLUID	0.8988	0.258	NO SIGNIFICANT	
PROSTATE	0.8107	0.232	CHANGES OBSERVED	
EPIDIDYMIDES	0.9800	0.281		
TESTIS, RT	1.5821	0.453		
TESTIS, LT	1.5702	0.450		
THYROID GLANDS	0.0276	0.008		
FINAL BODY WT(G)	349.			

GROSS: ORGAN DAMAGED AT NECROPSY
SEMINAL FLUID LOST PRIOR TO WEIGHING

GROSS:

ADRENAL GLANDS	BRAIN	EPIDIDYMIDES	ESOPHAGUS
EYES	HEART	INTESTINE	KIDNEYS
LIVER	LYMPH NODE, MES	LUNGS	MAMMARY GLAND
TESTIS, LT	TESTIS, RT	PANCREAS	PITUITARY
PROSTATE	SPINAL CORD	SAL. GLAND MAND	SKIN
SPLEEN	STOMACH	SEMINAL VESICLES	THYMUS
THYROID GLANDS	TRACHEA	URINARY BLADDER	COAGULATING GL

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL, 2-MILD, 3-MODERATE, 4-SEVERE, P-PRESENT

ANIMAL NO. 97119 GROUP 3: 100 MG LINURON MALE SCHEDULED EUTH 11/07/05 DATE OF DEATH: 11/07/05

ORGAN WEIGHT	ABS.(G)	REL.	GRADE
LIVER	11.7150	3.944	
SEM VES/CG/FLUID	1.4139	0.476	
PROSTATE	0.4659	0.157	
EPIDIDYMIDES	0.8762	0.295	
TESTIS, RT	1.5647	0.527	
TESTIS, LT	1.6727	0.563	
THYROID GLANDS	0.0151	0.005	
FINAL BODY WT(G)	297.		

NO SIGNIFICANT CHANGES OBSERVED

GROSS:				
ADRENAL GLANDS	BRAIN	EPIDIDYMIDES	ESOPHAGUS	
EYES	HEART	INTESTINE	KIDNEYS	
LIVER	LYMPH NODE, MES	LUNGS	MAMMARY GLAND	
TESTIS, LT	TESTIS, RT	PANCREAS	PITUITARY	
PROSTATE	SPINAL CORD	SAL. GLAND MAND	SKIN	
SPLEEN	STOMACH	SEMINAL VESICLES	THYMUS	
THYROID GLANDS	TRACHEA	URINARY BLADDER	COAGULATING GL	

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL, 2-MILD, 3-MODERATE, 4-SEVERE, P-PRESENT

ANIMAL NO. 97132 GROUP 3: 100 MG LINURON MALE SCHEDULED EUTH 11/07/05 DATE OF DEATH: 11/07/05

ORGAN WEIGHT	ABS.(G)	REL.	GRADE
LIVER	11.3047	3.981	
SEM VES/CG/FLUID	1.2040	0.424	
PROSTATE	0.5272	0.186	
EPIDIDYMIDES	0.8932	0.315	
TESTIS, RT	1.6500	0.581	
TESTIS, LT	1.5640	0.551	
THYROID GLANDS	0.0147	0.005	
FINAL BODY WT(G)	284.		

NO SIGNIFICANT CHANGES OBSERVED

GROSS:

ADRENAL GLANDS	BRAIN	EPIDIDYMIDES	ESOPHAGUS
EYES	HEART	INTESTINE	KIDNEYS
LIVER	LYMPH NODE, MES	LUNGS	MAMMARY GLAND
TESTIS, LT	TESTIS, RT	PANCREAS	PITUITARY
PROSTATE	SPINAL CORD	SAL. GLAND MAND	SKIN
SPLEEN	STOMACH	SEMINAL VESICLES	THYMUS
THYROID GLANDS	TRACHEA	URINARY BLADDER	COAGULATING GL

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL, 2-MILD, 3-MODERATE, 4-SEVERE, P-PRESENT

ANIMAL NO. 97148 GROUP 3: 100 MG LINURON MALE SCHEDULED EUTH 11/07/05 DATE OF DEATH: 11/07/05

ORGAN WEIGHT	ABS.(G)	REL.						GRADE
LIVER	11.0698	3.618	SEMINAL VESICLES	GROSS: SMALL				P
SEM VES/CG/FLUID	0.8911	0.291	NO SIGNIFICANT	BILATERAL				
PROSTATE	0.4271	0.140	CHANGES OBSERVED	GROSS:ADRENAL GLANDS	BRAIN	EPIDIDYMIDES	ESOPHAGUS	
EPIDIDYMIDES	1.0170	0.332		EYES	HEART	INTESTINE	KIDNEYS	
TESTIS, RT	1.6781	0.548		LIVER	LYMPH NODE, MES	LUNGS	MAMMARY GLAND	
TESTIS, LT	1.6729	0.547		TESTIS, LT	TESTIS, RT	PANCREAS	PITUITARY	
THYROID GLANDS	0.0169	0.006		PROSTATE	SPINAL CORD	SAL. GLAND MAND	SKIN	
FINAL BODY WT(G)	306.			SPLEEN	STOMACH	THYMUS	THYROID GLANDS	
				TRACHEA	URINARY BLADDER	COAGULATING GL		

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL, 2-MILD, 3-MODERATE, 4-SEVERE, P-PRESENT

ANIMAL NO. 97150 GROUP 3: 100 MG LINURON MALE SCHEDULED EUTH 11/07/05 DATE OF DEATH: 11/07/05

ORGAN WEIGHT	ABS.(G)	REL.	GRADE
LIVER	14.1006	4.040	
SEM VES/CG/FLUID	1.2457	0.357	
PROSTATE	0.5057	0.145	
EPIDIDYMIDES	0.9211	0.264	
TESTIS, RT	1.6690	0.478	
TESTIS, LT	1.6560	0.474	
THYROID GLANDS	0.0254	0.007	
FINAL BODY WT(G)	349.		

NO SIGNIFICANT CHANGES OBSERVED

GROSS:

ADRENAL GLANDS	BRAIN	EPIDIDYMIDES	ESOPHAGUS
EYES	HEART	INTESTINE	KIDNEYS
LIVER	LYMPH NODE, MES	LUNGS	MAMMARY GLAND
TESTIS, LT	TESTIS, RT	PANCREAS	PITUITARY
PROSTATE	SPINAL CORD	SAL. GLAND MAND	SKIN
SPLEEN	STOMACH	SEMINAL VESICLES	THYMUS
THYROID GLANDS	TRACHEA	URINARY BLADDER	COAGULATING GL

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL, 2-MILD, 3-MODERATE, 4-SEVERE, P-PRESENT

ANIMAL NO. 97152 GROUP 3: 100 MG LINURON MALE SCHEDULED EUTH 11/07/05 DATE OF DEATH: 11/07/05

ORGAN WEIGHT	ABS.(G)	REL.
LIVER	12.7551	4.238
SEM VES/CG/FLUID	1.3833	0.460
PROSTATE	0.6198	0.206
EPIDIDYMIDES	0.9237	0.307
TESTIS, RT	1.5573	0.517
TESTIS, LT	1.5386	0.511
THYROID GLANDS	0.0208	0.007
FINAL BODY WT(G)	301.	

SKIN: NO SIGNIFICANT CHANGES OBSERVED

GRADE

GROSS: HAIR LOSS P
ENTIRE VENTRAL SURFACE

GROSS:

ADRENAL GLANDS	BRAIN	EPIDIDYMIDES	ESOPHAGUS
EYES	HEART	INTESTINE	KIDNEYS
LIVER	LYMPH NODE, MES	LUNGS	MAMMARY GLAND
TESTIS, LT	TESTIS, RT	PANCREAS	PITUITARY
PROSTATE	SPINAL CORD	SAL. GLAND MAND	SPLEEN
STOMACH	SEMINAL VESICLES	THYMUS	THYROID GLANDS
TRACHEA	URINARY BLADDER	COAGULATING GL	

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL, 2-MILD, 3-MODERATE, 4-SEVERE, P-PRESENT

ANIMAL NO. 97163 GROUP 3: 100 MG LINURON MALE SCHEDULED EUTH 11/08/05 DATE OF DEATH: 11/08/05

ORGAN WEIGHT	ABS.(G)	REL.						GRADE
LIVER	10.9094	3.924	SEMINAL VESICLES	GROSS: SMALL				P
SEM VES/CG/FLUID	0.5669	0.204	NO SIGNIFICANT	BILATERAL				
PROSTATE	0.4124	0.148	CHANGES OBSERVED	GROSS: ADRENAL GLANDS	BRAIN	EPIDIDYMIDES	ESOPHAGUS	
EPIDIDYMIDES	0.8652	0.311		EYES	HEART	INTESTINE	KIDNEYS	
TESTIS, RT	1.7019	0.612		LIVER	LYMPH NODE, MES	LUNGS	MAMMARY GLAND	
TESTIS, LT	1.6943	0.609		TESTIS, LT	TESTIS, RT	PANCREAS	PITUITARY	
THYROID GLANDS	0.0179	0.006		PROSTATE	SPINAL CORD	SAL. GLAND MAND	SKIN	
FINAL BODY WT(G)	278.			SPLEEN	STOMACH	THYMUS	THYROID GLANDS	
				TRACHEA	URINARY BLADDER	COAGULATING GL		

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL, 2-MILD, 3-MODERATE, 4-SEVERE, P-PRESENT

SCHEDULED EUTHANASIA

PROJECT NO.:WIL-431014 INTER-LAB 15-DAY MALE RAT ASSAY WITH LINURON & PHENOBARBITAL

SPONSOR:BATTELLE INDIVIDUAL MACROSCOPIC AND MICROSCOPIC FINDINGS

SPONSOR NO.:68-W-01-023

ANIMAL NO. 97166 GROUP 3: 100 MG LINURON MALE SCHEDULED EUTH 11/08/05 DATE OF DEATH: 11/08/05

ORGAN WEIGHT	ABS.(G)	REL.	NO SIGNIFICANT CHANGES OBSERVED	GRADE GROSS:			
LIVER	15.3363	4.551		ADRENAL GLANDS	BRAIN	EPIDIDYMIDES	ESOPHAGUS
SEM VES/CG/FLUID	1.1779	0.350		EYES	HEART	INTESTINE	KIDNEYS
PROSTATE	0.5367	0.159		LIVER	LYMPH NODE, MES	LUNGS	MAMMARY GLAND
EPIDIDYMIDES	1.0070	0.299		TESTIS, LT	TESTIS, RT	PANCREAS	PITUITARY
TESTIS, RT	1.6887	0.501		PROSTATE	SPINAL CORD	SAL. GLAND MAND	SKIN
TESTIS, LT	1.6722	0.496		SPLEEN	STOMACH	SEMINAL VESICLES	THYMUS
THYROID GLANDS	0.0190	0.006		THYROID GLANDS	TRACHEA	URINARY BLADDER	COAGULATING GL
FINAL BODY WT(G)	337.						

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL, 2-MILD, 3-MODERATE, 4-SEVERE, P-PRESENT

ANIMAL NO. 97167 GROUP 3: 100 MG LINURON MALE SCHEDULED EUTH 11/08/05 DATE OF DEATH: 11/08/05

ORGAN WEIGHT	ABS.(G)	REL.	GRADE
LIVER	14.8078	4.136	
SEM VES/CG/FLUID	1.5567	0.435	
PROSTATE	0.7388	0.206	
EPIDIDYMIDES	0.8068	0.225	
TESTIS, RT	1.6032	0.448	
TESTIS, LT	1.6389	0.458	
THYROID GLANDS	0.0218	0.006	
FINAL BODY WT(G)	358.		

NO SIGNIFICANT CHANGES OBSERVED

GROSS:

ADRENAL GLANDS	BRAIN	EPIDIDYMIDES	ESOPHAGUS
EYES	HEART	INTESTINE	KIDNEYS
LIVER	LYMPH NODE, MES	LUNGS	MAMMARY GLAND
TESTIS, LT	TESTIS, RT	PANCREAS	PITUITARY
PROSTATE	SPINAL CORD	SAL. GLAND MAND	SKIN
SPLEEN	STOMACH	SEMINAL VESICLES	THYMUS
THYROID GLANDS	TRACHEA	URINARY BLADDER	COAGULATING GL

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL, 2-MILD, 3-MODERATE, 4-SEVERE, P-PRESENT

ANIMAL NO. 97170 GROUP 3: 100 MG LINURON MALE SCHEDULED EUTH 11/08/05 DATE OF DEATH: 11/08/05

ORGAN WEIGHT	ABS.(G)	REL.	GRADE
LIVER	14.2135	4.108	
SEM VES/CG/FLUID	1.2553	0.363	
PROSTATE	0.5347	0.155	
EPIDIDYMIDES	0.9469	0.274	
TESTIS, RT	1.6177	0.468	
TESTIS, LT	1.5414	0.445	
THYROID GLANDS	0.0272	0.008	
FINAL BODY WT(G)	346.		

NO SIGNIFICANT CHANGES OBSERVED

GROSS:

ADRENAL GLANDS	BRAIN	EPIDIDYMIDES	ESOPHAGUS	
EYES	HEART	INTESTINE	KIDNEYS	
LIVER	LYMPH NODE, MES	LUNGS	MAMMARY GLAND	
TESTIS, LT	TESTIS, RT	PANCREAS	PITUITARY	
PROSTATE	SPINAL CORD	SAL. GLAND MAND	SKIN	
SPLEEN	STOMACH	SEMINAL VESICLES	THYMUS	
THYROID GLANDS	TRACHEA	URINARY BLADDER	COAGULATING GL	

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL, 2-MILD, 3-MODERATE, 4-SEVERE, P-PRESENT

ANIMAL NO. 97181 GROUP 3: 100 MG LINURON MALE SCHEDULED EUTH 11/08/05 DATE OF DEATH: 11/08/05

ORGAN WEIGHT	ABS.(G)	REL.	GRADE
LIVER	13.1454	4.282	
SEM VES/CG/FLUID	1.2186	0.397	
PROSTATE	0.6207	0.202	
EPIDIDYMIDES	0.8560	0.279	
TESTIS, RT	1.6445	0.536	
TESTIS, LT	1.6256	0.530	
THYROID GLANDS	0.0244	0.008	
FINAL BODY WT(G)	307.		

NO SIGNIFICANT CHANGES OBSERVED

GROSS:

ADRENAL GLANDS	BRAIN	EPIDIDYMIDES	ESOPHAGUS
EYES	HEART	INTESTINE	KIDNEYS
LIVER	LYMPH NODE, MES	LUNGS	MAMMARY GLAND
TESTIS, LT	TESTIS, RT	PANCREAS	PITUITARY
PROSTATE	SPINAL CORD	SAL. GLAND MAND	SKIN
SPLEEN	STOMACH	SEMINAL VESICLES	THYMUS
THYROID GLANDS	TRACHEA	URINARY BLADDER	COAGULATING GL

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL, 2-MILD, 3-MODERATE, 4-SEVERE, P-PRESENT

ANIMAL NO. 97184 GROUP 3: 100 MG LINURON MALE SCHEDULED EUTH 11/09/05 DATE OF DEATH: 11/09/05

ORGAN WEIGHT	ABS.(G)	REL.
LIVER	12.6246	3.803
SEM VES/CG/FLUID	1.3220	0.398
PROSTATE	0.8039	0.242
EPIDIDYMIDES	0.9211	0.277
TESTIS, RT	1.4997	0.452
TESTIS, LT	1.4584	0.439
THYROID GLANDS	0.0206	0.006
FINAL BODY WT(G)	332.	

SPLEEN NO SIGNIFICANT CHANGES OBSERVED

GRADE

GROSS: AREA(S), WHITE P
FEW, IRREGULARLY SHAPED

GROSS:

ADRENAL GLANDS	BRAIN	EPIDIDYMIDES	ESOPHAGUS
EYES	HEART	INTESTINE	KIDNEYS
LIVER	LYMPH NODE, MES	LUNGS	MAMMARY GLAND
TESTIS, LT	TESTIS, RT	PANCREAS	PITUITARY
PROSTATE	SPINAL CORD	SAL. GLAND MAND	SKIN
STOMACH	SEMINAL VESICLES	THYMUS	THYROID GLANDS
TRACHEA	URINARY BLADDER	COAGULATING GL	

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL, 2-MILD, 3-MODERATE, 4-SEVERE, P-PRESENT

ANIMAL NO. 97185 GROUP 3: 100 MG LINURON MALE SCHEDULED EUTH 11/09/05 DATE OF DEATH: 11/09/05

ORGAN WEIGHT	ABS.(G)	REL.						GRADE
LIVER	15.7151	4.691	SEMINAL VESICLES	GROSS: SMALL				P
SEM VES/CG/FLUID	1.1053	0.330	NO SIGNIFICANT	BILATERAL				
PROSTATE	0.5143	0.154	CHANGES OBSERVED	GROSS: ADRENAL GLANDS	BRAIN	EPIDIDYMIDES	ESOPHAGUS	
EPIDIDYMIDES	0.9437	0.282		EYES	HEART	INTESTINE	KIDNEYS	
TESTIS, RT	1.5667	0.468		LIVER	LYMPH NODE, MES	LUNGS	MAMMARY GLAND	
TESTIS, LT	1.5564	0.465		TESTIS, LT	TESTIS, RT	PANCREAS	PITUITARY	
THYROID GLANDS	0.0171	0.005		PROSTATE	SPINAL CORD	SAL. GLAND MAND	SKIN	
FINAL BODY WT(G)	335.			SPLEEN	STOMACH	THYMUS	THYROID GLANDS	
				TRACHEA	URINARY BLADDER	COAGULATING GL		

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL, 2-MILD, 3-MODERATE, 4-SEVERE, P-PRESENT

SCHEDULED EUTHANASIA

PROJECT NO.:WIL-431014 INTER-LAB 15-DAY MALE RAT ASSAY WITH LINURON & PHENOBARBITAL

SPONSOR:BATTELLE INDIVIDUAL MACROSCOPIC AND MICROSCOPIC FINDINGS

SPONSOR NO.:68-W-01-023

ANIMAL NO. 97188 GROUP 3: 100 MG LINURON MALE SCHEDULED EUTH 11/09/05 DATE OF DEATH: 11/09/05

ORGAN WEIGHT	ABS.(G)	REL.	NO SIGNIFICANT CHANGES OBSERVED	GRADE			
LIVER	13.6014	4.024	GROSS:	ADRENAL GLANDS	BRAIN	EPIDIDYMIDES	ESOPHAGUS
SEM VES/CG/FLUID	1.4094	0.417		EYES	HEART	INTESTINE	KIDNEYS
PROSTATE	0.4816	0.142		LIVER	LYMPH NODE, MES	LUNGS	MAMMARY GLAND
EPIDIDYMIDES	0.9040	0.267		TESTIS, LT	TESTIS, RT	PANCREAS	PITUITARY
TESTIS, RT	1.4108	0.417		PROSTATE	SPINAL CORD	SAL. GLAND MAND	SKIN
TESTIS, LT	1.3436	0.398		SPLEEN	STOMACH	SEMINAL VESICLES	THYMUS
THYROID GLANDS	0.0231	0.007		THYROID GLANDS	TRACHEA	URINARY BLADDER	COAGULATING GL
FINAL BODY WT(G)	338.						

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL, 2-MILD, 3-MODERATE, 4-SEVERE, P-PRESENT

ANIMAL NO. 97193 GROUP 3: 100 MG LINURON MALE SCHEDULED EUTH 11/09/05 DATE OF DEATH: 11/09/05

ORGAN WEIGHT	ABS.(G)	REL.			GRADE
LIVER	12.5873	3.909	PROSTATE	GROSS: SMALL	P
SEM VES/CG/FLUID	0.6140	0.191	SEMINAL VESICLES	GROSS: SMALL	P
PROSTATE	0.3096	0.096		BILATERAL	
EPIDIDYMIDES	0.7161	0.222	SEMINAL VESICLES	GROSS: SOFT	P
TESTIS, RT	1.3514	0.420		BILATERAL	
TESTIS, LT	1.3047	0.405	NO SIGNIFICANT		
THYROID GLANDS	0.0175	0.005	CHANGES OBSERVED		
FINAL BODY WT(G)	322.				

GROSS: ADRENAL GLANDS, BRAIN, EPIDIDYMIDES, ESOPHAGUS, EYES, HEART, INTESTINE, KIDNEYS, LIVER, LYMPH NODE, MES, LUNGS, MAMMARY GLAND, TESTIS, LT, TESTIS, RT, PANCREAS, PITUITARY, SPINAL CORD, SAL. GLAND MAND, SKIN, SPLEEN, STOMACH, THYMUS, THYROID GLANDS, TRACHEA, URINARY BLADDER, COAGULATING GL

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL, 2-MILD, 3-MODERATE, 4-SEVERE, P-PRESENT

ANIMAL NO. 97238 GROUP 3: 100 MG LINURON MALE SCHEDULED EUTH 11/09/05 DATE OF DEATH: 11/09/05

ORGAN WEIGHT	ABS.(G)	REL.	NO SIGNIFICANT CHANGES OBSERVED	GRADE
LIVER	15.0871	4.477		
SEM VES/CG/FLUID	1.3712	0.407		
PROSTATE	0.6133	0.182		
EPIDIDYMIDES	0.9462	0.281		
TESTIS, RT	1.6276	0.483		
TESTIS, LT	1.6229	0.482		
THYROID GLANDS	0.0172	0.005		
FINAL BODY WT(G)	337.			

GROSS:				
ADRENAL GLANDS	BRAIN	EPIDIDYMIDES	ESOPHAGUS	
EYES	HEART	INTESTINE	KIDNEYS	
LIVER	LYMPH NODE, MES	LUNGS	MAMMARY GLAND	
TESTIS, LT	TESTIS, RT	PANCREAS	PITUITARY	
PROSTATE	SPINAL CORD	SAL. GLAND MAND	SKIN	
SPLEEN	STOMACH	SEMINAL VESICLES	THYMUS	
THYROID GLANDS	TRACHEA	URINARY BLADDER	COAGULATING GL	

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL, 2-MILD, 3-MODERATE, 4-SEVERE, P-PRESENT

ANIMAL NO. 97128 GROUP 4: 150 MG LINURON MALE SCHEDULED EUTH 11/07/05 DATE OF DEATH: 11/07/05

ORGAN WEIGHT	ABS.(G)	REL.
LIVER	11.7742	3.938
SEM VES/CG/FLUID	0.8045	0.269
PROSTATE	0.3882	0.130
EPIDIDYMIDES	0.7920	0.265
TESTIS, RT	1.5189	0.508
TESTIS, LT	1.4933	0.499
THYROID GLANDS	0.0188	0.006
FINAL BODY WT(G)	299.	

		GRADE
EPIDIDYMIDES	MICRO: INFILTRATE, MONONUCLEAR	
	FOCAL	1
SEMINAL VESICLES	GROSS: SMALL	
	BILATERAL	P
THYROID GLANDS	MICRO: FOLLICULAR EPITHELIAL HEIGHT	
	BILATERAL	2
	COLLOID AREA	
	BILATERAL	3
	CYST, ULTIMOBRANCHIAL	
	FOCAL, UNILATERAL	1

NO SIGNIFICANT CHANGES OBSERVED

GROSS: ADRENAL GLANDS, BRAIN, EPIDIDYMIDES, ESOPHAGUS, EYES, HEART, INTESTINE, KIDNEYS, LIVER, LYMPH NODE, MES, LUNGS, MAMMARY GLAND, TESTIS, LT, TESTIS, RT, PANCREAS, PITUITARY, PROSTATE, SPINAL CORD, SAL. GLAND MAND, SKIN, SPLEEN, STOMACH, THYMUS, THYROID GLANDS, TRACHEA, URINARY BLADDER, COAGULATING GL

MICRO: TESTES

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL, 2-MILD, 3-MODERATE, 4-SEVERE, P-PRESENT

ANIMAL NO. 97140 GROUP 4: 150 MG LINURON MALE SCHEDULED EUTH 11/07/05 DATE OF DEATH: 11/07/05

ORGAN WEIGHT	ABS.(G)	REL.
LIVER	13.2695	4.267
SEM VES/CG/FLUID	0.9529	0.306
PROSTATE	0.5545	0.178
EPIDIDYMIDES	0.9399	0.302
TESTIS, RT	1.5915	0.512
TESTIS, LT	1.5502	0.498
THYROID GLANDS	0.0181	0.006
FINAL BODY WT(G)	311.	

NO SIGNIFICANT CHANGES OBSERVED

			GRADE
EPIDIDYMIDES	MICRO: INFILTRATE, MONONUCLEAR		
	MULTIFOCAL		1
THYROID GLANDS	MICRO: FOLLICULAR EPITHELIAL HEIGHT		
	BILATERAL		1
	COLLOID AREA		
	BILATERAL		4
	CYST, ULTIMOBRANCHIAL		
	MULTIFOCAL, UNILATERAL		1

GROSS: ADRENAL GLANDS, BRAIN, EPIDIDYMIDES, ESOPHAGUS, EYES, HEART, INTESTINE, KIDNEYS, LIVER, LYMPH NODE, MES, LUNGS, MAMMARY GLAND, TESTIS, LT, TESTIS, RT, PANCREAS, PITUITARY, PROSTATE, SPINAL CORD, SAL. GLAND MAND, SKIN, SPLEEN, STOMACH, SEMINAL VESICLES, THYMUS, THYROID GLANDS, TRACHEA, URINARY BLADDER, COAGULATING GL

MICRO: TESTES

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL, 2-MILD, 3-MODERATE, 4-SEVERE, P-PRESENT

ANIMAL NO. 97142 GROUP 4: 150 MG LINURON MALE SCHEDULED EUTH 11/07/05 DATE OF DEATH: 11/07/05

ORGAN WEIGHT	ABS.(G)	REL.
LIVER	12.0973	3.745
SEM VES/CG/FLUID	1.7480	0.541
PROSTATE	0.6654	0.206
EPIDIDYMIDES	0.8677	0.269
TESTIS, RT	1.6047	0.497
TESTIS, LT	1.5075	0.467
THYROID GLANDS	0.0229	0.007
FINAL BODY WT(G)	323.	

EPIDIDYMIDES
THYROID GLANDS
NO SIGNIFICANT CHANGES OBSERVED

				GRADE
MICRO:	INFILTRATE, MONONUCLEAR			1
	MULTIFOCAL			
MICRO:	FOLLICULAR EPITHELIAL HEIGHT			4
	BILATERAL			
	COLLOID AREA			2
	BILATERAL			

GROSS: ADRENAL GLANDS, BRAIN, EPIDIDYMIDES, ESOPHAGUS, EYES, HEART, INTESTINE, KIDNEYS, LIVER, LYMPH NODE, MES, LUNGS, MAMMARY GLAND, TESTIS, LT, TESTIS, RT, PANCREAS, PITUITARY, PROSTATE, SPINAL CORD, SAL. GLAND MAND, SKIN, SPLEEN, STOMACH, SEMINAL VESICLES, THYMUS, THYROID GLANDS, TRACHEA, URINARY BLADDER, COAGULATING GL

MICRO: TESTES

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL, 2-MILD, 3-MODERATE, 4-SEVERE, P-PRESENT

ANIMAL NO. 97144 GROUP 4: 150 MG LINURON MALE SCHEDULED EUTH 11/07/05 DATE OF DEATH: 11/07/05

ORGAN WEIGHT	ABS.(G)	REL.
LIVER	11.6323	3.728
SEM VES/CG/FLUID	1.5750	0.505
PROSTATE	0.6053	0.194
EPIDIDYMIDES	1.0014	0.321
TESTIS, RT	1.6147	0.518
TESTIS, LT	1.6729	0.536
THYROID GLANDS	0.0201	0.006
FINAL BODY WT(G)	312.	

		GRADE
EPIDIDYMIDES	MICRO: INFILTRATE, MONONUCLEAR	
	MULTIFOCAL	1
SKIN	GROSS: HAIR LOSS	
	HINDLIMB, BILATERAL	P
THYROID GLANDS	MICRO: FOLLICULAR EPITHELIAL HEIGHT	
	BILATERAL	2
	COLLOID AREA	
	BILATERAL	3
	CYST, ULTIMOBRANCHIAL	
	MULTIFOCAL, BILATERAL	1

NO SIGNIFICANT CHANGES OBSERVED

GROSS: ADRENAL GLANDS, BRAIN, EPIDIDYMIDES, ESOPHAGUS, EYES, HEART, INTESTINE, KIDNEYS, LIVER, LYMPH NODE, MES, LUNGS, MAMMARY GLAND, TESTIS, LT, TESTIS, RT, PANCREAS, PITUITARY, PROSTATE, SPINAL CORD, SAL. GLAND MAND, SPLEEN, STOMACH, SEMINAL VESICLES, THYMUS, THYROID GLANDS, TRACHEA, URINARY BLADDER, COAGULATING GL

MICRO: TESTES

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL, 2-MILD, 3-MODERATE, 4-SEVERE, P-PRESENT

ANIMAL NO. 97161 GROUP 4: 150 MG LINURON MALE SCHEDULED EUTH 11/07/05 DATE OF DEATH: 11/07/05

ORGAN WEIGHT	ABS.(G)	REL.
LIVER	11.7644	3.935
SEM VES/CG/FLUID	1.4687	0.491
PROSTATE	0.6880	0.230
EPIDIDYMIDES	1.0897	0.364
TESTIS, RT	1.7881	0.598
TESTIS, LT	1.7305	0.579
THYROID GLANDS	0.0151	0.005
FINAL BODY WT(G)	299.	

		GRADE
EPIDIDYMIDES	MICRO: LUMINAL DEBRIS, CELLULAR BILATERAL	1
	INFILTRATE, MONONUCLEAR FOCAL	1
THYROID GLANDS	MICRO: FOLLICULAR EPITHELIAL HEIGHT BILATERAL	4
	COLLOID AREA BILATERAL	1
TESTES	MICRO: RETENTION, SPERMATIDS MULTIFOCAL, BILATERAL	1
	DECREASED ELONGATED SPERMATIDS MULTIFOCAL, BILATERAL	1
	VACUOLATION, SEMINIFEROUS EPITHELIUM MULTIFOCAL, BILATERAL	1
	GIANT CELL, MULTINUCLEATED MULTIFOCAL, BILATERAL	1
NO SIGNIFICANT CHANGES OBSERVED	GROSS:	

ADRENAL GLANDS	BRAIN	EPIDIDYMIDES	ESOPHAGUS
EYES	HEART	INTESTINE	KIDNEYS
LIVER	LYMPH NODE, MES	LUNGS	MAMMARY GLAND
TESTIS, LT	TESTIS, RT	PANCREAS	PITUITARY
PROSTATE	SPINAL CORD	SAL. GLAND MAND	SKIN
SPLEEN	STOMACH	SEMINAL VESICLES	THYMUS
THYROID GLANDS	TRACHEA	URINARY BLADDER	COAGULATING GL

ANIMAL NO. 97161 GROUP 4: 150 MG LINURON MALE SCHEDULED EUTH 11/07/05 DATE OF DEATH: 11/07/05

GRADE

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL, 2-MILD, 3-MODERATE, 4-SEVERE, P-PRESENT

ANIMAL NO. 97162 GROUP 4: 150 MG LINURON MALE SCHEDULED EUTH 11/08/05 DATE OF DEATH: 11/08/05

ORGAN WEIGHT	ABS.(G)	REL.
LIVER	12.2299	4.077
SEM VES/CG/FLUID	1.0868	0.362
PROSTATE	0.5386	0.180
EPIDIDYMIDES	0.8988	0.300
TESTIS, RT	1.6797	0.560
TESTIS, LT	1.7205	0.573
THYROID GLANDS	0.0207	0.007
FINAL BODY WT(G)	300.	

		GRADE
EPIDIDYMIDES	MICRO: INFILTRATE, MONONUCLEAR	
	FOCAL	1
SEMINAL VESICLES	GROSS: SMALL	
	BILATERAL	P
THYROID GLANDS	MICRO: FOLLICULAR EPITHELIAL HEIGHT	
	BILATERAL	1
	COLLOID AREA	
	BILATERAL	4
	CYST, ULTIMOBRANCHIAL	
	MULTIFOCAL, UNILATERAL	1
	MITOTIC FIGURES	
	MULTIFOCAL, BILATERAL	1
	INFLAMMATION, ACUTE	
	FOCAL, UNILATERAL	1

NO SIGNIFICANT CHANGES OBSERVED

GROSS: ADRENAL GLANDS, BRAIN, EPIDIDYMIDES, ESOPHAGUS, EYES, HEART, INTESTINE, KIDNEYS, LIVER, LYMPH NODE, MES, LUNGS, MAMMARY GLAND, TESTIS, LT, TESTIS, RT, PANCREAS, PITUITARY, PROSTATE, SPINAL CORD, SAL. GLAND MAND, SKIN, SPLEEN, STOMACH, THYMUS, THYROID GLANDS, TRACHEA, URINARY BLADDER, COAGULATING GL

MICRO: TESTES

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL, 2-MILD, 3-MODERATE, 4-SEVERE, P-PRESENT

ANIMAL NO. 97171 GROUP 4: 150 MG LINURON MALE SCHEDULED EUTH 11/08/05 DATE OF DEATH: 11/08/05

ORGAN WEIGHT	ABS.(G)	REL.
LIVER	12.4179	3.980
SEM VES/CG/FLUID	1.0056	0.322
PROSTATE	0.6952	0.223
EPIDIDYMIDES	0.8354	0.268
TESTIS, RT	1.7160	0.550
TESTIS, LT	1.6548	0.530
THYROID GLANDS	0.0176	0.006
FINAL BODY WT(G)	312.	

SEMINAL VESICLES

NO SIGNIFICANT CHANGES OBSERVED

THYROID GLANDS

		GRADE
GROSS:	SMALL	P
	BOTH HORNS	
MICRO:	FOLLICULAR EPITHELIAL HEIGHT	3
	BILATERAL	
	COLLOID AREA	2
	BILATERAL	
	CYST, ULTIMOBRANCHIAL	1
	FOCAL, UNILATERAL	

GROSS:

ADRENAL GLANDS	BRAIN	EPIDIDYMIDES	ESOPHAGUS
EYES	HEART	INTESTINE	KIDNEYS
LIVER	LYMPH NODE, MES	LUNGS	MAMMARY GLAND
TESTIS, LT	TESTIS, RT	PANCREAS	PITUITARY
PROSTATE	SPINAL CORD	SAL. GLAND MAND	SKIN
SPLEEN	STOMACH	THYMUS	THYROID GLANDS
TRACHEA	URINARY BLADDER	COAGULATING GL	

MICRO:

EPIDIDYMIDES	TESTES	

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL, 2-MILD, 3-MODERATE, 4-SEVERE, P-PRESENT

ANIMAL NO. 97174 GROUP 4: 150 MG LINURON MALE SCHEDULED EUTH 11/08/05 DATE OF DEATH: 11/08/05

ORGAN WEIGHT	ABS.(G)	REL.
LIVER	12.1522	3.958
SEM VES/CG/FLUID	1.1622	0.379
PROSTATE	0.5595	0.182
EPIDIDYMIDES	0.9956	0.324
TESTIS, RT	1.7063	0.556
TESTIS, LT	1.6019	0.522
THYROID GLANDS	0.0223	0.007
FINAL BODY WT(G)	307.	

		GRADE
EPIDIDYMIDES	MICRO: LUMINAL DEBRIS, CELLULAR UNILATERAL	1
	INFILTRATE, MONONUCLEAR MULTIFOCAL	1
THYROID GLANDS	MICRO: FOLLICULAR EPITHELIAL HEIGHT BILATERAL	2
	COLLOID AREA BILATERAL	4
	CYST, ULTIMOBRANCHIAL MULTIFOCAL, UNILATERAL	1

NO SIGNIFICANT CHANGES OBSERVED

GROSS:

ADRENAL GLANDS	BRAIN	EPIDIDYMIDES	ESOPHAGUS
EYES	HEART	INTESTINE	KIDNEYS
LIVER	LYMPH NODE, MES	LUNGS	MAMMARY GLAND
TESTIS, LT	TESTIS, RT	PANCREAS	PITUITARY
PROSTATE	SPINAL CORD	SAL. GLAND MAND	SKIN
SPLEEN	STOMACH	SEMINAL VESICLES	THYMUS
THYROID GLANDS	TRACHEA	URINARY BLADDER	COAGULATING GL

MICRO:TESTES

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL, 2-MILD, 3-MODERATE, 4-SEVERE, P-PRESENT

ANIMAL NO. 97207 GROUP 4: 150 MG LINURON MALE SCHEDULED EUTH 11/08/05 DATE OF DEATH: 11/08/05

ORGAN WEIGHT	ABS.(G)	REL.
LIVER	14.8017	4.568
SEM VES/CG/FLUID	1.5990	0.494
PROSTATE	0.5212	0.161
EPIDIDYMIDES	1.0178	0.314
TESTIS, RT	1.6962	0.524
TESTIS, LT	1.6778	0.518
THYROID GLANDS	0.0182	0.006
FINAL BODY WT(G)	324.	

		GRADE
EPIDIDYMIDES	MICRO: LUMINAL DEBRIS, CELLULAR BILATERAL	1
	INFILTRATE, MONONUCLEAR FOCAL	1
THYROID GLANDS	MICRO: FOLLICULAR EPITHELIAL HEIGHT BILATERAL	3
	COLLOID AREA BILATERAL	2
	CYST, ULTIMOBRANCHIAL MULTIFOCAL, UNILATERAL	1
	MITOTIC FIGURES MULTIFOCAL, BILATERAL	1
TESTES	MICRO: GIANT CELL, MULTINUCLEATED FOCAL, UNILATERAL	1

NO SIGNIFICANT CHANGES OBSERVED

GROSS:

ADRENAL GLANDS	BRAIN	EPIDIDYMIDES	ESOPHAGUS
EYES	HEART	INTESTINE	KIDNEYS
LIVER	LYMPH NODE, MES	LUNGS	MAMMARY GLAND
TESTIS, LT	TESTIS, RT	PANCREAS	PITUITARY
PROSTATE	SPINAL CORD	SAL. GLAND MAND	SKIN
SPLEEN	STOMACH	SEMINAL VESICLES	THYMUS
THYROID GLANDS	TRACHEA	URINARY BLADDER	COAGULATING GL

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL, 2-MILD, 3-MODERATE, 4-SEVERE, P-PRESENT

ANIMAL NO. 97211 GROUP 4: 150 MG LINURON MALE SCHEDULED EUTH 11/08/05 DATE OF DEATH: 11/08/05

ORGAN WEIGHT	ABS.(G)	REL.
LIVER	13.2364	4.442
SEM VES/CG/FLUID	1.3373	0.449
PROSTATE	0.7154	0.240
EPIDIDYMIDES	0.9143	0.307
TESTIS, RT	1.5759	0.529
TESTIS, LT	1.5603	0.524
THYROID GLANDS	0.0165	0.006
FINAL BODY WT(G)	298.	

		GRADE
EPIDIDYMIDES	MICRO: INFILTRATE, MONONUCLEAR	
	FOCAL	1
KIDNEYS	GROSS: DILATED PELVIS	
	RIGHT	2
THYROID GLANDS	MICRO: FOLLICULAR EPITHELIAL HEIGHT	
	BILATERAL	
	COLLOID AREA	
	BILATERAL	1
	CYST, ULTIMOBRANCHIAL	
	MULTIFOCAL, BILATERAL	1
	MITOTIC FIGURES	
	MULTIFOCAL, BILATERAL	1

NO SIGNIFICANT CHANGES OBSERVED

GROSS:

ADRENAL GLANDS	BRAIN	EPIDIDYMIDES	ESOPHAGUS
EYES	HEART	INTESTINE	LIVER
LYMPH NODE, MES	LUNGS	MAMMARY GLAND	TESTIS, LT
TESTIS, RT	PANCREAS	PITUITARY	PROSTATE
SPINAL CORD	SAL. GLAND MAND	SKIN	SPLEEN
STOMACH	SEMINAL VESICLES	THYMUS	THYROID GLANDS
TRACHEA	URINARY BLADDER	COAGULATING GL	

MICRO:TESTES

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL, 2-MILD, 3-MODERATE, 4-SEVERE, P-PRESENT

ANIMAL NO. 97214 GROUP 4: 150 MG LINURON MALE SCHEDULED EUTH 11/09/05 DATE OF DEATH: 11/09/05

ORGAN WEIGHT	ABS.(G)	REL.
LIVER	14.1564	4.882
SEM VES/CG/FLUID	0.9735	0.336
PROSTATE	0.4458	0.154
EPIDIDYMIDES	0.9240	0.319
TESTIS, RT	1.4606	0.504
TESTIS, LT	1.4758	0.509
THYROID GLANDS	0.0185	0.006
FINAL BODY WT(G)	290.	

THYROID GLANDS — NO SIGNIFICANT CHANGES OBSERVED

				GRADE
MICRO:	FOLLICULAR EPITHELIAL HEIGHT			2
	BILATERAL			
	COLLOID AREA			3
	BILATERAL			
	CYST, ULTIMOBRANCHIAL			1
	MULTIFOCAL, BILATERAL			

GROSS:	ADRENAL GLANDS	BRAIN	EPIDIDYMIDES	ESOPHAGUS
	EYES	HEART	INTESTINE	KIDNEYS
	LIVER	LYMPH NODE, MES	LUNGS	MAMMARY GLAND
	TESTIS, LT	TESTIS, RT	PANCREAS	PITUITARY
	PROSTATE	SPINAL CORD	SAL. GLAND MAND	SKIN
	SPLEEN	STOMACH	SEMINAL VESICLES	THYMUS
	THYROID GLANDS	TRACHEA	URINARY BLADDER	COAGULATING GL
MICRO:	EPIDIDYMIDES	TESTES		

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL, 2-MILD, 3-MODERATE, 4-SEVERE, P-PRESENT

ANIMAL NO. 97222 GROUP 4: 150 MG LINURON MALE SCHEDULED EUTH 11/09/05 DATE OF DEATH: 11/09/05

ORGAN WEIGHT	ABS.(G)	REL.
LIVER	11.9787	3.877
SEM VES/CG/FLUID	1.3927	0.451
PROSTATE	0.6461	0.209
EPIDIDYMIDES	0.9366	0.303
TESTIS, RT	1.6854	0.545
TESTIS, LT	1.6106	0.521
THYROID GLANDS	0.0212	0.007
FINAL BODY WT(G)	309.	

NO SIGNIFICANT CHANGES OBSERVED

		GRADE
EPIDIDYMIDES	MICRO: INFILTRATE, MONONUCLEAR	
	MULTIFOCAL	1
THYROID GLANDS	MICRO: FOLLICULAR EPITHELIAL HEIGHT	
	BILATERAL	2
	COLLOID AREA	
	BILATERAL	3
	CYST, ULTIMOBRANCHIAL	
	MULTIFOCAL, BILATERAL	1

GROSS: ADRENAL GLANDS, BRAIN, EPIDIDYMIDES, ESOPHAGUS, EYES, HEART, INTESTINE, KIDNEYS, LIVER, LYMPH NODE, MES, LUNGS, MAMMARY GLAND, TESTIS, LT, TESTIS, RT, PANCREAS, PITUITARY, PROSTATE, SPINAL CORD, SAL. GLAND MAND, SKIN, SPLEEN, STOMACH, SEMINAL VESICLES, THYMUS, THYROID GLANDS, TRACHEA, URINARY BLADDER, COAGULATING GL

MICRO: TESTES

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL, 2-MILD, 3-MODERATE, 4-SEVERE, P-PRESENT

ANIMAL NO. 97225 GROUP 4: 150 MG LINURON MALE SCHEDULED EUTH 11/09/05 DATE OF DEATH: 11/09/05

ORGAN WEIGHT	ABS.(G)	REL.
LIVER	14.3576	4.235
SEM VES/CG/FLUID	1.6141	0.476
PROSTATE	0.7308	0.216
EPIDIDYMIDES	1.0282	0.303
TESTIS, RT	1.5780	0.465
TESTIS, LT	1.5781	0.466
THYROID GLANDS	0.0232	0.007
FINAL BODY WT(G)	339.	

EPIDIDYMIDES
THYROID GLANDS
NO SIGNIFICANT CHANGES OBSERVED

		GRADE
MICRO:	INFILTRATE, MONONUCLEAR	1
	MULTIFOCAL	
MICRO:	FOLLICULAR EPITHELIAL HEIGHT	2
	BILATERAL	
	COLLOID AREA	3
	BILATERAL	

GROSS: ADRENAL GLANDS, BRAIN, EPIDIDYMIDES, ESOPHAGUS, EYES, HEART, INTESTINE, KIDNEYS, LIVER, LYMPH NODE, MES, LUNGS, MAMMARY GLAND, TESTIS, LT, TESTIS, RT, PANCREAS, PITUITARY, PROSTATE, SPINAL CORD, SAL. GLAND MAND, SKIN, SPLEEN, STOMACH, SEMINAL VESICLES, THYMUS, THYROID GLANDS, TRACHEA, URINARY BLADDER, COAGULATING GL

MICRO: TESTES

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL, 2-MILD, 3-MODERATE, 4-SEVERE, P-PRESENT

ANIMAL NO. 97231 GROUP 4: 150 MG LINURON MALE SCHEDULED EUTH 11/09/05 DATE OF DEATH: 11/09/05

ORGAN WEIGHT	ABS.(G)	REL.
LIVER	11.9280	3.937
SEM VES/CG/FLUID	0.9318	0.308
PROSTATE	0.4819	0.159
EPIDIDYMIDES	1.0205	0.337
TESTIS, RT	1.6949	0.559
TESTIS, LT	1.6336	0.539
THYROID GLANDS	0.0201	0.007
FINAL BODY WT(G)	303.	

NO SIGNIFICANT CHANGES OBSERVED

		GRADE
EPIDIDYMIDES	MICRO: INFILTRATE, MONONUCLEAR	
	FOCAL	1
SKIN	GROSS: HAIR LOSS	
	ENTIRE VENTRAL SURFACE	P
THYROID GLANDS	MICRO: FOLLICULAR EPITHELIAL HEIGHT	
	BILATERAL	
	COLLOID AREA	
	BILATERAL	4

GROSS: ADRENAL GLANDS, BRAIN, EPIDIDYMIDES, ESOPHAGUS, EYES, HEART, INTESTINE, KIDNEYS, LIVER, LYMPH NODE, MES, LUNGS, MAMMARY GLAND, TESTIS, LT, TESTIS, RT, PANCREAS, PITUITARY, PROSTATE, SPINAL CORD, SAL. GLAND MAND, SPLEEN, STOMACH, SEMINAL VESICLES, THYMUS, THYROID GLANDS, TRACHEA, URINARY BLADDER, COAGULATING GL

MICRO: TESTES

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL, 2-MILD, 3-MODERATE, 4-SEVERE, P-PRESENT

ANIMAL NO. 97121 GROUP 5: 25 MG PHENO MALE SCHEDULED EUTH 11/07/05 DATE OF DEATH: 11/07/05

ORGAN WEIGHT	ABS.(G)	REL.	GRADE
LIVER	17.8690	4.778	
SEM VES/CG/FLUID	1.3466	0.360	
PROSTATE	0.6827	0.183	
EPIDIDYMIDES	1.0444	0.279	
TESTIS, RT	1.6406	0.439	
TESTIS, LT	1.6055	0.429	
THYROID GLANDS	0.0282	0.008	
FINAL BODY WT(G)	374.		

NO SIGNIFICANT CHANGES OBSERVED

GROSS:

ADRENAL GLANDS	BRAIN	EPIDIDYMIDES	ESOPHAGUS
EYES	HEART	INTESTINE	KIDNEYS
LIVER	LYMPH NODE, MES	LUNGS	MAMMARY GLAND
TESTIS, LT	TESTIS, RT	PANCREAS	PITUITARY
PROSTATE	SPINAL CORD	SAL. GLAND MAND	SKIN
SPLEEN	STOMACH	SEMINAL VESICLES	THYMUS
THYROID GLANDS	TRACHEA	URINARY BLADDER	COAGULATING GL

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL, 2-MILD, 3-MODERATE, 4-SEVERE, P-PRESENT

ANIMAL NO. 97127 GROUP 5: 25 MG PHENO MALE SCHEDULED EUTH 11/07/05 DATE OF DEATH: 11/07/05

ORGAN WEIGHT	ABS.(G)	REL.	GRADE
LIVER	22.3932	5.032	
SEM VES/CG/FLUID	1.3025	0.293	
PROSTATE	0.7724	0.174	
EPIDIDYMIDES	0.8985	0.202	
TESTIS, RT	1.6429	0.369	
TESTIS, LT	1.6119	0.362	
THYROID GLANDS	0.0234	0.005	
FINAL BODY WT(G)	445.		

NO SIGNIFICANT CHANGES OBSERVED

GROSS:

ADRENAL GLANDS	BRAIN	EPIDIDYMIDES	ESOPHAGUS
EYES	HEART	INTESTINE	KIDNEYS
LIVER	LYMPH NODE, MES	LUNGS	MAMMARY GLAND
TESTIS, LT	TESTIS, RT	PANCREAS	PITUITARY
PROSTATE	SPINAL CORD	SAL. GLAND MAND	SKIN
SPLEEN	STOMACH	SEMINAL VESICLES	THYMUS
THYROID GLANDS	TRACHEA	URINARY BLADDER	COAGULATING GL

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL, 2-MILD, 3-MODERATE, 4-SEVERE, P-PRESENT

SCHEDULED EUTHANASIA

PROJECT NO.:WIL-431014 INTER-LAB 15-DAY MALE RAT ASSAY WITH LINURON & PHENOBARBITAL
SPONSOR:BATTELLE INDIVIDUAL MACROSCOPIC AND MICROSCOPIC FINDINGS
SPONSOR NO.:68-W-01-023

ANIMAL NO. 97131 GROUP 5: 25 MG PHENO MALE SCHEDULED EUTH 11/07/05 DATE OF DEATH: 11/07/05

ORGAN WEIGHT	ABS.(G)	REL.	GRADE
LIVER	16.3301	4.332	
SEM VES/CG/FLUID	1.3025	0.345	
PROSTATE	0.9038	0.240	
EPIDIDYMIDES	0.9547	0.253	
TESTIS, RT	1.5006	0.398	
TESTIS, LT	1.5863	0.421	
THYROID GLANDS	0.0259	0.007	
FINAL BODY WT(G)	377.		

NO SIGNIFICANT CHANGES OBSERVED

GROSS:

ADRENAL GLANDS	BRAIN	EPIDIDYMIDES	ESOPHAGUS
EYES	HEART	INTESTINE	KIDNEYS
LIVER	LYMPH NODE, MES	LUNGS	MAMMARY GLAND
TESTIS, LT	TESTIS, RT	PANCREAS	PITUITARY
PROSTATE	SPINAL CORD	SAL. GLAND MAND	SKIN
SPLEEN	STOMACH	SEMINAL VESICLES	THYMUS
THYROID GLANDS	TRACHEA	URINARY BLADDER	COAGULATING GL

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL, 2-MILD, 3-MODERATE, 4-SEVERE, P-PRESENT

SCHEDULED EUTHANASIA

PROJECT NO.:WIL-431014 INTER-LAB 15-DAY MALE RAT ASSAY WITH LINURON & PHENOBARBITAL

SPONSOR:BATTELLE INDIVIDUAL MACROSCOPIC AND MICROSCOPIC FINDINGS

SPONSOR NO.:68-W-01-023

ANIMAL NO. 97133 GROUP 5: 25 MG PHENO MALE SCHEDULED EUTH 11/07/05 DATE OF DEATH: 11/07/05

ORGAN WEIGHT	ABS.(G)	REL.	GRADE
LIVER	17.6786	4.209	
SEM VES/CG/FLUID	1.5156	0.361	
PROSTATE	0.7958	0.189	
EPIDIDYMIDES	0.9804	0.233	
TESTIS, RT	1.6345	0.389	
TESTIS, LT	1.6198	0.386	
THYROID GLANDS	0.0237	0.006	
FINAL BODY WT(G)	420.		

NO SIGNIFICANT CHANGES OBSERVED

GROSS:

ADRENAL GLANDS	BRAIN	EPIDIDYMIDES	ESOPHAGUS
EYES	HEART	INTESTINE	KIDNEYS
LIVER	LYMPH NODE, MES	LUNGS	MAMMARY GLAND
TESTIS, LT	TESTIS, RT	PANCREAS	PITUITARY
PROSTATE	SPINAL CORD	SAL. GLAND MAND	SKIN
SPLEEN	STOMACH	SEMINAL VESICLES	THYMUS
THYROID GLANDS	TRACHEA	URINARY BLADDER	COAGULATING GL

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL, 2-MILD, 3-MODERATE, 4-SEVERE, P-PRESENT

ANIMAL NO. 97134 GROUP 5: 25 MG PHENO MALE SCHEDULED EUTH 11/07/05 DATE OF DEATH: 11/07/05

ORGAN WEIGHT	ABS.(G)	REL.	GRADE
LIVER	17.7439	4.527	
SEM VES/CG/FLUID	1.2636	0.322	
PROSTATE	0.4821	0.123	
EPIDIDYMIDES	0.9348	0.238	
TESTIS, RT	1.7146	0.437	
TESTIS, LT	1.6885	0.431	
THYROID GLANDS	0.0281	0.007	
FINAL BODY WT(G)	392.		

NO SIGNIFICANT CHANGES OBSERVED

GROSS:

ADRENAL GLANDS	BRAIN	EPIDIDYMIDES	ESOPHAGUS
EYES	HEART	INTESTINE	KIDNEYS
LIVER	LYMPH NODE, MES	LUNGS	MAMMARY GLAND
TESTIS, LT	TESTIS, RT	PANCREAS	PITUITARY
PROSTATE	SPINAL CORD	SAL. GLAND MAND	SKIN
SPLEEN	STOMACH	SEMINAL VESICLES	THYMUS
THYROID GLANDS	TRACHEA	URINARY BLADDER	COAGULATING GL

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL, 2-MILD, 3-MODERATE, 4-SEVERE, P-PRESENT

ANIMAL NO. 97141 GROUP 5: 25 MG PHENO MALE SCHEDULED EUTH 11/08/05 DATE OF DEATH: 11/08/05

ORGAN WEIGHT	ABS.(G)	REL.	GRADE
LIVER	15.2624	4.027	
SEM VES/CG/FLUID	1.8198	0.480	
PROSTATE	0.6676	0.176	
EPIDIDYMIDES	0.9628	0.254	
TESTIS, RT	1.6213	0.428	
TESTIS, LT	1.6286	0.430	
THYROID GLANDS	0.0251	0.007	
FINAL BODY WT(G)	379.		

NO SIGNIFICANT CHANGES OBSERVED

GROSS:

ADRENAL GLANDS	BRAIN	EPIDIDYMIDES	ESOPHAGUS
EYES	HEART	INTESTINE	KIDNEYS
LIVER	LYMPH NODE, MES	LUNGS	MAMMARY GLAND
TESTIS, LT	TESTIS, RT	PANCREAS	PITUITARY
PROSTATE	SPINAL CORD	SAL. GLAND MAND	SKIN
SPLEEN	STOMACH	SEMINAL VESICLES	THYMUS
THYROID GLANDS	TRACHEA	URINARY BLADDER	COAGULATING GL

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL, 2-MILD, 3-MODERATE, 4-SEVERE, P-PRESENT

ANIMAL NO. 97143 GROUP 5: 25 MG PHENO MALE SCHEDULED EUTH 11/08/05 DATE OF DEATH: 11/08/05

ORGAN WEIGHT	ABS.(G)	REL.	GRADE
LIVER	15.6572	4.301	
SEM VES/CG/FLUID	1.5412	0.423	
PROSTATE	0.7911	0.217	
EPIDIDYMIDES	0.9616	0.264	
TESTIS, RT	1.6166	0.444	
TESTIS, LT	1.6445	0.452	
THYROID GLANDS	0.0213	0.006	
FINAL BODY WT(G)	364.		

NO SIGNIFICANT CHANGES OBSERVED

GROSS:

ADRENAL GLANDS	BRAIN	EPIDIDYMIDES	ESOPHAGUS
EYES	HEART	INTESTINE	KIDNEYS
LIVER	LYMPH NODE, MES	LUNGS	MAMMARY GLAND
TESTIS, LT	TESTIS, RT	PANCREAS	PITUITARY
PROSTATE	SPINAL CORD	SAL. GLAND MAND	SKIN
SPLEEN	STOMACH	SEMINAL VESICLES	THYMUS
THYROID GLANDS	TRACHEA	URINARY BLADDER	COAGULATING GL

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL, 2-MILD, 3-MODERATE, 4-SEVERE, P-PRESENT

ANIMAL NO. 97151 GROUP 5: 25 MG PHENO MALE SCHEDULED EUTH 11/08/05 DATE OF DEATH: 11/08/05

ORGAN WEIGHT	ABS.(G)	REL.	GRADE
LIVER	17.9768	4.494	
SEM VES/CG/FLUID	1.8862	0.472	
PROSTATE	1.0443	0.261	
EPIDIDYMIDES	1.1733	0.293	
TESTIS, RT	1.6767	0.419	
TESTIS, LT	1.6836	0.421	
THYROID GLANDS	0.0248	0.006	
FINAL BODY WT(G)	400.		

NO SIGNIFICANT CHANGES OBSERVED

GROSS:

ADRENAL GLANDS	BRAIN	EPIDIDYMIDES	ESOPHAGUS
EYES	HEART	INTESTINE	KIDNEYS
LIVER	LYMPH NODE, MES	LUNGS	MAMMARY GLAND
TESTIS, LT	TESTIS, RT	PANCREAS	PITUITARY
PROSTATE	SPINAL CORD	SAL. GLAND MAND	SKIN
SPLEEN	STOMACH	SEMINAL VESICLES	THYMUS
THYROID GLANDS	TRACHEA	URINARY BLADDER	COAGULATING GL

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL, 2-MILD, 3-MODERATE, 4-SEVERE, P-PRESENT

SCHEDULED EUTHANASIA

PROJECT NO.:WIL-431014 INTER-LAB 15-DAY MALE RAT ASSAY WITH LINURON & PHENOBARBITAL

SPONSOR:BATTELLE INDIVIDUAL MACROSCOPIC AND MICROSCOPIC FINDINGS

SPONSOR NO.:68-W-01-023

ANIMAL NO. 97155 GROUP 5: 25 MG PHENO MALE SCHEDULED EUTH 11/08/05 DATE OF DEATH: 11/08/05

ORGAN WEIGHT	ABS.(G)	REL.	GRADE
LIVER	15.0180	4.551	
SEM VES/CG/FLUID	1.7192	0.521	
PROSTATE	0.8108	0.246	
EPIDIDYMIDES	0.9593	0.291	
TESTIS, RT	1.5305	0.464	
TESTIS, LT	1.5449	0.468	
THYROID GLANDS	0.0305	0.009	
FINAL BODY WT(G)	330.		

NO SIGNIFICANT CHANGES OBSERVED

GROSS:

ADRENAL GLANDS	BRAIN	EPIDIDYMIDES	ESOPHAGUS
EYES	HEART	INTESTINE	KIDNEYS
LIVER	LYMPH NODE, MES	LUNGS	MAMMARY GLAND
TESTIS, LT	TESTIS, RT	PANCREAS	PITUITARY
PROSTATE	SPINAL CORD	SAL. GLAND MAND	SKIN
SPLEEN	STOMACH	SEMINAL VESICLES	THYMUS
THYROID GLANDS	TRACHEA	URINARY BLADDER	COAGULATING GL

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL, 2-MILD, 3-MODERATE, 4-SEVERE, P-PRESENT

ANIMAL NO. 97173 GROUP 5: 25 MG PHENO MALE SCHEDULED EUTH 11/08/05 DATE OF DEATH: 11/08/05

ORGAN WEIGHT	ABS.(G)	REL.	GRADE
LIVER	19.7581	4.693	
SEM VES/CG/FLUID	1.9053	0.453	
PROSTATE	1.1363	0.270	
EPIDIDYMIDES	1.1648	0.277	
TESTIS, RT	1.7707	0.421	
TESTIS, LT	1.8441	0.438	
THYROID GLANDS	0.0234	0.006	
FINAL BODY WT(G)	421.		

NO SIGNIFICANT CHANGES OBSERVED

GROSS:				
ADRENAL GLANDS	BRAIN	EPIDIDYMIDES	ESOPHAGUS	
EYES	HEART	INTESTINE	KIDNEYS	
LIVER	LYMPH NODE, MES	LUNGS	MAMMARY GLAND	
TESTIS, LT	TESTIS, RT	PANCREAS	PITUITARY	
PROSTATE	SPINAL CORD	SAL. GLAND MAND	SKIN	
SPLEEN	STOMACH	SEMINAL VESICLES	THYMUS	
THYROID GLANDS	TRACHEA	URINARY BLADDER	COAGULATING GL	

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL, 2-MILD, 3-MODERATE, 4-SEVERE, P-PRESENT

SCHEDULED EUTHANASIA

PROJECT NO.:WIL-431014 INTER-LAB 15-DAY MALE RAT ASSAY WITH LINURON & PHENOBARBITAL

SPONSOR:BATTELLE INDIVIDUAL MACROSCOPIC AND MICROSCOPIC FINDINGS

SPONSOR NO.:68-W-01-023

ANIMAL NO. 97180 GROUP 5: 25 MG PHENO MALE SCHEDULED EUTH 11/09/05 DATE OF DEATH: 11/09/05

ORGAN WEIGHT	ABS.(G)	REL.	GRADE
LIVER	17.8297	4.560	NO SIGNIFICANT
SEM VES/CG/FLUID	1.9885	0.509	CHANGES OBSERVED
PROSTATE	0.8669	0.222	
EPIDIDYMIDES	0.9220	0.236	
TESTIS, RT	1.6877	0.432	
TESTIS, LT	1.6666	0.426	
THYROID GLANDS	0.0294	0.008	
FINAL BODY WT(G)	391.		

GROSS:				
ADRENAL GLANDS	BRAIN	EPIDIDYMIDES	ESOPHAGUS	
EYES	HEART	INTESTINE	KIDNEYS	
LIVER	LYMPH NODE, MES	LUNGS	MAMMARY GLAND	
TESTIS, LT	TESTIS, RT	PANCREAS	PITUITARY	
PROSTATE	SPINAL CORD	SAL. GLAND MAND	SKIN	
SPLEEN	STOMACH	SEMINAL VESICLES	THYMUS	
THYROID GLANDS	TRACHEA	URINARY BLADDER	COAGULATING GL	

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL, 2-MILD, 3-MODERATE, 4-SEVERE, P-PRESENT

ANIMAL NO. 97186 GROUP 5: 25 MG PHENO MALE SCHEDULED EUTH 11/09/05 DATE OF DEATH: 11/09/05

ORGAN WEIGHT	ABS.(G)	REL.	GRADE
LIVER	15.3606	4.339	
SEM VES/CG/FLUID	1.4716	0.416	
PROSTATE	0.7637	0.216	
EPIDIDYMIDES	1.1133	0.314	
TESTIS, RT	1.6341	0.462	
TESTIS, LT	1.5602	0.441	
THYROID GLANDS	0.0287	0.008	
FINAL BODY WT(G)	354.		

NO SIGNIFICANT CHANGES OBSERVED

GROSS:

ADRENAL GLANDS	BRAIN	EPIDIDYMIDES	ESOPHAGUS
EYES	HEART	INTESTINE	KIDNEYS
LIVER	LYMPH NODE, MES	LUNGS	MAMMARY GLAND
TESTIS, LT	TESTIS, RT	PANCREAS	PITUITARY
PROSTATE	SPINAL CORD	SAL. GLAND MAND	SKIN
SPLEEN	STOMACH	SEMINAL VESICLES	THYMUS
THYROID GLANDS	TRACHEA	URINARY BLADDER	COAGULATING GL

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL, 2-MILD, 3-MODERATE, 4-SEVERE, P-PRESENT

ANIMAL NO. 97218 GROUP 5: 25 MG PHENO MALE SCHEDULED EUTH 11/09/05 DATE OF DEATH: 11/09/05

ORGAN WEIGHT	ABS.(G)	REL.	GRADE
LIVER	17.8800	4.372	
SEM VES/CG/FLUID	1.6230	0.397	
PROSTATE	0.8935	0.218	
EPIDIDYMIDES	1.0729	0.262	
TESTIS, RT	1.8469	0.452	
TESTIS, LT	1.9068	0.466	
THYROID GLANDS	0.0307	0.008	
FINAL BODY WT(G)	409.		

NO SIGNIFICANT CHANGES OBSERVED GROSS:

ADRENAL GLANDS	BRAIN	EPIDIDYMIDES	ESOPHAGUS
EYES	HEART	INTESTINE	KIDNEYS
LIVER	LYMPH NODE, MES	LUNGS	MAMMARY GLAND
TESTIS, LT	TESTIS, RT	PANCREAS	PITUITARY
PROSTATE	SPINAL CORD	SAL. GLAND MAND	SKIN
SPLEEN	STOMACH	SEMINAL VESICLES	THYMUS
THYROID GLANDS	TRACHEA	URINARY BLADDER	COAGULATING GL

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL, 2-MILD, 3-MODERATE, 4-SEVERE, P-PRESENT

SCHEDULED EUTHANASIA

PROJECT NO.:WIL-431014 INTER-LAB 15-DAY MALE RAT ASSAY WITH LINURON & PHENOBARBITAL

SPONSOR:BATTELLE INDIVIDUAL MACROSCOPIC AND MICROSCOPIC FINDINGS

SPONSOR NO.:68-W-01-023

ANIMAL NO. 97233 GROUP 5: 25 MG PHENO MALE SCHEDULED EUTH 11/09/05 DATE OF DEATH: 11/09/05

ORGAN WEIGHT	ABS.(G)	REL.	GRADE
LIVER	16.9987	4.271	
SEM VES/CG/FLUID	1.5238	0.383	
PROSTATE	0.8658	0.218	
EPIDIDYMIDES	0.9760	0.245	
TESTIS, RT	1.6840	0.423	
TESTIS, LT	1.6306	0.410	
THYROID GLANDS	0.0241	0.006	
FINAL BODY WT(G)	398.		

NO SIGNIFICANT CHANGES OBSERVED

GROSS:

ADRENAL GLANDS	BRAIN	EPIDIDYMIDES	ESOPHAGUS
EYES	HEART	INTESTINE	KIDNEYS
LIVER	LYMPH NODE, MES	LUNGS	MAMMARY GLAND
TESTIS, LT	TESTIS, RT	PANCREAS	PITUITARY
PROSTATE	SPINAL CORD	SAL. GLAND MAND	SKIN
SPLEEN	STOMACH	SEMINAL VESICLES	THYMUS
THYROID GLANDS	TRACHEA	URINARY BLADDER	COAGULATING GL

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL, 2-MILD, 3-MODERATE, 4-SEVERE, P-PRESENT

ANIMAL NO. 97235 GROUP 5: 25 MG PHENO MALE SCHEDULED EUTH 11/09/05 DATE OF DEATH: 11/09/05

ORGAN WEIGHT	ABS.(G)	REL.	GRADE
LIVER	16.4516	4.621	
SEM VES/CG/FLUID	1.3539	0.380	
PROSTATE	0.5688	0.160	
EPIDIDYMIDES	0.9051	0.254	
TESTIS, RT	1.4680	0.412	
TESTIS, LT	1.4521	0.408	
THYROID GLANDS	0.0260	0.007	
FINAL BODY WT(G)	356.		

NO SIGNIFICANT CHANGES OBSERVED

GROSS:

ADRENAL GLANDS	BRAIN	EPIDIDYMIDES	ESOPHAGUS
EYES	HEART	INTESTINE	KIDNEYS
LIVER	LYMPH NODE, MES	LUNGS	MAMMARY GLAND
TESTIS, LT	TESTIS, RT	PANCREAS	PITUITARY
PROSTATE	SPINAL CORD	SAL. GLAND MAND	SKIN
SPLEEN	STOMACH	SEMINAL VESICLES	THYMUS
THYROID GLANDS	TRACHEA	URINARY BLADDER	COAGULATING GL

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL, 2-MILD, 3-MODERATE, 4-SEVERE, P-PRESENT

ANIMAL NO. 97123 GROUP 6: 50 MG PHENO MALE SCHEDULED EUTH 11/07/05 DATE OF DEATH: 11/07/05

ORGAN WEIGHT	ABS.(G)	REL.	GRADE
LIVER	16.8052	4.493	
SEM VES/CG/FLUID	1.8104	0.484	
PROSTATE	0.9909	0.265	
EPIDIDYMIDES	0.9501	0.254	
TESTIS, RT	1.5904	0.425	
TESTIS, LT	1.6323	0.436	
THYROID GLANDS	0.0199	0.005	
FINAL BODY WT(G)	374.		

NO SIGNIFICANT CHANGES OBSERVED

GROSS:

ADRENAL GLANDS	BRAIN	EPIDIDYMIDES	ESOPHAGUS
EYES	HEART	INTESTINE	KIDNEYS
LIVER	LYMPH NODE, MES	LUNGS	MAMMARY GLAND
TESTIS, LT	TESTIS, RT	PANCREAS	PITUITARY
PROSTATE	SPINAL CORD	SAL. GLAND MAND	SKIN
SPLEEN	STOMACH	SEMINAL VESICLES	THYMUS
THYROID GLANDS	TRACHEA	URINARY BLADDER	COAGULATING GL

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL, 2-MILD, 3-MODERATE, 4-SEVERE, P-PRESENT

ANIMAL NO. 97129 GROUP 6: 50 MG PHENO MALE SCHEDULED EUTH 11/07/05 DATE OF DEATH: 11/07/05

ORGAN WEIGHT	ABS.(G)	REL.	GRADE
LIVER	18.2043	4.842	
SEM VES/CG/FLUID	1.8007	0.479	
PROSTATE	0.7686	0.204	
EPIDIDYMIDES	1.1038	0.294	
TESTIS, RT	1.5638	0.416	
TESTIS, LT	1.5631	0.416	
THYROID GLANDS	0.0240	0.006	
FINAL BODY WT(G)	376.		

NO SIGNIFICANT CHANGES OBSERVED

GROSS:

ADRENAL GLANDS	BRAIN	EPIDIDYMIDES	ESOPHAGUS
EYES	HEART	INTESTINE	KIDNEYS
LIVER	LYMPH NODE, MES	LUNGS	MAMMARY GLAND
TESTIS, LT	TESTIS, RT	PANCREAS	PITUITARY
PROSTATE	SPINAL CORD	SAL. GLAND MAND	SKIN
SPLEEN	STOMACH	SEMINAL VESICLES	THYMUS
THYROID GLANDS	TRACHEA	URINARY BLADDER	COAGULATING GL

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL, 2-MILD, 3-MODERATE, 4-SEVERE, P-PRESENT

ANIMAL NO. 97135 GROUP 6: 50 MG PHENO MALE SCHEDULED EUTH 11/07/05 DATE OF DEATH: 11/07/05

ORGAN WEIGHT	ABS.(G)	REL.	GRADE
LIVER	18.3293	4.749	
SEM VES/CG/FLUID	1.6272	0.422	
PROSTATE	0.9622	0.249	
EPIDIDYMIDES	1.0165	0.263	
TESTIS, RT	1.7999	0.466	
TESTIS, LT	1.7126	0.444	
THYROID GLANDS	0.0236	0.006	
FINAL BODY WT(G)	386.		

NO SIGNIFICANT CHANGES OBSERVED

GROSS:

ADRENAL GLANDS	BRAIN	EPIDIDYMIDES	ESOPHAGUS	
EYES	HEART	INTESTINE	KIDNEYS	
LIVER	LYMPH NODE, MES	LUNGS	MAMMARY GLAND	
TESTIS, LT	TESTIS, RT	PANCREAS	PITUITARY	
PROSTATE	SPINAL CORD	SAL. GLAND MAND	SKIN	
SPLEEN	STOMACH	SEMINAL VESICLES	THYMUS	
THYROID GLANDS	TRACHEA	URINARY BLADDER	COAGULATING GL	

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL, 2-MILD, 3-MODERATE, 4-SEVERE, P-PRESENT

ANIMAL NO. 97139 GROUP 6: 50 MG PHENO MALE SCHEDULED EUTH 11/07/05 DATE OF DEATH: 11/07/05

ORGAN WEIGHT	ABS.(G)	REL.	GRADE
LIVER	17.6991	4.707	
SEM VES/CG/FLUID	1.3847	0.368	
PROSTATE	0.8907	0.237	
EPIDIDYMIDES	0.8576	0.228	
TESTIS, RT	1.3810	0.367	
TESTIS, LT	1.4173	0.377	
THYROID GLANDS	0.0279	0.007	
FINAL BODY WT(G)	376.		

NO SIGNIFICANT CHANGES OBSERVED

GROSS:

ADRENAL GLANDS	BRAIN	EPIDIDYMIDES	ESOPHAGUS
EYES	HEART	INTESTINE	KIDNEYS
LIVER	LYMPH NODE, MES	LUNGS	MAMMARY GLAND
TESTIS, LT	TESTIS, RT	PANCREAS	PITUITARY
PROSTATE	SPINAL CORD	SAL. GLAND MAND	SKIN
SPLEEN	STOMACH	SEMINAL VESICLES	THYMUS
THYROID GLANDS	TRACHEA	URINARY BLADDER	COAGULATING GL

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL, 2-MILD, 3-MODERATE, 4-SEVERE, P-PRESENT

ANIMAL NO. 97146 GROUP 6: 50 MG PHENO MALE SCHEDULED EUTH 11/07/05 DATE OF DEATH: 11/07/05

ORGAN WEIGHT	ABS.(G)	REL.	GRADE
LIVER	18.2170	4.554	
SEM VES/CG/FLUID	1.4654	0.366	
PROSTATE	0.8992	0.225	
EPIDIDYMIDES	1.1001	0.275	
TESTIS, RT	1.6966	0.424	
TESTIS, LT	1.6572	0.414	
THYROID GLANDS	0.0269	0.007	
FINAL BODY WT(G)	400.		

NO SIGNIFICANT CHANGES OBSERVED

GROSS:

ADRENAL GLANDS	BRAIN	EPIDIDYMIDES	ESOPHAGUS
EYES	HEART	INTESTINE	KIDNEYS
LIVER	LYMPH NODE, MES	LUNGS	MAMMARY GLAND
TESTIS, LT	TESTIS, RT	PANCREAS	PITUITARY
PROSTATE	SPINAL CORD	SAL. GLAND MAND	SKIN
SPLEEN	STOMACH	SEMINAL VESICLES	THYMUS
THYROID GLANDS	TRACHEA	URINARY BLADDER	COAGULATING GL

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL, 2-MILD, 3-MODERATE, 4-SEVERE, P-PRESENT

ANIMAL NO. 97149 GROUP 6: 50 MG PHENO MALE SCHEDULED EUTH 11/08/05 DATE OF DEATH: 11/08/05

ORGAN WEIGHT	ABS.(G)	REL.	GRADE
LIVER	17.9682	4.595	
SEM VES/CG/FLUID	1.4591	0.373	
PROSTATE	0.6521	0.167	
EPIDIDYMIDES	0.9995	0.256	
TESTIS, RT	1.5061	0.385	
TESTIS, LT	1.5482	0.396	
THYROID GLANDS	0.0300	0.008	
FINAL BODY WT(G)	391.		

NO SIGNIFICANT CHANGES OBSERVED

GROSS:

ADRENAL GLANDS	BRAIN	EPIDIDYMIDES	ESOPHAGUS
EYES	HEART	INTESTINE	KIDNEYS
LIVER	LYMPH NODE, MES	LUNGS	MAMMARY GLAND
TESTIS, LT	TESTIS, RT	PANCREAS	PITUITARY
PROSTATE	SPINAL CORD	SAL. GLAND MAND	SKIN
SPLEEN	STOMACH	SEMINAL VESICLES	THYMUS
THYROID GLANDS	TRACHEA	URINARY BLADDER	COAGULATING GL

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL, 2-MILD, 3-MODERATE, 4-SEVERE, P-PRESENT

ANIMAL NO. 97183 GROUP 6: 50 MG PHENO MALE SCHEDULED EUTH 11/08/05 DATE OF DEATH: 11/08/05

ORGAN WEIGHT	ABS.(G)	REL.	GRADE
LIVER	17.4959	4.691	
SEM VES/CG/FLUID	1.5344	0.411	
PROSTATE	0.7537	0.202	
EPIDIDYMIDES	0.9643	0.259	
TESTIS, RT	1.5445	0.414	
TESTIS, LT	1.5495	0.415	
THYROID GLANDS	0.0214	0.006	
FINAL BODY WT(G)	373.		

NO SIGNIFICANT CHANGES OBSERVED

GROSS:

ADRENAL GLANDS	BRAIN	EPIDIDYMIDES	ESOPHAGUS
EYES	HEART	INTESTINE	KIDNEYS
LIVER	LYMPH NODE, MES	LUNGS	MAMMARY GLAND
TESTIS, LT	TESTIS, RT	PANCREAS	PITUITARY
PROSTATE	SPINAL CORD	SAL. GLAND MAND	SKIN
SPLEEN	STOMACH	SEMINAL VESICLES	THYMUS
THYROID GLANDS	TRACHEA	URINARY BLADDER	COAGULATING GL

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL, 2-MILD, 3-MODERATE, 4-SEVERE, P-PRESENT

ANIMAL NO. 97190 GROUP 6: 50 MG PHENO MALE SCHEDULED EUTH 11/08/05 DATE OF DEATH: 11/08/05

ORGAN WEIGHT	ABS.(G)	REL.	GRADE
LIVER	20.7030	4.883	
SEM VES/CG/FLUID	2.0360	0.480	
PROSTATE	0.8305	0.196	
EPIDIDYMIDES	1.0981	0.259	
TESTIS, RT	1.8179	0.429	
TESTIS, LT	1.8185	0.429	
THYROID GLANDS	0.0267	0.006	
FINAL BODY WT(G)	424.		

NO SIGNIFICANT CHANGES OBSERVED

GROSS:

ADRENAL GLANDS	BRAIN	EPIDIDYMIDES	ESOPHAGUS
EYES	HEART	INTESTINE	KIDNEYS
LIVER	LYMPH NODE, MES	LUNGS	MAMMARY GLAND
TESTIS, LT	TESTIS, RT	PANCREAS	PITUITARY
PROSTATE	SPINAL CORD	SAL. GLAND MAND	SKIN
SPLEEN	STOMACH	SEMINAL VESICLES	THYMUS
THYROID GLANDS	TRACHEA	URINARY BLADDER	COAGULATING GL

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL, 2-MILD, 3-MODERATE, 4-SEVERE, P-PRESENT

ANIMAL NO. 97195 GROUP 6: 50 MG PHENO MALE SCHEDULED EUTH 11/08/05 DATE OF DEATH: 11/08/05

ORGAN WEIGHT	ABS.(G)	REL.	GRADE
LIVER	15.6544	4.397	
SEM VES/CG/FLUID	1.5881	0.446	
PROSTATE	0.9022	0.253	
EPIDIDYMIDES	1.0990	0.309	
TESTIS, RT	1.6624	0.467	
TESTIS, LT	1.6597	0.466	
THYROID GLANDS	0.0259	0.007	
FINAL BODY WT(G)	356.		

NO SIGNIFICANT CHANGES OBSERVED

GROSS:

ADRENAL GLANDS	BRAIN	EPIDIDYMIDES	ESOPHAGUS
EYES	HEART	INTESTINE	KIDNEYS
LIVER	LYMPH NODE, MES	LUNGS	MAMMARY GLAND
TESTIS, LT	TESTIS, RT	PANCREAS	PITUITARY
PROSTATE	SPINAL CORD	SAL. GLAND MAND	SKIN
SPLEEN	STOMACH	SEMINAL VESICLES	THYMUS
THYROID GLANDS	TRACHEA	URINARY BLADDER	COAGULATING GL

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL, 2-MILD, 3-MODERATE, 4-SEVERE, P-PRESENT

ANIMAL NO. 97203 GROUP 6: 50 MG PHENO MALE SCHEDULED EUTH 11/08/05 DATE OF DEATH: 11/08/05

ORGAN WEIGHT	ABS.(G)	REL.	GRADE
LIVER	20.0905	4.985	
SEM VES/CG/FLUID	1.8461	0.458	
PROSTATE	0.7712	0.191	
EPIDIDYMIDES	1.0033	0.249	
TESTIS, RT	1.9341	0.480	
TESTIS, LT	1.9108	0.474	
THYROID GLANDS	0.0294	0.007	
FINAL BODY WT(G)	403.		

NO SIGNIFICANT CHANGES OBSERVED

GROSS:

ADRENAL GLANDS	BRAIN	EPIDIDYMIDES	ESOPHAGUS	
EYES	HEART	INTESTINE	KIDNEYS	
LIVER	LYMPH NODE, MES	LUNGS	MAMMARY GLAND	
TESTIS, LT	TESTIS, RT	PANCREAS	PITUITARY	
PROSTATE	SPINAL CORD	SAL. GLAND MAND	SKIN	
SPLEEN	STOMACH	SEMINAL VESICLES	THYMUS	
THYROID GLANDS	TRACHEA	URINARY BLADDER	COAGULATING GL	

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL, 2-MILD, 3-MODERATE, 4-SEVERE, P-PRESENT

ANIMAL NO. 97215 GROUP 6: 50 MG PHENO MALE SCHEDULED EUTH 11/09/05 DATE OF DEATH: 11/09/05

ORGAN WEIGHT	ABS.(G)	REL.	GRADE
LIVER	21.2073	5.262	
SEM VES/CG/FLUID	1.8263	0.453	
PROSTATE	1.0520	0.261	
EPIDIDYMIDES	1.1426	0.284	
TESTIS, RT	1.6825	0.417	
TESTIS, LT	1.6344	0.406	
THYROID GLANDS	0.0317	0.008	
FINAL BODY WT(G)	403.		

NO SIGNIFICANT CHANGES OBSERVED

GROSS:

ADRENAL GLANDS	BRAIN	EPIDIDYMIDES	ESOPHAGUS
EYES	HEART	INTESTINE	KIDNEYS
LIVER	LYMPH NODE, MES	LUNGS	MAMMARY GLAND
TESTIS, LT	TESTIS, RT	PANCREAS	PITUITARY
PROSTATE	SPINAL CORD	SAL. GLAND MAND	SKIN
SPLEEN	STOMACH	SEMINAL VESICLES	THYMUS
THYROID GLANDS	TRACHEA	URINARY BLADDER	COAGULATING GL

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL, 2-MILD, 3-MODERATE, 4-SEVERE, P-PRESENT

ANIMAL NO. 97228 GROUP 6: 50 MG PHENO MALE SCHEDULED EUTH 11/09/05 DATE OF DEATH: 11/09/05

ORGAN WEIGHT	ABS.(G)	REL.	GRADE
LIVER	17.9913	5.040	
SEM VES/CG/FLUID	1.8667	0.523	
PROSTATE	0.9149	0.256	
EPIDIDYMIDES	1.0411	0.292	
TESTIS, RT	1.4467	0.405	
TESTIS, LT	1.4599	0.409	
THYROID GLANDS	0.0328	0.009	
FINAL BODY WT(G)	357.		

NO SIGNIFICANT CHANGES OBSERVED

GROSS:

ADRENAL GLANDS	BRAIN	EPIDIDYMIDES	ESOPHAGUS
EYES	HEART	INTESTINE	KIDNEYS
LIVER	LYMPH NODE, MES	LUNGS	MAMMARY GLAND
TESTIS, LT	TESTIS, RT	PANCREAS	PITUITARY
PROSTATE	SPINAL CORD	SAL. GLAND MAND	SKIN
SPLEEN	STOMACH	SEMINAL VESICLES	THYMUS
THYROID GLANDS	TRACHEA	URINARY BLADDER	COAGULATING GL

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL, 2-MILD, 3-MODERATE, 4-SEVERE, P-PRESENT

ANIMAL NO. 97229 GROUP 6: 50 MG PHENO MALE SCHEDULED EUTH 11/09/05 DATE OF DEATH: 11/09/05

ORGAN WEIGHT	ABS.(G)	REL.	GRADE
LIVER	16.4548	4.715	
SEM VES/CG/FLUID	1.8560	0.532	
PROSTATE	1.0214	0.293	
EPIDIDYMIDES	1.1370	0.326	
TESTIS, RT	1.7017	0.488	
TESTIS, LT	1.6177	0.464	
THYROID GLANDS	0.0227	0.007	
FINAL BODY WT(G)	349.		

NO SIGNIFICANT CHANGES OBSERVED

GROSS:

ADRENAL GLANDS	BRAIN	EPIDIDYMIDES	ESOPHAGUS
EYES	HEART	INTESTINE	KIDNEYS
LIVER	LYMPH NODE, MES	LUNGS	MAMMARY GLAND
TESTIS, LT	TESTIS, RT	PANCREAS	PITUITARY
PROSTATE	SPINAL CORD	SAL. GLAND MAND	SKIN
SPLEEN	STOMACH	SEMINAL VESICLES	THYMUS
THYROID GLANDS	TRACHEA	URINARY BLADDER	COAGULATING GL

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL, 2-MILD, 3-MODERATE, 4-SEVERE, P-PRESENT

ANIMAL NO. 97230 GROUP 6: 50 MG PHENO MALE SCHEDULED EUTH 11/09/05 DATE OF DEATH: 11/09/05

ORGAN WEIGHT	ABS.(G)	REL.	GRADE
LIVER	17.4829	4.790	
SEM VES/CG/FLUID	1.6126	0.442	
PROSTATE	0.7836	0.215	
EPIDIDYMIDES	1.0063	0.276	
TESTIS, RT	1.6139	0.442	
TESTIS, LT	1.5487	0.424	
THYROID GLANDS	0.0258	0.007	
FINAL BODY WT(G)	365.		

NO SIGNIFICANT CHANGES OBSERVED

GROSS:

ADRENAL GLANDS	BRAIN	EPIDIDYMIDES	ESOPHAGUS
EYES	HEART	INTESTINE	KIDNEYS
LIVER	LYMPH NODE, MES	LUNGS	MAMMARY GLAND
TESTIS, LT	TESTIS, RT	PANCREAS	PITUITARY
PROSTATE	SPINAL CORD	SAL. GLAND MAND	SKIN
SPLEEN	STOMACH	SEMINAL VESICLES	THYMUS
THYROID GLANDS	TRACHEA	URINARY BLADDER	COAGULATING GL

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL, 2-MILD, 3-MODERATE, 4-SEVERE, P-PRESENT

ANIMAL NO. 97232 GROUP 6: 50 MG PHENO MALE SCHEDULED EUTH 11/09/05 DATE OF DEATH: 11/09/05

ORGAN WEIGHT	ABS.(G)	REL.
LIVER	18.9355	5.023
SEM VES/CG/FLUID	1.5799	0.419
PROSTATE	0.8085	0.214
EPIDIDYMIDES	0.8323	0.221
TESTIS, RT	2.0561	0.545
TESTIS, LT	0.3152	0.084
THYROID GLANDS	0.0285	0.008
FINAL BODY WT(G)	377.	

EPIDIDYMIDES — GROSS: SMALL — GRADE P
TESTIS, LT — GROSS: SMALL — GRADE P
NO SIGNIFICANT CHANGES OBSERVED

GROSS: LEFT

ADRENAL GLANDS	BRAIN	ESOPHAGUS	EYES
HEART	INTESTINE	KIDNEYS	LIVER
LYMPH NODE, MES	LUNGS	MAMMARY GLAND	TESTIS, RT
PANCREAS	PITUITARY	PROSTATE	SPINAL CORD
SAL. GLAND MAND	SKIN	SPLEEN	STOMACH
SEMINAL VESICLES	THYMUS	THYROID GLANDS	TRACHEA
URINARY BLADDER	COAGULATING GL		

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL, 2-MILD, 3-MODERATE, 4-SEVERE, P-PRESENT

ANIMAL NO. 97120 GROUP 7: 100 MG PHENO MALE SCHEDULED EUTH 11/07/05 DATE OF DEATH: 11/07/05

ORGAN WEIGHT	ABS.(G)	REL.
LIVER	18.0452	5.156
SEM VES/CG/FLUID	1.4848	0.424
PROSTATE	0.5521	0.158
EPIDIDYMIDES	0.9889	0.283
TESTIS, RT	1.3480	0.385
TESTIS, LT	1.3873	0.396
THYROID GLANDS	0.0221	0.006
FINAL BODY WT(G)	350.	

		GRADE
EPIDIDYMIDES	MICRO: INFILTRATE, MONONUCLEAR MULTIFOCAL	1
	LUMINAL DEBRIS, CELLULAR BILATERAL	1
THYROID GLANDS	MICRO: FOLLICULAR EPITHELIAL HEIGHT BILATERAL	4
	COLLOID AREA BILATERAL	2
	CYST, ULTIMOBRANCHIAL MULTIFOCAL, UNILATERAL	1
	MITOTIC FIGURES MULTIFOCAL, BILATERAL	2
TESTES	MICRO: RETENTION, SPERMATIDS MULTIFOCAL, BILATERAL	1

NO SIGNIFICANT CHANGES OBSERVED

GROSS:

ADRENAL GLANDS	BRAIN	EPIDIDYMIDES	ESOPHAGUS
EYES	HEART	INTESTINE	KIDNEYS
LIVER	LYMPH NODE, MES	LUNGS	MAMMARY GLAND
TESTIS, LT	TESTIS, RT	PANCREAS	PITUITARY
PROSTATE	SPINAL CORD	SAL. GLAND MAND	SKIN
SPLEEN	STOMACH	SEMINAL VESICLES	THYMUS
THYROID GLANDS	TRACHEA	URINARY BLADDER	COAGULATING GL

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL, 2-MILD, 3-MODERATE, 4-SEVERE, P-PRESENT

ANIMAL NO. 97130 GROUP 7: 100 MG PHENO MALE SCHEDULED EUTH 11/07/05 DATE OF DEATH: 11/07/05

ORGAN WEIGHT	ABS.(G)	REL.
LIVER	20.7555	5.686
SEM VES/CG/FLUID	1.8905	0.518
PROSTATE	0.9084	0.249
EPIDIDYMIDES	1.0222	0.280
TESTIS, RT	1.6187	0.443
TESTIS, LT	1.6894	0.463
THYROID GLANDS	0.0287	0.008
FINAL BODY WT(G)	365.	

		GRADE
EPIDIDYMIDES	MICRO: INFILTRATE, MONONUCLEAR	
	MULTIFOCAL	1
SPLEEN	GROSS: ENLARGED	
	50 X 11 X 5 MM	P
THYROID GLANDS	MICRO: FOLLICULAR EPITHELIAL HEIGHT	
	BILATERAL	3
	COLLOID AREA	
	BILATERAL	3
	CYST, ULTIMOBRANCHIAL	
	MULTIFOCAL, BILATERAL	1
	MITOTIC FIGURES	
	MULTIFOCAL, BILATERAL	1

NO SIGNIFICANT CHANGES OBSERVED

GROSS:

ADRENAL GLANDS	BRAIN	EPIDIDYMIDES	ESOPHAGUS
EYES	HEART	INTESTINE	KIDNEYS
LIVER	LYMPH NODE, MES	LUNGS	MAMMARY GLAND
TESTIS, LT	TESTIS, RT	PANCREAS	PITUITARY
PROSTATE	SPINAL CORD	SAL. GLAND MAND	SKIN
STOMACH	SEMINAL VESICLES	THYMUS	THYROID GLANDS
TRACHEA	URINARY BLADDER	COAGULATING GL	

MICRO: TESTES

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL, 2-MILD, 3-MODERATE, 4-SEVERE, P-PRESENT

ANIMAL NO. 97145 GROUP 7: 100 MG PHENO MALE SCHEDULED EUTH 11/07/05 DATE OF DEATH: 11/07/05

ORGAN WEIGHT	ABS.(G)	REL.
LIVER	14.6807	4.449
SEM VES/CG/FLUID	1.8173	0.551
PROSTATE	0.5946	0.180
EPIDIDYMIDES	0.8538	0.259
TESTIS, RT	1.4209	0.431
TESTIS, LT	1.4690	0.445
THYROID GLANDS	0.0191	0.006
FINAL BODY WT(G)	330.	

			GRADE
EPIDIDYMIDES	MICRO:	INFILTRATE, MONONUCLEAR MULTIFOCAL	1
		LUMINAL DEBRIS, CELLULAR BILATERAL	1
THYROID GLANDS	MICRO:	FOLLICULAR EPITHELIAL HEIGHT BILATERAL	3
		COLLOID AREA BILATERAL	2
		CYST, ULTIMOBRANCHIAL MULTIFOCAL, UNILATERAL	1
		MITOTIC FIGURES MULTIFOCAL, BILATERAL	1
COAGULATING GL	GROSS:	ENLARGED BILATERAL	P
TESTES	MICRO:	DEGENERATION, SEMINIFEROUS TUBULES MULTIFOCAL, BILATERAL	1
		RETENTION, SPERMATIDS MULTIFOCAL, BILATERAL	1
		VACUOLATION, SEMINIFEROUS EPITHELIUM MULTIFOCAL, BILATERAL	1
NO SIGNIFICANT CHANGES OBSERVED	GROSS:	ADRENAL GLANDS, BRAIN, EPIDIDYMIDES, ESOPHAGUS, EYES, HEART, INTESTINE, KIDNEYS	

ANIMAL NO. 97145 GROUP 7: 100 MG PHENO MALE SCHEDULED EUTH 11/07/05 DATE OF DEATH: 11/07/05

GRADE

LIVER	LYMPH NODE, MES	LUNGS	MAMMARY GLAND
TESTIS, LT	TESTIS, RT	PANCREAS	PITUITARY
PROSTATE	SPINAL CORD	SAL. GLAND MAND	SKIN
SPLEEN	STOMACH	SEMINAL VESICLES	THYMUS
THYROID GLANDS	TRACHEA	URINARY BLADDER	

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL, 2-MILD, 3-MODERATE, 4-SEVERE, P-PRESENT

ANIMAL NO. 97154 GROUP 7: 100 MG PHENO MALE SCHEDULED EUTH 11/07/05 DATE OF DEATH: 11/07/05

ORGAN WEIGHT	ABS.(G)	REL.
LIVER	17.1305	4.745
SEM VES/CG/FLUID	1.6258	0.450
PROSTATE	0.8845	0.245
EPIDIDYMIDES	1.1033	0.306
TESTIS, RT	1.7761	0.492
TESTIS, LT	1.7516	0.485
THYROID GLANDS	0.0237	0.007
FINAL BODY WT(G)	361.	

		GRADE
EPIDIDYMIDES	MICRO: INFILTRATE, MONONUCLEAR MULTIFOCAL	1
THYROID GLANDS	MICRO: FOLLICULAR EPITHELIAL HEIGHT BILATERAL	2
	COLLOID AREA BILATERAL	2
	CYST, ULTIMOBRANCHIAL FOCAL, UNILATERAL	1
	MITOTIC FIGURES MULTIFOCAL, BILATERAL	1
TESTES	MICRO: RETENTION, SPERMATIDS MULTIFOCAL, BILATERAL	1

NO SIGNIFICANT CHANGES OBSERVED

GROSS:

ADRENAL GLANDS	BRAIN	EPIDIDYMIDES	ESOPHAGUS
EYES	HEART	INTESTINE	KIDNEYS
LIVER	LYMPH NODE, MES	LUNGS	MAMMARY GLAND
TESTIS, LT	TESTIS, RT	PANCREAS	PITUITARY
PROSTATE	SPINAL CORD	SAL. GLAND MAND	SKIN
SPLEEN	STOMACH	SEMINAL VESICLES	THYMUS
THYROID GLANDS	TRACHEA	URINARY BLADDER	COAGULATING GL

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL, 2-MILD, 3-MODERATE, 4-SEVERE, P-PRESENT

ANIMAL NO. 97158 GROUP 7: 100 MG PHENO MALE SCHEDULED EUTH 11/07/05 DATE OF DEATH: 11/07/05

ORGAN WEIGHT	ABS.(G)	REL.
LIVER	17.5723	5.035
SEM VES/CG/FLUID	1.5223	0.436
PROSTATE	0.7934	0.227
EPIDIDYMIDES	1.1141	0.319
TESTIS, RT	1.6691	0.478
TESTIS, LT	1.6285	0.467
THYROID GLANDS	0.0196	0.006
FINAL BODY WT(G)	349.	

		GRADE
EPIDIDYMIDES	MICRO: INFILTRATE, MONONUCLEAR MULTIFOCAL	1
THYROID GLANDS	MICRO: FOLLICULAR EPITHELIAL HEIGHT BILATERAL	4
	COLLOID AREA BILATERAL	1
	CYST, ULTIMOBRANCHIAL MULTIFOCAL, BILATERAL	1
	MITOTIC FIGURES MULTIFOCAL, BILATERAL	2
TESTES	MICRO: RETENTION, SPERMATIDS MULTIFOCAL, BILATERAL	1

NO SIGNIFICANT CHANGES OBSERVED

GROSS:

ADRENAL GLANDS	BRAIN	EPIDIDYMIDES	ESOPHAGUS
EYES	HEART	INTESTINE	KIDNEYS
LIVER	LYMPH NODE, MES	LUNGS	MAMMARY GLAND
TESTIS, LT	TESTIS, RT	PANCREAS	PITUITARY
PROSTATE	SPINAL CORD	SAL. GLAND MAND	SKIN
SPLEEN	STOMACH	SEMINAL VESICLES	THYMUS
THYROID GLANDS	TRACHEA	URINARY BLADDER	COAGULATING GL

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL, 2-MILD, 3-MODERATE, 4-SEVERE, P-PRESENT

ANIMAL NO. 97160 GROUP 7: 100 MG PHENO MALE SCHEDULED EUTH 11/08/05 DATE OF DEATH: 11/08/05

ORGAN WEIGHT	ABS.(G)	REL.
LIVER	20.8467	5.839
SEM VES/CG/FLUID	2.0015	0.561
PROSTATE	0.9512	0.266
EPIDIDYMIDES	1.0019	0.281
TESTIS, RT	1.5751	0.441
TESTIS, LT	1.5839	0.444
THYROID GLANDS	0.0277	0.008
FINAL BODY WT(G)	357.	

		GRADE
EPIDIDYMIDES	MICRO: INFILTRATE, MONONUCLEAR	
	MULTIFOCAL	1
THYROID GLANDS	MICRO: FOLLICULAR EPITHELIAL HEIGHT	
	BILATERAL	3
	COLLOID AREA	
	BILATERAL	1
	CYST, ULTIMOBRANCHIAL	
	MULTIFOCAL, BILATERAL	1
	MITOTIC FIGURES	
	MULTIFOCAL, BILATERAL	1

NO SIGNIFICANT CHANGES OBSERVED

GROSS: ADRENAL GLANDS, BRAIN, EPIDIDYMIDES, ESOPHAGUS, EYES, HEART, INTESTINE, KIDNEYS, LIVER, LYMPH NODE, MES, LUNGS, MAMMARY GLAND, TESTIS, LT, TESTIS, RT, PANCREAS, PITUITARY, PROSTATE, SPINAL CORD, SAL. GLAND MAND, SKIN, SPLEEN, STOMACH, SEMINAL VESICLES, THYMUS, THYROID GLANDS, TRACHEA, URINARY BLADDER, COAGULATING GL

MICRO: TESTES

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL, 2-MILD, 3-MODERATE, 4-SEVERE, P-PRESENT

ANIMAL NO. 97177 GROUP 7: 100 MG PHENO MALE SCHEDULED EUTH 11/08/05 DATE OF DEATH: 11/08/05

ORGAN WEIGHT	ABS.(G)	REL.
LIVER	20.8395	5.413
SEM VES/CG/FLUID	1.3281	0.345
PROSTATE	0.7691	0.200
EPIDIDYMIDES	0.9778	0.254
TESTIS, RT	1.6487	0.428
TESTIS, LT	1.7246	0.448
THYROID GLANDS	0.0282	0.007
FINAL BODY WT(G)	385.	

GENERAL COMMENT

EPIDIDYMIDES

THYROID GLANDS

NO SIGNIFICANT CHANGES OBSERVED

				GRADE
GROSS:	ORGAN DAMAGED AT NECROPSY			P
	SEMINAL FLUID LOST PRIOR TO WEIGHING			
MICRO:	INFILTRATE, MONONUCLEAR			1
	MULTIFOCAL			
MICRO:	FOLLICULAR EPITHELIAL HEIGHT			4
	BILATERAL			
	COLLOID AREA			1
	BILATERAL			
	MITOTIC FIGURES			1
	MULTIFOCAL, BILATERAL			

GROSS: ADRENAL GLANDS, BRAIN, EPIDIDYMIDES, ESOPHAGUS, EYES, HEART, INTESTINE, KIDNEYS, LIVER, LYMPH NODE, MES, LUNGS, MAMMARY GLAND, TESTIS, LT, TESTIS, RT, PANCREAS, PITUITARY, PROSTATE, SPINAL CORD, SAL. GLAND MAND, SKIN, SPLEEN, STOMACH, SEMINAL VESICLES, THYMUS, THYROID GLANDS, TRACHEA, URINARY BLADDER, COAGULATING GL

MICRO: TESTES

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL, 2-MILD, 3-MODERATE, 4-SEVERE, P-PRESENT

ANIMAL NO. 97182 GROUP 7: 100 MG PHENO MALE SCHEDULED EUTH 11/08/05 DATE OF DEATH: 11/08/05

ORGAN WEIGHT	ABS.(G)	REL.
LIVER	19.1125	5.508
SEM VES/CG/FLUID	1.4588	0.420
PROSTATE	0.8606	0.248
EPIDIDYMIDES	0.9330	0.269
TESTIS, RT	1.5701	0.452
TESTIS, LT	1.5344	0.442
THYROID GLANDS	0.0273	0.008
FINAL BODY WT(G)	347.	

GENERAL COMMENT

EPIDIDYMIDES

THYROID GLANDS

NO SIGNIFICANT CHANGES OBSERVED

		GRADE
GROSS:	ORGAN DAMAGED AT NECROPSY	P
	SEMINAL FLUID LOST PRIOR TO WEIGHING	
MICRO:	INFILTRATE, MONONUCLEAR	1
	MULTIFOCAL	
MICRO:	FOLLICULAR EPITHELIAL HEIGHT	3
	BILATERAL	
	COLLOID AREA	1
	BILATERAL	
	CYST, ULTIMOBRANCHIAL	1
	MULTIFOCAL, BILATERAL	
	MITOTIC FIGURES	2
	MULTIFOCAL, BILATERAL	

GROSS: ADRENAL GLANDS, BRAIN, EPIDIDYMIDES, ESOPHAGUS, EYES, HEART, INTESTINE, KIDNEYS, LIVER, LYMPH NODE, MES, LUNGS, MAMMARY GLAND, TESTIS, LT, TESTIS, RT, PANCREAS, PITUITARY, PROSTATE, SPINAL CORD, SAL. GLAND MAND, SKIN, SPLEEN, STOMACH, SEMINAL VESICLES, THYMUS, THYROID GLANDS, TRACHEA, URINARY BLADDER, COAGULATING GL

MICRO: TESTES

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL, 2-MILD, 3-MODERATE, 4-SEVERE, P-PRESENT

ANIMAL NO. 97187 GROUP 7: 100 MG PHENO MALE SCHEDULED EUTH 11/08/05 DATE OF DEATH: 11/08/05

ORGAN WEIGHT	ABS.(G)	REL.
LIVER	25.6678	6.185
SEM VES/CG/FLUID	2.1658	0.522
PROSTATE	0.9217	0.222
EPIDIDYMIDES	1.0200	0.246
TESTIS, RT	1.7054	0.411
TESTIS, LT	1.7266	0.416
THYROID GLANDS	0.0274	0.007
FINAL BODY WT(G)	415.	

EPIDIDYMIDES
NO SIGNIFICANT CHANGES OBSERVED

THYROID GLANDS

		GRADE
MICRO:	INFILTRATE, MONONUCLEAR	
	MULTIFOCAL	1
MICRO:	FOLLICULAR EPITHELIAL HEIGHT	
	BILATERAL	3
	COLLOID AREA	
	BILATERAL	2
	MITOTIC FIGURES	
	MULTIFOCAL, BILATERAL	2

GROSS: ADRENAL GLANDS, BRAIN, EPIDIDYMIDES, ESOPHAGUS, EYES, HEART, INTESTINE, KIDNEYS, LIVER, LYMPH NODE, MES, LUNGS, MAMMARY GLAND, TESTIS, LT, TESTIS, RT, PANCREAS, PITUITARY, PROSTATE, SPINAL CORD, SAL. GLAND MAND, SKIN, SPLEEN, STOMACH, SEMINAL VESICLES, THYMUS, THYROID GLANDS, TRACHEA, URINARY BLADDER, COAGULATING GL

MICRO: TESTES

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL, 2-MILD, 3-MODERATE, 4-SEVERE, P-PRESENT

ANIMAL NO. 97191 GROUP 7: 100 MG PHENO MALE SCHEDULED EUTH 11/09/05 DATE OF DEATH: 11/09/05

ORGAN WEIGHT	ABS.(G)	REL.
LIVER	20.3943	5.453
SEM VES/CG/FLUID	1.6399	0.438
PROSTATE	0.8369	0.224
EPIDIDYMIDES	0.9498	0.254
TESTIS, RT	1.4667	0.392
TESTIS, LT	1.4666	0.392
THYROID GLANDS	0.0284	0.008
FINAL BODY WT(G)	374.	

		GRADE
EPIDIDYMIDES	MICRO: INFILTRATE, MONONUCLEAR MULTIFOCAL	1
THYROID GLANDS	MICRO: FOLLICULAR EPITHELIAL HEIGHT BILATERAL	3
	COLLOID AREA BILATERAL	2
	CYST, ULTIMOBRANCHIAL FOCAL, UNILATERAL	1
	MITOTIC FIGURES MULTIFOCAL, BILATERAL	2

NO SIGNIFICANT CHANGES OBSERVED

GROSS: ADRENAL GLANDS, BRAIN, EPIDIDYMIDES, ESOPHAGUS, EYES, HEART, INTESTINE, KIDNEYS, LIVER, LYMPH NODE, MES, LUNGS, MAMMARY GLAND, TESTIS, LT, TESTIS, RT, PANCREAS, PITUITARY, PROSTATE, SPINAL CORD, SAL. GLAND MAND, SKIN, SPLEEN, STOMACH, SEMINAL VESICLES, THYMUS, THYROID GLANDS, TRACHEA, URINARY BLADDER, COAGULATING GL

MICRO: TESTES

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL, 2-MILD, 3-MODERATE, 4-SEVERE, P-PRESENT

ANIMAL NO. 97194 GROUP 7: 100 MG PHENO MALE SCHEDULED EUTH 11/09/05 DATE OF DEATH: 11/09/05

ORGAN WEIGHT	ABS.(G)	REL.
LIVER	19.2728	5.266
SEM VES/CG/FLUID	1.7398	0.475
PROSTATE	0.6605	0.180
EPIDIDYMIDES	1.1902	0.325
TESTIS, RT	1.6754	0.458
TESTIS, LT	1.6245	0.444
THYROID GLANDS	0.0284	0.008
FINAL BODY WT(G)	366.	

		GRADE
EPIDIDYMIDES	MICRO: INFILTRATE, MONONUCLEAR MULTIFOCAL	1
THYROID GLANDS	MICRO: FOLLICULAR EPITHELIAL HEIGHT BILATERAL	3
	COLLOID AREA BILATERAL	1
	CYST, ULTIMOBRANCHIAL FOCAL, BILATERAL	1
	MITOTIC FIGURES MULTIFOCAL, BILATERAL	2

NO SIGNIFICANT CHANGES OBSERVED

GROSS: ADRENAL GLANDS, BRAIN, EPIDIDYMIDES, ESOPHAGUS, EYES, HEART, INTESTINE, KIDNEYS, LIVER, LYMPH NODE, MES, LUNGS, MAMMARY GLAND, TESTIS, LT, TESTIS, RT, PANCREAS, PITUITARY, PROSTATE, SPINAL CORD, SAL. GLAND MAND, SKIN, SPLEEN, STOMACH, SEMINAL VESICLES, THYMUS, THYROID GLANDS, TRACHEA, URINARY BLADDER, COAGULATING GL

MICRO: TESTES

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL, 2-MILD, 3-MODERATE, 4-SEVERE, P-PRESENT

ANIMAL NO. 97209 GROUP 7: 100 MG PHENO MALE SCHEDULED EUTH 11/09/05 DATE OF DEATH: 11/09/05

ORGAN WEIGHT	ABS.(G)	REL.
LIVER	17.7329	5.009
SEM VES/CG/FLUID	1.7047	0.482
PROSTATE	0.8619	0.243
EPIDIDYMIDES	1.1835	0.334
TESTIS, RT	1.6022	0.453
TESTIS, LT	1.6082	0.454
THYROID GLANDS	0.0270	0.008
FINAL BODY WT(G)	354.	

		GRADE
EPIDIDYMIDES	MICRO: INFILTRATE, MONONUCLEAR	
	MULTIFOCAL	1
THYROID GLANDS	MICRO: FOLLICULAR EPITHELIAL HEIGHT	
	BILATERAL	3
	COLLOID AREA	
	BILATERAL	3
	MITOTIC FIGURES	
	MULTIFOCAL, BILATERAL	1
TESTES	MICRO: RETENTION, SPERMATIDS	
	MULTIFOCAL, BILATERAL	1

NO SIGNIFICANT CHANGES OBSERVED

GROSS:

ADRENAL GLANDS	BRAIN	EPIDIDYMIDES	ESOPHAGUS
EYES	HEART	INTESTINE	KIDNEYS
LIVER	LYMPH NODE, MES	LUNGS	MAMMARY GLAND
TESTIS, LT	TESTIS, RT	PANCREAS	PITUITARY
PROSTATE	SPINAL CORD	SAL. GLAND MAND	SKIN
SPLEEN	STOMACH	SEMINAL VESICLES	THYMUS
THYROID GLANDS	TRACHEA	URINARY BLADDER	COAGULATING GL

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL, 2-MILD, 3-MODERATE, 4-SEVERE, P-PRESENT

ANIMAL NO. 97216 GROUP 7: 100 MG PHENO MALE SCHEDULED EUTH 11/09/05 DATE OF DEATH: 11/09/05

ORGAN WEIGHT	ABS.(G)	REL.
LIVER	22.9560	5.654
SEM VES/CG/FLUID	1.7879	0.440
PROSTATE	0.7676	0.189
EPIDIDYMIDES	0.9910	0.244
TESTIS, RT	1.6589	0.409
TESTIS, LT	1.6063	0.396
THYROID GLANDS	0.0301	0.007
FINAL BODY WT(G)	406.	

		GRADE
EPIDIDYMIDES	MICRO: INFILTRATE, MONONUCLEAR MULTIFOCAL	1
THYROID GLANDS	MICRO: FOLLICULAR EPITHELIAL HEIGHT BILATERAL	2
	COLLOID AREA BILATERAL	3
	CYST, ULTIMOBRANCHIAL FOCAL, UNILATERAL	1
	MITOTIC FIGURES MULTIFOCAL, BILATERAL	1

NO SIGNIFICANT CHANGES OBSERVED

GROSS: ADRENAL GLANDS, BRAIN, EPIDIDYMIDES, ESOPHAGUS, EYES, HEART, INTESTINE, KIDNEYS, LIVER, LYMPH NODE, MES, LUNGS, MAMMARY GLAND, TESTIS, LT, TESTIS, RT, PANCREAS, PITUITARY, PROSTATE, SPINAL CORD, SAL. GLAND MAND, SKIN, SPLEEN, STOMACH, SEMINAL VESICLES, THYMUS, THYROID GLANDS, TRACHEA, URINARY BLADDER, COAGULATING GL

MICRO: TESTES

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL, 2-MILD, 3-MODERATE, 4-SEVERE, P-PRESENT

ANIMAL NO. 97224 GROUP 7: 100 MG PHENO MALE SCHEDULED EUTH 11/09/05 DATE OF DEATH: 11/09/05

ORGAN WEIGHT	ABS.(G)	REL.
LIVER	22.4582	5.478
SEM VES/CG/FLUID	2.1769	0.531
PROSTATE	0.9623	0.235
EPIDIDYMIDES	1.0522	0.257
TESTIS, RT	1.6853	0.411
TESTIS, LT	1.6910	0.412
THYROID GLANDS	0.0280	0.007
FINAL BODY WT(G)	410.	

		GRADE
EPIDIDYMIDES	MICRO: INFILTRATE, MONONUCLEAR MULTIFOCAL	1
THYROID GLANDS	MICRO: FOLLICULAR EPITHELIAL HEIGHT BILATERAL	2
	COLLOID AREA BILATERAL	4
	CYST, ULTIMOBRANCHIAL MULTIFOCAL, UNILATERAL	1
	MITOTIC FIGURES MULTIFOCAL, BILATERAL	1
TESTES	MICRO: DEGENERATION, SEMINIFEROUS TUBULES FOCAL, BILATERAL	1

NO SIGNIFICANT CHANGES OBSERVED

GROSS:

ADRENAL GLANDS	BRAIN	EPIDIDYMIDES	ESOPHAGUS
EYES	HEART	INTESTINE	KIDNEYS
LIVER	LYMPH NODE, MES	LUNGS	MAMMARY GLAND
TESTIS, LT	TESTIS, RT	PANCREAS	PITUITARY
PROSTATE	SPINAL CORD	SAL. GLAND MAND	SKIN
SPLEEN	STOMACH	SEMINAL VESICLES	THYMUS
THYROID GLANDS	TRACHEA	URINARY BLADDER	COAGULATING GL

GROSS GRADE CODE: 1-SLIGHT, 2-MODERATE, 3-MARKED, P-PRESENT

MICRO GRADE CODE: 1-MINIMAL, 2-MILD, 3-MODERATE, 4-SEVERE, P-PRESENT

SPONSOR:BATTELLE INDIVIDUAL ORGAN WEIGHTS AND FINAL BODY WEIGHTS [G]
SPONSOR NO.:68-W-01-023

MALE GROUP:METHYLCELLULOSE

ANIMAL	FBW(G)	LIVER	SEM VES/ CG/FLUID	PROS TATE	EPIDID YMIDES	TESTI S, RT	TESTI S, LT	THYROID GLANDS
97126	361.	13.2813	1.5395	0.5541	0.8847	1.6472	1.6235	0.0170
97136	384.	14.1060	1.7555	1.1524	0.9990	1.7042	1.6746	0.0188
97157	393.	15.2207	1.8444	0.7049	1.0981	1.7088	1.6676	0.0199
97159	410.	14.9742	1.6902	0.9355	1.1125	1.6019	1.6658	0.0183
97168	328.	11.2768	1.4951	0.6811	0.9385	1.4931	1.5173	0.0221
97172	380.	13.3372	2.0130	0.5738	1.1155	1.5096	1.5359	0.0192
97192	415.	16.1395	1.5621	0.5845	0.9083	1.6234	1.5908	0.0198
97198	382.	14.2392	1.8379	0.7401	0.9936	1.7415	1.7759	0.0196
97200	391.	14.5793	1.2438	0.5745	0.9756	1.5756	1.5105	0.0210
97205	380.	13.0971	1.4337	0.7684	0.8932	1.6841	1.6893	0.0174
97212	433.	15.1968	1.4485	0.7297	1.1528	1.7606	1.7351	0.0266
97213	392.	16.2617	1.6266	0.7976	0.8482	1.7551	1.7140	0.0224
97226	397.	14.0987	1.4634	0.9720	0.9726	1.8151	1.8523	0.0207
97227	398.	15.2440	1.9755	0.8992	1.0746	1.7403	1.6867	0.0177
97237	381.	12.7062	1.7956	0.8928	1.1388	1.6524	1.6303	0.0227
MEAN	388.	14.2506	1.6483	0.7707	1.0071	1.6675	1.6580	0.0202
S.D.	23.9	1.34813	0.21981	0.17307	0.10155	0.09370	0.09483	0.00251
N	15	15	15	15	15	15	15	15

FBW = FINAL BODY WEIGHT

MALE GROUP: 50 MG LINURON

ANIMAL	FBW(G)	LIVER	SEM VES/ CG/FLUID	PROS TATE	EPIDID YMIDES	TESTI S, RT	TESTI S, LT	THYROID GLANDS
97122	359.	14.4254	1.1039	0.3743	0.9705	1.9213	1.8794	0.0172
97124	327.	14.0969	1.8284	0.6382	1.0376	1.5671	1.5761	0.0180
97125	328.	10.5358	1.5549	0.7243	0.9352	1.5587	1.5639	0.0165
97137	337.	13.3232	1.5560	0.6678	1.0113	1.8230	1.7513	0.0182
97138	343.	13.3391	1.5532	0.5843	0.9504	1.6240	1.6600	0.0145
97165	347.	12.5968	1.5686	0.8924	1.0679	1.7710	1.8005	0.0194
97176	321.	12.4638	0.9652	0.7123	0.9717	1.6430	1.5984	0.0222
97189	366.	14.6307	1.4216	0.7805	0.9808	1.4604	1.4948	0.0252
97197	318.	13.0421	1.2420	0.5909	0.8986	1.7430	1.6722	0.0204
97199	385.	16.7145	1.6940	0.5568	0.9825	2.0049	2.0423	0.0214
97206	370.	15.7944	1.1097	0.4876	0.9211	1.7640	1.8376	0.0229
97210	348.	16.6592	1.4197	0.5593	0.9663	1.6764	1.6471	0.0215
97217	357.	13.4197	1.3626	0.6212	0.8999	1.6421	1.7311	0.0174
97221	381.	15.4026	1.1904	0.5899	0.9324	1.5226	1.5093	0.0192
97236	349.	14.0118	0.8988	0.8107	0.9800	1.5821	1.5702	0.0276
MEAN	349.	14.0304	1.3646	0.6394	0.9671	1.6869	1.6889	0.0201
S.D.	20.8	1.66219	0.27186	0.13129	0.04746	0.15091	0.15233	0.00346
N	15	15	15	15	15	15	15	15

FBW = FINAL BODY WEIGHT

MALE GROUP: 100 MG LINURON

ANIMAL	FBW(G)	LIVER	SEM VES/ CG/FLUID	PROS TATE	EPIDID YMIDES	TESTI S, RT	TESTI S, LT	THYROID GLANDS
97119	297.	11.7150	1.4139	0.4659	0.8762	1.5647	1.6727	0.0151
97132	284.	11.3047	1.2040	0.5272	0.8932	1.6500	1.5640	0.0147
97148	306.	11.0698	0.8911	0.4271	1.0170	1.6781	1.6729	0.0169
97150	349.	14.1006	1.2457	0.5057	0.9211	1.6690	1.6560	0.0254
97152	301.	12.7551	1.3833	0.6198	0.9237	1.5573	1.5386	0.0208
97163	278.	10.9094	0.5669	0.4124	0.8652	1.7019	1.6943	0.0179
97166	337.	15.3363	1.1779	0.5367	1.0070	1.6887	1.6722	0.0190
97167	358.	14.8078	1.5567	0.7388	0.8068	1.6032	1.6389	0.0218
97170	346.	14.2135	1.2553	0.5347	0.9469	1.6177	1.5414	0.0272
97181	307.	13.1454	1.2186	0.6207	0.8560	1.6445	1.6256	0.0244
97184	332.	12.6246	1.3220	0.8039	0.9211	1.4997	1.4584	0.0206
97185	335.	15.7151	1.1053	0.5143	0.9437	1.5667	1.5564	0.0171
97188	338.	13.6014	1.4094	0.4816	0.9040	1.4108	1.3436	0.0231
97193	322.	12.5873	0.6140	0.3096	0.7161	1.3514	1.3047	0.0175
97238	337.	15.0871	1.3712	0.6133	0.9462	1.6276	1.6229	0.0172
MEAN	322.	13.2649	1.1824	0.5408	0.9029	1.5888	1.5708	0.0199
S.D.	24.6	1.59152	0.28593	0.12549	0.07511	0.10164	0.11987	0.00381
N	15	15	15	15	15	15	15	15

FBW = FINAL BODY WEIGHT

MALE GROUP: 150 MG LINURON

ANIMAL	FBW(G)	LIVER	SEM VES/ CG/FLUID	PROS TATE	EPIDID YMIDES	TESTI S, RT	TESTI S, LT	THYROID GLANDS
97128	299.	11.7742	0.8045	0.3882	0.7920	1.5189	1.4933	0.0188
97140	311.	13.2695	0.9529	0.5545	0.9399	1.5915	1.5502	0.0181
97142	323.	12.0973	1.7480	0.6654	0.8677	1.6047	1.5075	0.0229
97144	312.	11.6323	1.5750	0.6053	1.0014	1.6147	1.6729	0.0201
97161	299.	11.7644	1.4687	0.6880	1.0897	1.7881	1.7305	0.0151
97162	300.	12.2299	1.0868	0.5386	0.8988	1.6797	1.7205	0.0207
97171	312.	12.4179	1.0056	0.6952	0.8354	1.7160	1.6548	0.0176
97174	307.	12.1522	1.1622	0.5595	0.9956	1.7063	1.6019	0.0223
97207	324.	14.8017	1.5990	0.5212	1.0178	1.6962	1.6778	0.0182
97211	298.	13.2364	1.3373	0.7154	0.9143	1.5759	1.5603	0.0165
97214	290.	14.1564	0.9735	0.4458	0.9240	1.4606	1.4758	0.0185
97222	309.	11.9787	1.3927	0.6461	0.9366	1.6854	1.6106	0.0212
97225	339.	14.3576	1.6141	0.7308	1.0282	1.5780	1.5781	0.0232
97231	303.	11.9280	0.9318	0.4819	1.0205	1.6949	1.6336	0.0201
MEAN	309.	12.6998	1.2609	0.5883	0.9473	1.6365	1.6048	0.0195
S.D.	12.8	1.06881	0.30893	0.10670	0.08299	0.08805	0.08168	0.00241
N	14	14	14	14	14	14	14	14

FBW = FINAL BODY WEIGHT

MALE GROUP: 25 MG PHENO

ANIMAL	FBW(G)	LIVER	SEM VES/ CG/FLUID	PROS TATE	EPIDID YMIDES	TESTI S, RT	TESTI S, LT	THYROID GLANDS
97121	374.	17.8690	1.3466	0.6827	1.0444	1.6406	1.6055	0.0282
97127	445.	22.3932	1.3025	0.7724	0.8985	1.6429	1.6119	0.0234
97131	377.	16.3301	1.3025	0.9038	0.9547	1.5006	1.5863	0.0259
97133	420.	17.6786	1.5156	0.7958	0.9804	1.6345	1.6198	0.0237
97134	392.	17.7439	1.2636	0.4821	0.9348	1.7146	1.6885	0.0281
97141	379.	15.2624	1.8198	0.6676	0.9628	1.6213	1.6286	0.0251
97143	364.	15.6572	1.5412	0.7911	0.9616	1.6166	1.6445	0.0213
97151	400.	17.9768	1.8862	1.0443	1.1733	1.6767	1.6836	0.0248
97155	330.	15.0180	1.7192	0.8108	0.9593	1.5305	1.5449	0.0305
97173	421.	19.7581	1.9053	1.1363	1.1648	1.7707	1.8441	0.0234
97180	391.	17.8297	1.9885	0.8669	0.9220	1.6877	1.6666	0.0294
97186	354.	15.3606	1.4716	0.7637	1.1133	1.6341	1.5602	0.0287
97218	409.	17.8800	1.6230	0.8935	1.0729	1.8469	1.9068	0.0307
97233	398.	16.9987	1.5238	0.8658	0.9760	1.6840	1.6306	0.0241
97235	356.	16.4516	1.3539	0.5688	0.9051	1.4680	1.4521	0.0260
MEAN	387.	17.3472	1.5709	0.8030	1.0016	1.6446	1.6449	0.0262
S.D.	30.0	1.91348	0.24264	0.16670	0.09041	0.09735	0.11138	0.00288
N	15	15	15	15	15	15	15	15

FBW = FINAL BODY WEIGHT

MALE GROUP: 50 MG PHENO

ANIMAL	FBW(G)	LIVER	SEM VES/ CG/FLUID	PROS TATE	EPIDID YMIDES	TESTI S, RT	TESTI S, LT	THYROID GLANDS
97123	374.	16.8052	1.8104	0.9909	0.9501	1.5904	1.6323	0.0199
97129	376.	18.2043	1.8007	0.7686	1.1038	1.5638	1.5631	0.0240
97135	386.	18.3293	1.6272	0.9622	1.0165	1.7999	1.7126	0.0236
97139	376.	17.6991	1.3847	0.8907	0.8576	1.3810	1.4173	0.0279
97146	400.	18.2170	1.4654	0.8992	1.1001	1.6966	1.6572	0.0269
97149	391.	17.9682	1.4591	0.6521	0.9995	1.5061	1.5482	0.0300
97183	373.	17.4959	1.5344	0.7537	0.9643	1.5445	1.5495	0.0214
97190	424.	20.7030	2.0360	0.8305	1.0981	1.8179	1.8185	0.0267
97195	356.	15.6544	1.5881	0.9022	1.0990	1.6624	1.6597	0.0259
97203	403.	20.0905	1.8461	0.7712	1.0033	1.9341	1.9108	0.0294
97215	403.	21.2073	1.8263	1.0520	1.1426	1.6825	1.6344	0.0317
97228	357.	17.9913	1.8667	0.9149	1.0411	1.4467	1.4599	0.0328
97229	349.	16.4548	1.8560	1.0214	1.1370	1.7017	1.6177	0.0227
97230	365.	17.4829	1.6126	0.7836	1.0063	1.6139	1.5487	0.0258
97232	377.	18.9355	1.5799	0.8085	0.8323	2.0561	0.3152	0.0285
MEAN	381.	18.2159	1.6862	0.8668	1.0234	1.6665	1.5363	0.0265
S.D.	20.6	1.51814	0.18928	0.11250	0.09459	0.18049	0.36041	0.00371
N	15	15	15	15	15	15	15	15

FBW = FINAL BODY WEIGHT

MALE GROUP: 100 MG PHENO

ANIMAL	FBW(G)	LIVER	SEM VES/ CG/FLUID	PROS TATE	EPIDID YMIDES	TESTI S, RT	TESTI S, LT	THYROID GLANDS
97120	350.	18.0452	1.4848	0.5521	0.9889	1.3480	1.3873	0.0221
97130	365.	20.7555	1.8905	0.9084	1.0222	1.6187	1.6894	0.0287
97145	330.	14.6807	1.8173	0.5946	0.8538	1.4209	1.4690	0.0191
97154	361.	17.1305	1.6258	0.8845	1.1033	1.7761	1.7516	0.0237
97158	349.	17.5723	1.5223	0.7934	1.1141	1.6691	1.6285	0.0196
97160	357.	20.8467	2.0015	0.9512	1.0019	1.5751	1.5839	0.0277
97177	385.	20.8395	1.3281	0.7691	0.9778	1.6487	1.7246	0.0282
97182	347.	19.1125	1.4588	0.8606	0.9330	1.5701	1.5344	0.0273
97187	415.	25.6678	2.1658	0.9217	1.0200	1.7054	1.7266	0.0274
97191	374.	20.3943	1.6399	0.8369	0.9498	1.4667	1.4666	0.0284
97194	366.	19.2728	1.7398	0.6605	1.1902	1.6754	1.6245	0.0284
97209	354.	17.7329	1.7047	0.8619	1.1835	1.6022	1.6082	0.0270
97216	406.	22.9560	1.7879	0.7676	0.9910	1.6589	1.6063	0.0301
97224	410.	22.4582	2.1769	0.9623	1.0522	1.6853	1.6910	0.0280
MEAN	369.	19.8189	1.7389	0.8089	1.0273	1.6015	1.6066	0.0261
S.D.	25.8	2.79138	0.25676	0.12884	0.09439	0.11796	0.10971	0.00352
N	14	14	14	14	14	14	14	14

FBW = FINAL BODY WEIGHT

MALE GROUP:METHYLCELLULOSE

ANIMAL	FBW(G)	LIVER	SEM VES/ CG/FLUID	PROS TATE	EPIDID YMIDES	TESTI S, RT	TESTI S, LT	THYROID GLANDS
97126	361.	3.679	0.426	0.153	0.245	0.456	0.450	0.005
97136	384.	3.673	0.457	0.300	0.260	0.444	0.436	0.005
97157	393.	3.873	0.469	0.179	0.279	0.435	0.424	0.005
97159	410.	3.652	0.412	0.228	0.271	0.391	0.406	0.004
97168	328.	3.438	0.456	0.208	0.286	0.455	0.463	0.007
97172	380.	3.510	0.530	0.151	0.294	0.397	0.404	0.005
97192	415.	3.889	0.376	0.141	0.219	0.391	0.383	0.005
97198	382.	3.728	0.481	0.194	0.260	0.456	0.465	0.005
97200	391.	3.729	0.318	0.147	0.250	0.403	0.386	0.005
97205	380.	3.447	0.377	0.202	0.235	0.443	0.445	0.005
97212	433.	3.510	0.335	0.169	0.266	0.407	0.401	0.006
97213	392.	4.148	0.415	0.203	0.216	0.448	0.437	0.006
97226	397.	3.551	0.369	0.245	0.245	0.457	0.467	0.005
97227	398.	3.830	0.496	0.226	0.270	0.437	0.424	0.004
97237	381.	3.335	0.471	0.234	0.299	0.434	0.428	0.006
MEAN	388.	3.666	0.426	0.199	0.260	0.430	0.428	0.005
S.D.	23.9	0.2124	0.0615	0.0439	0.0250	0.0252	0.0276	0.0008
N	15	15	15	15	15	15	15	15

FBW = FINAL BODY WEIGHT

MALE GROUP: 50 MG LINURON

ANIMAL	FBW(G)	LIVER	SEM VES/ CG/FLUID	PROS TATE	EPIDID YMIDES	TESTI S, RT	TESTI S, LT	THYROID GLANDS
97122	359.	4.018	0.307	0.104	0.270	0.535	0.524	0.005
97124	327.	4.311	0.559	0.195	0.317	0.479	0.482	0.006
97125	328.	3.212	0.474	0.221	0.285	0.475	0.477	0.005
97137	337.	3.953	0.462	0.198	0.300	0.541	0.520	0.005
97138	343.	3.889	0.453	0.170	0.277	0.473	0.484	0.004
97165	347.	3.630	0.452	0.257	0.308	0.510	0.519	0.006
97176	321.	3.883	0.301	0.222	0.303	0.512	0.498	0.007
97189	366.	3.997	0.388	0.213	0.268	0.399	0.408	0.007
97197	318.	4.101	0.391	0.186	0.283	0.548	0.526	0.006
97199	385.	4.341	0.440	0.145	0.255	0.521	0.530	0.006
97206	370.	4.269	0.300	0.132	0.249	0.477	0.497	0.006
97210	348.	4.787	0.408	0.161	0.278	0.482	0.473	0.006
97217	357.	3.759	0.382	0.174	0.252	0.460	0.485	0.005
97221	381.	4.043	0.312	0.155	0.245	0.400	0.396	0.005
97236	349.	4.015	0.258	0.232	0.281	0.453	0.450	0.008
MEAN	349.	4.014	0.392	0.184	0.278	0.484	0.485	0.006
S.D.	20.8	0.3544	0.0836	0.0413	0.0222	0.0454	0.0407	0.0010
N	15	15	15	15	15	15	15	15

FBW = FINAL BODY WEIGHT

MALE GROUP: 100 MG LINURON

ANIMAL	FBW(G)	LIVER	SEM VES/ CG/FLUID	PROS TATE	EPIDID YMIDES	TESTI S, RT	TESTI S, LT	THYROID GLANDS
97119	297.	3.944	0.476	0.157	0.295	0.527	0.563	0.005
97132	284.	3.981	0.424	0.186	0.315	0.581	0.551	0.005
97148	306.	3.618	0.291	0.140	0.332	0.548	0.547	0.006
97150	349.	4.040	0.357	0.145	0.264	0.478	0.474	0.007
97152	301.	4.238	0.460	0.206	0.307	0.517	0.511	0.007
97163	278.	3.924	0.204	0.148	0.311	0.612	0.609	0.006
97166	337.	4.551	0.350	0.159	0.299	0.501	0.496	0.006
97167	358.	4.136	0.435	0.206	0.225	0.448	0.458	0.006
97170	346.	4.108	0.363	0.155	0.274	0.468	0.445	0.008
97181	307.	4.282	0.397	0.202	0.279	0.536	0.530	0.008
97184	332.	3.803	0.398	0.242	0.277	0.452	0.439	0.006
97185	335.	4.691	0.330	0.154	0.282	0.468	0.465	0.005
97188	338.	4.024	0.417	0.142	0.267	0.417	0.398	0.007
97193	322.	3.909	0.191	0.096	0.222	0.420	0.405	0.005
97238	337.	4.477	0.407	0.182	0.281	0.483	0.482	0.005
MEAN	322.	4.115	0.367	0.168	0.282	0.497	0.492	0.006
S.D.	24.6	0.2904	0.0843	0.0360	0.0305	0.0565	0.0602	0.0011
N	15	15	15	15	15	15	15	15

FBW = FINAL BODY WEIGHT

MALE GROUP: 150 MG LINURON

ANIMAL	FBW(G)	LIVER	SEM VES/ CG/FLUID	PROS TATE	EPIDID YMIDES	TESTI S, RT	TESTI S, LT	THYROID GLANDS
97128	299.	3.938	0.269	0.130	0.265	0.508	0.499	0.006
97140	311.	4.267	0.306	0.178	0.302	0.512	0.498	0.006
97142	323.	3.745	0.541	0.206	0.269	0.497	0.467	0.007
97144	312.	3.728	0.505	0.194	0.321	0.518	0.536	0.006
97161	299.	3.935	0.491	0.230	0.364	0.598	0.579	0.005
97162	300.	4.077	0.362	0.180	0.300	0.560	0.574	0.007
97171	312.	3.980	0.322	0.223	0.268	0.550	0.530	0.006
97174	307.	3.958	0.379	0.182	0.324	0.556	0.522	0.007
97207	324.	4.568	0.494	0.161	0.314	0.524	0.518	0.006
97211	298.	4.442	0.449	0.240	0.307	0.529	0.524	0.006
97214	290.	4.882	0.336	0.154	0.319	0.504	0.509	0.006
97222	309.	3.877	0.451	0.209	0.303	0.545	0.521	0.007
97225	339.	4.235	0.476	0.216	0.303	0.465	0.466	0.007
97231	303.	3.937	0.308	0.159	0.337	0.559	0.539	0.007
MEAN	309.	4.112	0.406	0.190	0.307	0.530	0.520	0.006
S.D.	12.8	0.3306	0.0898	0.0322	0.0273	0.0336	0.0327	0.0006
N	14	14	14	14	14	14	14	14

FBW = FINAL BODY WEIGHT

MALE GROUP: 25 MG PHENO

ANIMAL	FBW(G)	LIVER	SEM VES/ CG/FLUID	PROS TATE	EPIDID YMIDES	TESTI S, RT	TESTI S, LT	THYROID GLANDS
97121	374.	4.778	0.360	0.183	0.279	0.439	0.429	0.008
97127	445.	5.032	0.293	0.174	0.202	0.369	0.362	0.005
97131	377.	4.332	0.345	0.240	0.253	0.398	0.421	0.007
97133	420.	4.209	0.361	0.189	0.233	0.389	0.386	0.006
97134	392.	4.527	0.322	0.123	0.238	0.437	0.431	0.007
97141	379.	4.027	0.480	0.176	0.254	0.428	0.430	0.007
97143	364.	4.301	0.423	0.217	0.264	0.444	0.452	0.006
97151	400.	4.494	0.472	0.261	0.293	0.419	0.421	0.006
97155	330.	4.551	0.521	0.246	0.291	0.464	0.468	0.009
97173	421.	4.693	0.453	0.270	0.277	0.421	0.438	0.006
97180	391.	4.560	0.509	0.222	0.236	0.432	0.426	0.008
97186	354.	4.339	0.416	0.216	0.314	0.462	0.441	0.008
97218	409.	4.372	0.397	0.218	0.262	0.452	0.466	0.008
97233	398.	4.271	0.383	0.218	0.245	0.423	0.410	0.006
97235	356.	4.621	0.380	0.160	0.254	0.412	0.408	0.007
MEAN	387.	4.474	0.408	0.208	0.260	0.426	0.426	0.007
S.D.	30.0	0.2507	0.0682	0.0400	0.0282	0.0264	0.0278	0.0011
N	15	15	15	15	15	15	15	15

FBW = FINAL BODY WEIGHT

MALE GROUP: 50 MG PHENO

ANIMAL	FBW(G)	LIVER	SEM VES/ CG/FLUID	PROS TATE	EPIDID YMIDES	TESTI S, RT	TESTI S, LT	THYROID GLANDS
97123	374.	4.493	0.484	0.265	0.254	0.425	0.436	0.005
97129	376.	4.842	0.479	0.204	0.294	0.416	0.416	0.006
97135	386.	4.749	0.422	0.249	0.263	0.466	0.444	0.006
97139	376.	4.707	0.368	0.237	0.228	0.367	0.377	0.007
97146	400.	4.554	0.366	0.225	0.275	0.424	0.414	0.007
97149	391.	4.595	0.373	0.167	0.256	0.385	0.396	0.008
97183	373.	4.691	0.411	0.202	0.259	0.414	0.415	0.006
97190	424.	4.883	0.480	0.196	0.259	0.429	0.429	0.006
97195	356.	4.397	0.446	0.253	0.309	0.467	0.466	0.007
97203	403.	4.985	0.458	0.191	0.249	0.480	0.474	0.007
97215	403.	5.262	0.453	0.261	0.284	0.417	0.406	0.008
97228	357.	5.040	0.523	0.256	0.292	0.405	0.409	0.009
97229	349.	4.715	0.532	0.293	0.326	0.488	0.464	0.007
97230	365.	4.790	0.442	0.215	0.276	0.442	0.424	0.007
97232	377.	5.023	0.419	0.214	0.221	0.545	0.084	0.008
MEAN	381.	4.782	0.444	0.229	0.270	0.438	0.404	0.007
S.D.	20.6	0.2312	0.0517	0.0342	0.0284	0.0449	0.0924	0.0010
N	15	15	15	15	15	15	15	15

FBW = FINAL BODY WEIGHT

MALE GROUP: 100 MG PHENO

ANIMAL	FBW(G)	LIVER	SEM VES/ CG/FLUID	PROS TATE	EPIDID YMIDES	TESTI S, RT	TESTI S, LT	THYROID GLANDS
97120	350.	5.156	0.424	0.158	0.283	0.385	0.396	0.006
97130	365.	5.686	0.518	0.249	0.280	0.443	0.463	0.008
97145	330.	4.449	0.551	0.180	0.259	0.431	0.445	0.006
97154	361.	4.745	0.450	0.245	0.306	0.492	0.485	0.007
97158	349.	5.035	0.436	0.227	0.319	0.478	0.467	0.006
97160	357.	5.839	0.561	0.266	0.281	0.441	0.444	0.008
97177	385.	5.413	0.345	0.200	0.254	0.428	0.448	0.007
97182	347.	5.508	0.420	0.248	0.269	0.452	0.442	0.008
97187	415.	6.185	0.522	0.222	0.246	0.411	0.416	0.007
97191	374.	5.453	0.438	0.224	0.254	0.392	0.392	0.008
97194	366.	5.266	0.475	0.180	0.325	0.458	0.444	0.008
97209	354.	5.009	0.482	0.243	0.334	0.453	0.454	0.008
97216	406.	5.654	0.440	0.189	0.244	0.409	0.396	0.007
97224	410.	5.478	0.531	0.235	0.257	0.411	0.412	0.007
MEAN	369.	5.348	0.471	0.219	0.279	0.435	0.436	0.007
S.D.	25.8	0.4503	0.0604	0.0323	0.0304	0.0311	0.0290	0.0008
N	14	14	14	14	14	14	14	14

FBW = FINAL BODY WEIGHT

POFBWv4.14
12/29/2005
R:12/29/2005

APPENDIX J

Study Protocol, Amendments And QAPP

Study Number: WIL-431014

PROTOCOL AMENDMENT II

Sponsor: Battelle Memorial Institute

EPA Contract No.: 68-W-01-023

A. Title of Study:

Inter-laboratory[1] Validation of the 15-Day Adult Intact Male Rat Assay with Linuron and Phenobarbital (WA 5-15)

B. Protocol Modification:

9 HORMONE ASSAYS (BLINDED TO TREATMENT GROUP):

1) The footnote on the DHT RIA is changed to the following per Form A-186 dated 18-Nov-2005:

DHT levels will be measured along with the rest of the hormones.

[1] -The study described in this protocol/amendment describes that performed by a single laboratory, but will be used in support of an inter-laboratory validation of this bioassay.

C. Reason for Protocol Modification:

1) At the request of the EPA and Battelle (email dated 15-Nov-2005), DHT levels will be measured along with the rest of the hormones. This overrides the change to this section described in protocol amendment I.

Approved By:

Battelle Memorial Institute

David P Houchens, PhD
Program Manager
Endocrine Disruptor Screening Program

11/26/05
Date

Prepared By:

WIL Research Laboratories, LLC

Christopher J. Bowman, PhD, DABT
Study Director

23 NOV 2005
Date

Mark D. Nemec, BS, DABT
Director, Developmental and
Reproductive Toxicology

11/23/05
Date

Study Number: WIL-431014

PROTOCOL AMENDMENT I

Sponsor: Battelle Memorial Institute

EPA Contract No.: 68-W-01-023

A. Title of Study:

Inter-Laboratory[1] Validation of the 15-Day Adult Intact Male Rat Assay with Linuron and Phenobarbital (WA 5-15)

B. Protocol Modifications:

1) **7.5.1 Method and Frequency of Preparation:**

The third sentence is changed to the following:

Dosing formulations of each test and vehicle control substance will be prepared twice for use on-study, aliquoted into amber bottles with stir bar per group, sampled as described below and stored refrigerated.

2) **7.5.2 Homogeneity, Stability and Concentration of Test Substance Formulations:**

The third and fourth sentence of the first paragraph is changed to the following:

Samples from the top and bottom strata will also be collected from the last dosing aliquot from that first dose formulation preparation (on the day that it will be used for dosing) and analyzed for resuspension homogeneity and stability. For both samplings, extra samples will be collected for back-up (and stored refrigerated).

3) **7.6.1 Clinical Signs:**

The last sentence is changed to the following:

On Test Days 1 through 14, the rats will also be observed approximately 6 hours following dosing and the observations will be recorded.

[1] -The study described in this protocol/amendment describes that performed by a single laboratory, but will be used in support of an inter-laboratory validation of this bioassay.

4) **8.1** **Blood Collection and Macroscopic Examination:**

This first sentence of the third paragraph is changed to the following:

Immediately following euthanasia, trunk blood will be collected (as much as possible) into a red-top tube(s).

5) **9** **HORMONE ASSAYS (BLINDED TO TREATMENT GROUP):**

The footnote on the DHT RIA is changed to the following:

The trigger to conduct serum DHT concentration (via RIA) will be done on a group basis if there is a statistically significant mean decrease in one or more androgen-dependent organ weights (relative weight for accessory sex gland, seminal vesicles and prostate and absolute paired weights for the testes and epididymides) and no corresponding decrease in serum testosterone concentrations in the treated groups compared to the control group. If one or more of these conditions is seen, the Study Director will contact the Sponsor to discuss whether or not to evaluate DHT concentrations.

C. Reasons for Protocol Additions/Modifications:

1) Stability results provided by the Sponsor since the finalization of the protocol indicated that the phenobarbital preparation may not be stable beyond 14 days, therefore dose formulations will be made twice during the study rather than once.

2) The resuspension homogeneity and stability sampling of the dose formulations was rescheduled based on Sponsor-provided information that the phenobarbital preparations may not be stable beyond 14 days. At this time no sampling is planned on the second batch dose preparations.

3) The post-dose observation time was inadvertently listed incorrectly in the original protocol, it has been changed from 1-hr to 6-hr.

4) WIL has recently discontinued use of serum-separator tubes for blood collection to be used for serum hormone analysis, therefore plain red-top tubes will be used for blood collection.

5) The footnote triggering the DHT RIA assessment was changed at the request of the Sponsor (e-mail dated 13-Oct-2005).

Approved By:

Battelle Memorial Institute

David P. Houchens, PhD
Program Manager
Endocrine Disruptor Screening Program

10/24/05
Date

Prepared By:

WIL Research Laboratories, LLC

Christopher J. Bowman, PhD
Study Director

20-OCT-2005
Date

Mark D. Nemec, BS, DABT
Director, Developmental and
Reproductive Toxicology

20-oct-2005
Date

PROTOCOL

INTER-LABORATORY[1] VALIDATION OF THE 15-DAY ADULT INTACT MALE RAT ASSAY WITH LINURON AND PHENOBARBITAL (WA 5-15)

EPA Contract No. 68-W-01-023

Submitted To:

Battelle Memorial Institute
505 King Avenue
Columbus, OH 43201-2693

WIL Research Laboratories, LLC
1407 George Road
Ashland, OH 44805-9281

[1]- The study described in this protocol describes that performed by a single laboratory, but will be used in support of an inter-laboratory validation of this bioassay.

1 PURPOSE AND OBJECTIVE:

The overall purpose of this study is to provide data from a participating laboratory (WIL) to an interlaboratory validation effort to determine if similar results can be obtained among three different contract research laboratories using a similar protocol, test substances and dosage levels. A secondary purpose is to determine if the observed results from this interlaboratory validation are comparable to the expected results established in earlier studies using a similar protocol.

The specific purpose of this study is to evaluate the response of the adult male rat assay to two test substances that have known endocrine activity. This assay was originally developed and documented by DuPont (O'Connor, 2002).

The objective of this study is to evaluate the ability of this assay to detect endocrine active chemicals by measuring body and organ weight changes, histology and changes in circulating concentrations of hormones.

2 PERSONNEL INVOLVED IN THE STUDY:

2.1 Sponsor Representative:

David P. Houchens, PhD
Program Manager/Study Monitor
Endocrine Disruptor Screening Program
Battelle Memorial Institute
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2.2 U.S. EPA Representative:

Don R. Bergfelt, PhD
Work Assignment Manager
Endocrine Disruptor Screening Program
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2.3 WIL Study Director:

Christopher J. Bowman, PhD
Staff Toxicologist, Developmental
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2.4 WIL Deputy Director:

Donald G. Stump, PhD, DABT
Associate Director, Developmental
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2.5 Study Pathologist:

Karen S. Regan, DVM, DACVP, DABT
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2.6 Statistical Analysis (Section 11):

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2.7 WIL Staff Involved with Study:

Joseph F. Holson, PhD
President, Director

Mark D. Nemec, BS, DABT
Director, Developmental and
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Heather L. Osborn, BS, RQAP-GLP
Manager, Quality Assurance

Lisa T. Snyder, DVM
Clinical Veterinarian

Susan C. Haley, BS
Manager, Clinical Pathology

Michael Safron, AS, HT (ASCP)
Manager, Histology

Carol A. Kopp, BS, LAT
Manager, Gross Pathology and
Developmental Toxicology Laboratory

Deborah A. Shoup, BS, LAT
Group Manager, Developmental,
Reproductive and Neurotoxicology

3 STUDY SCHEDULE:

Proposed Animal Receipt Date:	October 18, 2005
Proposed Experimental Start/Starting Date:	October 24, 2005
Proposed First Days of Dose Administration:	October 24-26, 2005
Proposed Necropsy Dates:	November 7-9, 2005
Proposed Experimental/Completion Termination Date:	November 9, 2005
Proposed Audited Report Date:	December 30, 2005

4 TEST SUBSTANCE DATA:

Reserve samples of the test substances will be taken in accordance with WIL standard operating procedures and stored in the Archives at WIL Research Laboratories, LLC indefinitely, unless otherwise specified.

Personnel safety data are to be provided by the Sponsor. It is the responsibility of the Sponsor to notify the testing facility of any special handling requirements of the test material. A material safety data sheet (MSDS) will accompany the test material upon arrival at the laboratory.

Both neat test substances will be provided by the Sponsor as purchased from Sigma-Aldrich (Phenobarbital) and ChemServices (Linuron).

4.1 Phenobarbital:

4.1.1 Identification:

CAS No. 50-06-6

4.1.2 Lot Number:

104K2600

4.1.3 Purity:

99.1%

4.1.4 Stability:

The test substance is considered to be stable under the storage conditions provided by the Sponsor.

4.1.5 Physical Description:

To be documented by WIL Research Laboratories, LLC

4.1.6 Storage Conditions:

Room temperature

4.1.7 Target Dosages:

25, 50 and 100 mg/kg/day

4.1.8 Target Dose Concentrations:

5, 10 and 20 mg/mL

4.1.9 Type of Formulations:

Suspension in 0.25% methylcellulose.

4.2 <u>Linuron:</u>

4.2.1 Identification:

CAS No. 330-55-2

4.2.2 Lot Number:

348-8A

4.2.3 Purity:

99.5%

4.2.4 Stability:

The test substance is considered to be stable under the storage conditions provided by the Sponsor.

4.2.5 Physical Description:

To be documented by WIL Research Laboratories, LLC

4.2.6 Storage Conditions:

Room Temperature

4.2.7 Target Dosages:

50, 100 and 150 mg/kg/day

4.2.8 Target Dose Concentrations:

10, 20 and 30 mg/mL

4.2.9 Type of Formulations:

Suspensions in 0.25% methylcellulose.

5 TEST SYSTEM:

5.1 Species:

Rat

5.2 Strain:

Sprague-Dawley Crl:CD®(SD)

5.3 Source:

Charles River Laboratories
Raleigh, NC

5.4 Number on Study:

105 Males on study (maximum of 120 males ordered). Animals not assigned to the study will be transferred to the stock animal colony or will be euthanized by carbon dioxide inhalation and the carcasses discarded.

The number of animals used is the minimum number consistent with accomplishing the objectives of this study.

5.5 Body Weight Range:

Approximately 225 to 350 grams at randomization.

5.6 Age:

Approximately 10 weeks of age at the start of dose administration.

5.7 Identification System:

Animal will be uniquely identified by a Monel® metal ear tag displaying the animal number. Individual cage cards will be affixed to each cage and will display the animal number, group number, and study number of the animal.

5.8 Justification for Selection:

This species and strain of animal is recognized as appropriate on the basis of extensive experience with this strain and its suitability with respect to sensitivity to endocrine modulators. In addition the other laboratories in the interlaboratory validation will be using the same species, strain and source. WIL Research Laboratories, LLC has historical control data in this species and strain of rat.

6 SPECIFIC MAINTENANCE SCHEDULE:

6.1 Animal Housing:

The animals will be individually housed in clean suspended wire-mesh cages in an environmentally controlled room during acclimation. The cages will be elevated above cage-board or other suitable material, which will be changed at least three times each week (more if necessary). The cages will be subjected to routine cleaning at a frequency consistent with maintaining good animal health and WIL Standard Operating Procedures. The facilities at WIL Research Laboratories, LLC are fully accredited by the Association for Assessment and Accreditation of Laboratory Animal Care International (AAALAC International).

6.2 Environmental Conditions:

Controls will be set to maintain an average daily temperature of 71 ± 5°F (22 ± 3°C) and an average daily relative humidity of 50 ± 20%. Temperature and relative humidity will be monitored continuously. Data for these two parameters will be scheduled for automatic collection on an hourly basis. Fluorescent lighting controlled by light timers will provide illumination for a 12-hour light/dark photoperiod. Temporary adjustments to the light/dark cycles may be made to accommodate protocol-specified activities. The ventilation rate will be set at a minimum of 10 room air changes per hour, 100% fresh air.

6.3 Drinking Water:

Reverse osmosis-purified water will be available *ad libitum*. Filters servicing the automatic watering system are changed regularly according to WIL Standard Operating Procedures. The municipal water supplying the laboratory is analyzed according to WIL Standard Operating Procedures on a routine basis to assure that contaminants are not present in concentrations that would be expected to affect the outcome of the study.

6.4 Basal Diet:

Teklad 2018 diet (low phytoestrogen) will be offered *ad libitum* during the study. The lot of certified feed used on this study will be specified by the Sponsor and will have a genistein-equivalent content (aglycone) of less than 300 µg/g (Owens, 2003). Periodic analyses of the certified feed are performed by the manufacturer to ensure that heavy metals and pesticides are not present at concentrations that would be expected to affect the outcome of the study. Results of the analyses will be requested by WIL Research Laboratories, LLC of the manufacturer and will be placed in the study records. Feeders will be changed and sanitized once per week.

7 EXPERIMENTAL DESIGN:

7.1 Animal Receipt and Quarantine:

Each rat will be inspected by a qualified technician upon receipt. Rats judged to be in good health and suitable as test animals will be immediately placed in quarantine for a minimum of seven days. All rats will be initially weighed and permanently identified with a metal ear tag. During the quarantine period, each rat will be observed twice daily for changes in general appearance and behavior and weighed two more times. Prior to the start of the in-life phase, those rats judged to be suitable test subjects will be identified.

7.2 Randomization:

At the conclusion of the quarantine period, rats will be released by the laboratory veterinarian as suitable test subjects and meeting acceptable body weight requirements for assignment to the study. Animals will be divided by computerized, stratified randomization based on pre-study body weights into seven groups of 15 rats each so that there are no statistically significant differences among group body weight means.

7.3 Route and Rationale of Test Substance Administration:

The route of administration will be oral (gavage). Historically, this route has been used extensively for studies of this nature. Appropriate-sized flexible, Teflon®-shafted, stainless steel ball-tipped dosing cannulae will be used for the oral administration by gavage.

7.4 Organization of Test Groups, Dosage Levels and Treatment Regimen:

7.4.1 Test Substance and Dose Level Rationale:

Test substances selected have been chosen by the Sponsor to represent a couple of different modes of action. Each of the test substances have previously been run in the adult male assay with results documented in a review publication (O'Connor, 2002; Sloan, 2005). Based on the results of those studies, the high dose level is not expected to exceed the maximally tolerated dose (body weights at necropsy should be within approximately 10% of the control group). The lower dose levels were selected to assess dose-response relationships.

7.4.2 Organization of Test Groups:

The dosage levels were determined from the results of previous studies and were provided by the Sponsor Representative. The following table presents the groups with each test substance coded and the dose level described in general terms. The actual substances and dose levels are described in Section 4.

Group	Test Substance and Dosage Level Code	Dose Volume (mL/kg)	Number of Males
1	A	5	15
2	B	5	15
3	C	5	15
4	D	5	15
5	E	5	15
6	F	5	15
7	G	5	15

Note: Each group will be assigned a letter designation for the purposes of collecting animal data blinded to the test and control substance and dose level.

7.4.3 Vehicle Control Substance:

0.25% methylcellulose in water. (formulated methylcellulose provided by the Sponsor, as supplied by Sigma-Aldrich, Lot #14601TC).

7.4.4 Treatment Regimen:

Dose administration will be performed blind to treatment group. The formulated test and vehicle control substances will be administered once daily by oral gavage for 15 consecutive days (Test Day 1 through Test Day 15). Test Day 1 is the first day of dosing, not Study Day 0. Prior to dose administration, all formulations to be used for dosing that day will be removed from refrigeration and placed on a stir plate to vortex for at least 45 minutes. The formulations will continue to be stirred throughout dose administration.

On Test Days 1 through 14, dosing will start between 0600 and 0900 hr. On Test Day 15, dosing will start at approximately 0600 hr so that animals can have blood collected and be necropsied between 0800 and 1100 hr on Test Day 15 (starting 2 to 3 hours after dosing). On the day of necropsy, the time of dosing will be recorded for each animal. In addition, on the last day of dosing, the animals will be dosed across groups so that one animal is dosed in each group prior to dosing the second animal in each group.

7.4.5 Adjustment of Dosages:

Individual doses will be calculated based on each daily body weight to provide the proper dosage except on Test Day 15, which will use the previous day's weight. Individual animal body weights and individual animal dosages will be recorded.

7.5 Preparation and Analysis of Test Substance Formulations (Not blinded to Treatment Group):

7.5.1 Method and Frequency of Preparation:

Dosing formulations will be prepared in general accordance with Sponsor-provided formulation instructions. The dose formulations will not be corrected for purity. Dosing formulations of each test and vehicle control substance will be prepared once for use on-study, aliquoted into amber bottles with stir bar per group, sampled as described below and stored refrigerated. Dose formulation aliquots dispensed for dose administration will be assigned a group number and letter designation for the purposes of conducting animal activities and data collection blind to the test and control substance, dose level and dose concentration (this procedure and the group assignments will be documented in the pharmacy study records). The Study Director or the Deputy Director or designee will visually inspect all formulations. This visual inspection

will be performed to assure that the formulations are visibly homogeneous.

7.5.2 Homogeneity, Stability, and Concentration of Test Substance Formulation:

Samples from the top, middle and bottom strata of each batch volume formulation will be collected and analyzed for homogeneity and concentration prior to Test Day 1. The concentrations will be within 10% of target and homogeneity will have a percentage difference between top and bottom concentrations of 5% or less before they will be approved for dose administration. Samples from the top and bottom strata will also be collected on the last calendar dosing day (Test Day 15) and analyzed for resuspension homogeneity and stability. For both samplings, extra samples will be collected for back-up.

The WIL Analytical Chemistry Department will conduct an analytical method transfer validation for each test substance based on validated methods provided by the Sponsor. The Sponsor will provide analytical method instructions. Any samples or back-up samples will be discarded after issuance of the Final Report.

7.6 General Observations During the Experimental Period (Blinded to Treatment Group):

7.6.1 Clinical Signs:

The rats will be observed twice daily for appearance, behavior, moribundity and mortality. A detailed physical examination will be conducted on the day of randomization and daily prior to dose administration (except on Test Day 15). Observations shall include, but are not limited to, evaluations for changes in appearance of the skin and fur, eyes and mucous membranes, respiratory, circulatory, autonomic and central nervous system functions, somatomotor activity and behavior patterns. Observations will be recorded. On Test Days 1 through 14, the rats will also be observed approximately one hour following dosing and the observations will be recorded.

7.6.2 Body Weights:

Body weights will be recorded individually on a daily basis in the morning from Test Day 1 to Test Day 15, inclusively. On Test Day 15, live body weights will be recorded after dosing due to time constraints. Therefore, the body weight recorded on Test Day 14 will be used to determine the dose volume used for Test Day 15 dose administration.

7.6.3 Food Consumption:

Individual food consumption data will be recorded on Test Day 1, 8 and 15. Food intake will be reported as g/kg bodyweight/day.

7.7 Deaths and Animals Euthanized *in Extremis*:

Animals not surviving until the scheduled euthanasia will be necropsied and cause of death recorded, if possible. Rats not expected to survive to the next observation period (moribund) will be euthanized by carbon dioxide inhalation and subjected to a gross necropsy. Tissues with unusual gross findings will be preserved in 10% neutral-buffered formalin. All carcasses will be discarded.

8 POST-MORTEM EXAMINATION (BLINDED TO TREATMENT GROUP):

8.1 Blood Collection and Macroscopic Examination:

On the morning of Test Day 15 following dosing, all surviving study animals will be moved to the necropsy holding room and held for at least 1 hour before euthanasia of study animals is scheduled to begin (to minimize stress-induced changes in hormone levels related to cage transport). Animals will not be fasted prior to euthanasia. Rats will be exposed to carbon dioxide for up to 60 seconds (no more), then each rat will be euthanized by decapitation and the time of euthanasia will be recorded. Blood will be collected via the site of decapitation as described below. Rapid euthanasia is necessary because of the likelihood that undue stress associated with anesthesia alone will interfere with the accurate measurement of the various hormones that are essential endpoints with this assay (Holson, 1992).

The order in which animals will be necropsied for blood and tissue collection will be stratified across all groups, corresponding to the order in which the animals were dosed. Time of euthanasia for all animals should occur between 0800 and 1100 hr (2 to 3 hours after final dose) in order to minimize variability associated with serum hormone measurements.

Immediately following euthanasia, trunk blood will be collected (as much as possible) into a serum separator tube(s). Tubes containing blood will be kept on ice until serum is prepared. Blood samples will then be centrifuged for isolation of serum. Aliquots of serum should be made based on the number of different assays that will be run in a day to minimize the potential freeze and thaw effect on hormone concentrations. Serum will be stored in a freezer set to maintain ≤ -65°C for subsequent hormone analyses (see Section 9). Extra serum will be stored at ≤ -65°C. Remaining serum samples will be discarded after issuance of the final report.

The necropsy examinations will include the external surface, all orifices, the external surface of the brain and the thoracic, abdominal and pelvic cavities including viscera. Organs/tissues to be weighed and preserved are described below. Tissues with gross findings will be preserved for possible histopathologic examination in 10% neutral-buffered formalin, if possible (unless different fixative is described below).

8.2 Organ Weights:

The following tissues will be weighed (to the nearest 0.1 mg) from all animals:

Liver	Right Testis
Entire prostate[1]	Left Testis
Seminal vesicles with fluid and coagulating gland[2]	Epididymides[2]
Thyroid[3]	

[1]- dorsolateral and ventral prostate
[2]- weighed as paired organs
[3]-weighed following fixation and dissection described in section 8.3 below

With the exception of the thyroid trimming described below, organ harvesting and weighing procedures will be divided as equally as possible among the prosecting and weighing technicians, such that all animals from a group are not processed by a single individual (operator number will be recorded) in order to minimize systematic bias in the weighing procedures,

8.3 Tissue Fixation and Processing (Not blinded to Treatment Group):

Left and right testes and epididymides, liver and thyroids from all animals will be fixed as described below. The testes will be placed in Bouin's fixative for approximately 24 hours, after which they are rinsed and stored in 70% alcohol until histological processing. The epididymides and liver from each rat will be placed in 10% neutral-buffered formalin. The thyroid, with attached trachea, is fixed in 10% neutral-buffered formalin for at least 48 hours. Then the thyroid is dissected under a dissecting microscope from the trachea, blotted, weighed and placed in 10% neutral-buffered formalin until histological processing. The fixed thyroid dissection will be performed by one individual in order to reduce the variability of the dissection procedure and hence reduce the variability of the thyroid weights.

The testes, epididymides and the thyroid from only the control and high dose animals for both test substances will then be embedded in paraffin, sectioned and stained with hematoxylin and eosin (H&E) for subsequent histological evaluations. Sections of 2-4 microns will be made for the testis (transverse) and for the epididymis (longitudinal). Histological processing of the fixed livers and

the low and mid-dose of the testes, epididymides and thyroid will be performed at the discretion of the Study Director.

8.4 Microscopic Evaluation (Not blinded to Treatment Group):

Left and right testes and epididymides and thyroid histology from the control and high dose groups should be evaluated for pathologic abnormalities and potential treatment-related effects. A minimum of two sections per thyroid should be evaluated. Microscopic evaluations on the tissues from lower dose groups will be done by amendment if necessary. Liver only will be evaluated microscopically at the discretion of the Study Director and Sponsor.

9 HORMONE ASSAYS (BLINDED TO TREATMENT GROUP):

The following hormones will be analyzed from serum samples from all animals:

Testosterone	Luteinizing Hormone (LH)
Estradiol	Prolactin
Dihydrotestosterone (DHT)*	Thyroid-Stimulating Hormone (TSH)
Follicle-Stimulating Hormone (FSH)	Thyroxine (T_4)
	Triiodothyronine (T_3)

*DHT levels will only be measured at the discretion of the Study Director.

All hormones will be measured using commercially available radioimmunoassay (RIA) kits specified by the Sponsor. The sequence in which the hormones should be assayed is testosterone, LH, TSH, T_4, T_3, FSH, estradiol and prolactin. If serum is limiting, the Study Director should contact the Sponsor to establish a priority list of hormones to be measured.

Each assay should include all samples from the control group and each dose level for both chemicals, except for re-analysis of specific samples that may be out of range of the standard curve. Each serum sample should be run in duplicate. Each assay should include high and low quality control (QC) samples. The QC standards for FSH, LH, TSH and prolactin will be obtained from the National Hormone and Pituitary Program, and QC standards for testosterone, estradiol, dihydrotestosterone (if necessary), T_4 and T_3 will be obtained from a commercial supplier. For the QC samples, the buffer/medium in which the standards are prepared will be spiked with respective QC hormones at concentrations that are expected to encompass 70% B/B_0 (±10%) and 30% B/B_0 (±10%). The results of the QC samples may be used to assess within- and between-assay variability as appropriate.

10 DURATION OF STUDY:

The conduct of the in-life phase of this study will require approximately 3 weeks for acclimation, dosing and necropsy.

11 STATISTICAL METHODS:

Endpoints for the statistical analysis described below include the following:

Test Day 15 body weight
Body weight change, TD 1-8, 8-15, 1-15
Food consumption (g/kg/day only), TD 1-8, 8-15, 1-15
Absolute organ weights (9 total)
Organ weights relative to final body weight (9 total)
Hormones (8, 9 if DHT is included)

In addition to the 7 organ weights collected per animal at necropsy, paired testes weights (left plus right testis) and the accessory sex gland unit weights (entire prostate plus the seminal vesicles with fluid and coagulating gland) will be calculated per animal and analyzed. Based on 9 absolute organ weight values, 9 relative organ weight values, 9 possible hormones and the 7 body weight and food values, there is a total of 34 possible endpoints to be evaluated statistically. Outlier screens may be carried out prior to analysis following Grubbs analysis (1969) and an evaluation of normal probability plots. Tests for heterogeneity of variance will be carried out on the data (excluding the values identified as potential outliers) using a one-way analysis variance model fitted to the data including the fixed factor of treatment and the residual replicate per treatment. Following heterogeneity of variance evaluation, transformation of the data may be performed as appropriate to minimize heterogeneity of the data. Subsequent analyses will be carried out based on this transformed data.

A one-way analysis of variance (ANOVA) model will be fitted to the data to estimate treatment effects for each endpoint described above (SAS 9.1 for Windows). Two-tailed significance levels at 0.05 and 0.006 will be reported for each endpoint as appropriate. The data used for the above-described analyses will exclude potential outliers and may be performed on transformed versions of the variables. The factors in the ANOVA models will include treatment and residual replicate (treatment). Linear trend statistics will also be evaluated using the means of two-sample t-tests. Summary statistics may be back transformed to the original scale for the purposes of data presentation (Miller, 1966). A detailed description of the statistics will be provided in the report.

12 DATA SUMMARY:

The following tables and figures for each test substance along with the respective control will be provided:

12.1 Test Substance-Specific Body Weight and Food Consumption Summary Tables:

Table 1 and 2 (one for each test substance) will display summary values for the final live body weight (TD 15), body weight change intervals (TD 1-8, 8-15 and 1-15), and food consumption (g/kg/day) intervals (TD 1-8, 8-15, 1-15). For each endpoint and each dose and control group the following will be reported:

- mean +/- SE
- coefficient of variation
- number of animals per group
- mean as a percent of control group mean +/- SE

In addition the linear trend slope contrast will be estimated for each test substance based on the control group and the three graded dose groups. The estimated treatment slope and its standard error will be reported.

12.2 Test Substance-Specific Organ Weight and Hormone Summary Tables:

Tables 3 and 5 (one for each test substance) will display summary statistics described in Section 12.1 for the nine absolute organ weights.

Tables 4 and 6 (one for each test substance) will display summary statistics described in Section 12.1 for the nine relative organ weights (to final body weight).

Tables 7 and 8 (one for each test substance) will display summary statistics described in Section 12.1 for all hormonal analyses (8 or 9).

Tables 1 through 8 will be based on all the available data. Tables 9 through 16, if needed, will be a repetition of Tables 1 through 8, but based on the data excluding the flagged potential outliers.

12.3 Endpoint Summary Figures:

All figures will include all the available data.

Figures 1 and 2 (one for each test substance) will display, in a line graph, the mean body weight for each Test Day from TD 1 through TD 15 for the control group and each of the three dose levels per test substance.

Figures 3 through 9 (each containing all 7 dose groups on study) will display, in a scatter plot, the Test Day 15 mean absolute body weight, the 3 mean body weight change intervals, and the 3 mean food consumption intervals listed in Section 12.1, +/- 2 standard errors.

Figures 10 through 18 (each containing all 7 dose groups on study) will display, in a scatter plot, the mean absolute organ weight for each organ, +/- 2 standard errors.

Figures 19 through 27 (each containing all 7 dose groups on study) will display, in a scatter plot, the mean hormone concentration +/- two standard errors for each hormone (as applicable), +/- 2 standard errors.

13 QUALITY ASSURANCE:

The study will be audited by the WIL Quality Assurance Unit with in-phase inspections to assure compliance with the study protocol and protocol amendments, WIL Standard Operating Procedures and the appropriate provisions of the EPA TSCA and FIFRA Good Laboratory Practice Standards published in the Federal Register (40 CFR Part 792 and 40 CFR Part 160), MAFF Japan Good Laboratory Standards (59 NohSan No. 3850, 10-Aug-1984) and OECD Principles of Good Laboratory Practice [C(97)186/Final November 26, 1997] Good Laboratory Practice Standards. The raw data and draft report will be audited by the WIL Quality Assurance Unit prior to submission to the Sponsor to assure that the Final Report accurately describes the conduct and the findings of the study. Quality control (QC) and quality assurance (QA) procedures will follow those outlined in the Quality Assurance Project Plan (QAPP) that has been prepared for this study.

Data requiring statistical analysis will be analyzed by the Sponsor (Dr. Feder of Battelle) following the standard operating procedures of Sponsor and in accordance with GLPs listed above. Quality Assurance monitoring of these analyses and the results for SOP and GLP compliance is the responsibility of Battelle. Inspection reports will be supplied to the Study Director. Upon completion of the prescribed activities and submission of the results to the Study Director, Battelle will provide a signed Quality Assurance statement to the Study Director. The results will be incorporated into the Data Summaries described in Section 12 and presented in the final report.

This study will be included on the WIL master list of regulated studies.

14 RECORDS TO BE MAINTAINED:

All original raw data records, as defined by WIL SOPs and the applicable GLPs, will be stored as described in Section 15 in the Archives at WIL Research Laboratories, LLC.

All original raw data records generated at Battelle (statistical analysis) will be retained at Battelle.

15 WORK PRODUCT:

The Sponsor will have title to all documentation records, raw data, slides, specimens and other work product generated during the performance of the study. All work product, including raw paper data, pertinent electronic storage media and specimens will be returned to the Sponsor after a period of six months following issuance of the final report. All work product will be stored in compliance with regulatory requirements.

WIL will provide individual data in an electronic format for the statistical analysis. Battelle will provide the results of the statistical analysis (described in Section 11) in electronic format for the generation of the Data Summaries described in Section 12.

Any work product, including documents, specimens, and samples, that are required by this protocol, its amendments, or other written instructions of the Sponsor, to be shipped by WIL Research Laboratories, LLC to another location will be appropriately packaged and labeled as defined by WIL's SOPs and delivered to a common carrier for shipment. WIL Research Laboratories, LLC will not be responsible for shipment following delivery to the common carrier.

16 REPORTS:

The final report will contain a summary, methods and procedures, summary tables and figures, animal data, and an interpretation and discussion of the study results.

Draft final and final reports will be written. The draft final report, audited summary tables, and electronic copy of individual data spreadsheets will be submitted to the Sponsor. It is expected that the Sponsor will review the draft report and provide comments to WIL within a two-month time frame following submission. WIL will submit the final report in a timely manner following receipt of comments. One electronic copy (PDF format) will be provided; requests for additional copies of the final report may result in additional charges.

17 ANIMAL WELFARE ACT COMPLIANCE:

This study will comply with all applicable sections of the Final Rules of the Animal Welfare Act (AWA) regulations (9 CFR Parts 1, 2 and 3). The Sponsor should make particular note of the following:

- The Sponsor Representative's signature on this protocol documents for the Study Director the Sponsor's assurance that the study described in this protocol does not unnecessarily duplicate previous experiments.

- Whenever possible, procedures used in this study have been designed to avoid or minimize discomfort, distress or pain to animals. All methods are described in this study protocol or in written laboratory standard operating procedures.

- Animals that experience severe or chronic pain or distress that cannot be relieved will be painlessly euthanized as deemed appropriate by the veterinary staff and Study Director. The Sponsor will be advised by the Study Director of all circumstances which could lead to this action in as timely a manner as possible.

- Methods of euthanasia used during this study are in conformance with the above-referenced regulation.

- The Sponsor/Study Director has considered alternatives to procedures that may cause more than momentary or slight pain or distress to the animals and has provided a written narrative description (AWA covered species only) of the methods and sources used to determine that alternatives are not available.

18 PROTOCOL MODIFICATION:

Modification of the protocol may be accomplished during the course of this investigation. However, no changes will be made in the study design without the written permission of the Sponsor. In the event that the Sponsor requests or approves a change in the protocol, such changes will be made by appropriate documentation in the form of protocol amendment. All alterations of the protocol and reasons for the modification(s) will be signed by the Study Director and the Sponsor Representative.

19 REFERENCES:

Grubbs, F. Procedures for detecting outlying observations in samples. *Technometrics,* **1969,** *11*, 1-21.

Holson, R.R. Euthanasia by decapitation: evidence that this technique produces prompt, painless unconsciousness in laboratory rodents. *Neurotoxicology and Teratology* **1992**, *14*, 253-257.

Miller, Jr., R.G. *Simultaneous statistical inference*; McGraw-Hill Book Company: New York, NY, **1966**; pp. 67-70.

O'Conner, J.C.; Frame, S.R.; Ladics, G.S. Evaluation of a 15-day screening assay using intact male rats for identifying antiandrogens. *Toxicological Sciences* **2002**, *69*, 92-108.

Owens, W.; Ashby, J.; Odum, J. and Onyon, L. The OECD program to validate the rat uterotrophic bioassay. Phase 2: dietary phytoestrogen analyses. *Environmental Health Perspectives*, **2003**, *111(12)*, 1159-67.

Sloan, C; Tyl, R.W.; George, J.D.; Vick, K.D.; Pearce, S.W.; Hamby, B.T.; Myers, C.B.; Marr, M.C. 15-day Tier 1 screen of endocrine active compounds administered by gavage to adult male Sprague-Dawley® rats. RTI International. Research Triangle Park, NC. **2005**, Final Report 65U-08055.001.021.

20 PROTOCOL APPROVAL:

Sponsor approval received via email on 3-OCT-2005.
Date

Battelle Memorial Institute

David P. Houchens, PhD — 10/4/05 Date
Program Manager
Endocrine Disruptor Screening Program

WIL Research Laboratories, LLC

Christopher J. Bowman, PhD — 3-OCT-2005 Date
Study Director

Mark D. Nemec, BS, DABT — 3-Oct-2005 Date
Director, Developmental and
Reproductive Toxicology

21 PROTOCOL REVIEW:

Heather L. Osborn, BS, RQAP-GLP — 5-Oct-2005 Date
Manager, Quality Assurance
WIL Research Laboratories, LLC

Terri L. Pollock, BA — 10-4-05 Date
Quality Assurance Manager
Endocrine Disruptor Screening Program
Battelle Memorial Institute

1.0 TITLE AND APPROVAL SHEET

Inter-Laboratory Validation of the 15-Day Adult Intact Male Rat Assay

Work Assignment 5-15

for

EPA Contract Number 68-W-01-023

September 20, 2005

SIGNATURE PAGE

Quality Assurance Project Plan for WA 5-15

Inter-Laboratory Validation of the 15-Day Adult Intact Male Rat Assay

EPA Contract Number 68-W-01-023

Concurrences and Approvals

	Signature	Date
Terri L. Pollock, B.A. EDSP Quality Assurance Manager Battelle Columbus, OH	Terri L Pollock	9-19-05
David P. Houchens, Ph.D. EDSP Program Manager/Battelle Work Assignment Leader Battelle Columbus, OH	David P. Houchens	9/19/05
J. Thomas McClintock, Ph.D. Quality Assurance Manager U.S. EPA Washington, DC	J. Thomas McClintock	9/20/05
Linda Phillips, Ph.D. EPA Project Officer U.S. EPA Washington, DC	Linda Phillips	9/20/05
Don Bergfelt, Ph.D. EPA Work Assignment Manager U.S. EPA Washington, D.C.	D Bergfelt	9/20/05

2.0 TABLE OF CONTENTS

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LIST OF FIGURES

3.0 DISTRIBUTION LIST

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4.0 WORK ASSIGNMENT ORGANIZATION

The US Environmental Protection Agency (EPA) is implementing the Endocrine Disruptor Screening Program (EDSP). To support this program, the EPA has contracted with Battelle to provide comprehensive toxicological and ecotoxicological testing services, including chemical, analytical, statistical, and quality assurance (QA)/quality control (QC) support, to assist EPA in developing, standardizing, and validating a suite of *in vitro* and in vivo mammalian, and ecotoxicological screens and tests for identifying and characterizing endocrine effects through exposure to pesticides, industrial chemicals, and environmental contaminants. The studies conducted will be used to develop, standardize and validate methods, prepare appropriate guidance documents for peer review of the methods, and develop technical guidance and test guidelines in support of the Office of Prevention, Pesticides and Toxic Substances regulatory programs. The inter-laboratory validation studies will be conducted under the EDSP Quality Management Plan (QMP), study protocol, applicable Quality Assurance Project Plans (QAPPs), relevant program and facility Standard Operating Procedures (SOPs) and guidance documents.

One of the assays recommended for validation and consideration for inclusion in the screening program is the 15-Day Adult Intact Male Rat Assay.

According to the requirements of the work assignment for this assay the study is to be conducted by three laboratories (Research Triangle Institute [RTI], Research Triangle Park, NC, WIL Research Laboratories, Ashland, OH; and Charles River-ARGUS Division, Horsham, PA). This QAPP will address work to be conducted on this study. A summary of the Work Assignment Organization for the adult male assay is shown in Figure 4-1.

Portions of this work assignment will be managed at RTI, WIL, and ARGUS. At each of these laboratories, there will be a person responsible for preparing the protocol, assigning appropriate staff to complete specified tasks within the protocol, and monitoring the progress of both technical and fiscal milestones as outlined in the technical work plan. A study director from each laboratory will report on the progress of the work assignment to **Dr. David P. Houchens** at Battelle through a series of planned conference calls and through the use of written monthly reports.

General scientific direction and supervision of the work performed under this work assignment will be provided by **Dr. Houchens,** Battelle. All technical questions will be forwarded to EPA for clarification.

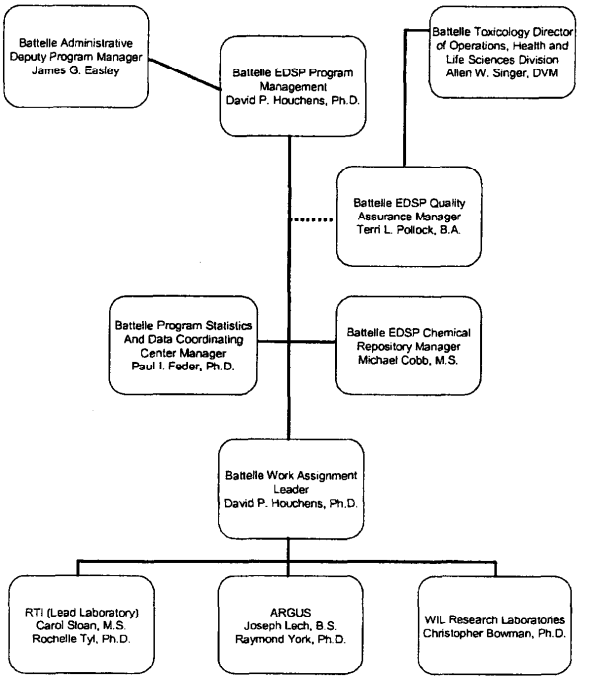

Figure 4-1. WA 5-15 Work Assignment Organization Overview

Each laboratory will have a study director in charge of overseeing the daily operation and conduct of the study. The individual laboratory teams will execute the necessary tasks required in the study protocols and ensure the data are collected and handled appropriately. All of these tasks are clearly defined in the study protocol.

The QA tasks are summarized as follows:

- Assist the Work Assignment Leader (WAL) in preparing the individual QAPP as required for the WA by defining appropriate QA requirements according to EPA/QA-R5, EPA Requirements for Quality Assurance Project Plans for Environmental Data Operations.

- Interact with the WAL to ensure that QA and QC procedures are understood by WA personnel.

- Conduct technical systems audits (TSAs) and audits of data quality (ADQs) to evaluate the implementation of the program WAs with respect to the EDSP QMP, the WA QAPP and protocol, and applicable program and facility SOPs.

- Prepare and track reports of deficiencies and submit them to both line and program management.

- Consult with the WAL and, as necessary, the EDSP Battelle QA Manager and Program Manager on actions required to correct deficiencies noted during the conduct of the WA.

- Ensure that all data produced as part of the EDSP WAs are maintained in secure, environmentally-protected archives.

- Ensure, during the conduct of TSAs, that all staff participating on the EDSP are adequately trained.

- Maintain complete facility-specific QA records related to the program.

- Submit copies of resolved audits to the EDSP Battelle QA Manager.

- Submit a QA Statement to the EDSP Battelle QA Manager and Program Manager with each written deliverable, which describes the audit and reviews activities completed.

- Maintain effective communication with the EDSP QA Managers.

- Act as the facility's EDSP SOP Custodian for all SOPs received from the SOP Administrator.

As EDSP program manager, **Dr. David Houchens** will have ultimate responsibility for quality, timeliness, and budget adherence for all activities on the contract. He also will serve as the principal interface with the EPA's project officer on all contract-level administrative and technical issues. Because of the high level of subcontracting and purchases required by the program, such as test laboratory subcontracts and purchases of chemical supplies, Dr. Houchens will be assisted by an administrative deputy manager, **Mr. James Easley**. Mr. Easley will manage the procurement of all subcontracts, consultants, and purchased materials and services, and will facilitate schedule and cost control. He has played a similar role on ten other large, multi-year, level-of-effort task-order contracts for EPA. Thus, he will be able to assure that all purchases are compliant with government regulations and that EPA is provided timely, accurate accounting of these substantial costs in our monthly progress reports.

Ms. Terri Pollock, the EDSP QA manager at Battelle, will direct a team of QA specialists, who will monitor the technical activities on the chemical repository program, and provide oversight to all associated QA functions. Ms. Pollock will be responsible for reporting

her findings and any quality concerns to Dr. Houchens. Ms. Pollock reports, for the purposes of this program, to **Dr. Allen Singer**, Vice President and General Manager of Battelle's Environmental Division. This reporting relationship assures that the QA function is independent of the technical activities on the program.

5.0 PROBLEM DEFINITION/BACKGROUND

5.1 Problem Definition

The Food Quality Protection Act of 1996 requires the EPA to develop and implement a screening program using valid tests for determining the potential for estrogenic, androgenic and thyrotropic-like effects from pesticides, industrial chemicals and environmental contaminants in humans. EPA proposed a two-tiered screening and testing program in a Federal Register notice in 1998 (63 FR 71542-71568, Dec. 28, 1998) that covered not only pesticides but also commercial chemicals subject to regulation under the Toxic Substances Control Act (TSCA; 15 USC 2601) and environmental and drinking water contaminants. One of the assays recommended by the Endocrine Disruptor Screening and Testing Advisory Committee (EDSTAC) as an alternate assay for inclusion in the screening program is a short term screen in an adult intact male rat. The adult male assay was developed to identify compounds that have the potential to act as agonists or antagonists to the estrogen, androgen, progesterone, or dopamine receptor; 5 α-reductase inhibitors; steroid biosynthesis inhibitors; or compounds that alter thyroid function.

5.2 Background

This *in vivo* assay was developed to identify compounds that have the potential to act as agonists or antagonists to the estrogen, androgen, progesterone, or dopamine receptor; 5α-reductase inhibitor; steroid biosynthesis inhibitors; and compounds that alter thyroid function. Results from this assay and/or with the use of ip injection as the route of administration, and other assays with a similar purpose, have been reported (O'Connor et al., 1999b, 2002a,b). The duration should be sufficient to detect effects on thyroid gland activity. The rats used are anatomically mature and have an intact hypothalamus-pituitary-gonadal (HPG) axis and therefore can be used for assessment of higher neuroendocrine control in male reproductive function and thyroid. It may: (1) be used as one of the protocols recommended by EDSTAC for the Tier 1 screening battery, and/or (2) serve as a follow-up test for certain substances for which additional data are required or desired.

The U.S. EPA selected two known test chemicals for evaluation. The two test chemicals and their target/mechanism of action are as follows: (1) linuron (anti-androgen; competitive binding to androgen receptor), and (2) phenobarbital (alters thyroid function).

5.2.1 Overview of Linuron

Linuron is an androgen receptor (AR) antagonist and competes with androgens for AR binding. It has been documented to inhibit androgen-induced gene expression *in vitro* and short-

term exposure to linuron reduces the size of androgen-dependent tissues *in vivo* . *In utero* linuron exposure appears to affect androgen-dependent development of the male reproductive system (McIntyre et al., 2000, 2002).

5.2.2 Overview of Phenobarbital

Animal studies show that exposure to phenobarbital in food or water harms the thyroid function in males and females. Phenobarbital induces P450 isoforms, predominantly in the liver, and accelerates the metabolism of hormones and exogenous xenobiotics.

6.0 WORK ASSIGNMENT/TASK DESCRIPTION

6.1 Work Assignment Overview

One of the alternate assays recommended for validation and consideration for inclusion in the screening program is the 15-day adult intact male rat assay. Briefly, adult male rats (15/group) are dosed daily for 15 days (test days 1 to 15) with the test compound and euthanized on the morning of Test Day 15, approximately 2-3 hours after the last administered dose. Blood samples are taken and selected organs are weighed and saved. Reproductive and thyroid hormone levels are measured and appropriate tissues are examined histologically.

6.2 Specific Study Objectives

The objectives of this study are to:

1) evaluate the ability of this assay to detect endocrine active compounds by measuring body and organ weight changes, histology, and changes in circulating concentrations of hormones.

2) demonstrate that three contract laboratories can adopt this assay by analyzing the repeatability of the results for each endpoint across laboratories.

7.0 QUALITY OBJECTIVES AND CRITERIA FOR MEASUREMENT DATA

In the adult male assay, the primary endpoints will be body weights and weights and histology of the liver, reproductive organs and thyroid and the hormone concentration values for luteinizing hormone (LH), follicle stimulating hormone (FSH), thyroid stimulating hormone (TSH), triiodothyronine (T3), throxine (T4), dihydrotestosterone (DHT), testosterone, prolactin and estradiol. The level of sensitivity of the assays will be evaluated by examining effects of chemicals known to affect the endocrine system through various pathways and/or mechanisms of action.

Chemicals known to affect the endocrine system and/or the thyroid gland should show significant differences in hormone levels, organ weights and histological measurements between treated and control animals.

Data Quality Indicators

1. Precision

For the animals used on this project, the acceptable weight range for acceptance into the study will be the mean weight $\pm$ 20%. Animals with weights outside this range will not be used in the study.

For body weight, the weight of the animal on the day of necropsy but before sacrifice should be within approximately 10% of the control group. Animals that have body weights higher than that prescribed will be considered to have been overexposed to the chemical.

For organ weights, any value that shows up as a statistical outlier on data analysis will be flagged and eliminated from the summary tables and reported separately. The values for absolute and relative organs weights from the treated groups will be compared to those of the vehicle control group.

For hormone level analysis, duplicate samples will be used and the relative standard deviation (RSD) and coefficient of variance (CV) will be calculated. These values will be determined for each hormone assay individually. If values are not within the accepted value (normally 10-20% CV), they will be flagged and the samples will be repeated on another assay.

2. Bias

For the animal data, bias will be controlled by using stratified randomization to select animals for the study. Animals that do not fall within the acceptable weight range will not be used in the study.

For the hormone analysis, bias will be determined by use of blank and spiked matrix samples. If these values are incorrect, the assay is not used and all of the samples will be re-run in another assay. The reason for the incorrect values would be further explored and explained in the report.

3. Accuracy

For hormone assays, accuracy is determined by including samples called standards with known concentrations of the hormone to be measured. These standards must fall within the CV set for the assay or the assay is not used to report unknowns. The unknowns will then be run in another assay with acceptable values for the standards.

4. Sensitivity

For hormone assays, the standard curve will be run and will show the ranges of sensitivity for the individual assay. Calculation of assay sensitivity will be reported. This is usually the most linear portion of the curve.

8.0 SPECIAL TRAINING/CERTIFICATION

All personnel involved in handling radiolabeled materials will have completed a Radiation Safety Training course. Training documentation will be maintained in the individual training files. Each laboratory will be licensed to receive radiolabeled materials

9.0 DOCUMENTS AND RECORDS

9.1 Retention of Specimens and Records

Archiving procedures will be specified in the individual protocols.

9.2 Quality Assurance Project Plan

This QAPP will be distributed to the project participants initially, and whenever revised. Previous versions will be marked as "obsolete" when newer versions are distributed, or collected and destroyed so that there is no confusion regarding the version in effect. The right-justified document control header example shown is used to ensure that revision numbers and dates are obvious to document users. The QAPP will be reviewed annually and a determination made to either modify the document based on new or modified project requirements, or leave as is.

Version 1
Month, Year
Page 1 of 1

Copies of the QAPP are maintained, tracked, and managed by the laboratories' QAU through the use of a master distribution list.

9.3 Data Reporting Package

All data forms will include a title identifying the type of data to be recorded, a unique study code or protocol number and the initials and date of data recorder(s) to authenticate the records.

9.4 Environmental Conditions

Monitoring of environmental conditions in the Animal Resources Facility (ARF) will be described in the individual laboratory protocols.

9.5 Reports

9.5.1 Draft and Final Reports

A draft report will be submitted to the Sponsor's Representative within three months after the completion of the laboratory studies. The final report will include:

- Objectives
- Abstract
- Materials and Methods
- Results
- Discussion
- Conclusions
- References
- Summary in-life and necropsy data with statistical analyses when possible
- Individual animal data: in-life and necropsy
- Protocol, any amendments, or any deviations from the protocol and all values flagged as outliers
- QAPP, any amendments, or any deviations from the QAPP
- Histopathology Report
- Analytical Chemistry

Individual Data Male Rats

a. Identification number
b. Clinical signs
c. Daily body weight and weekly body weight change and feed consumption
d. Age at death and manner of death
e. Body weight on the day of necropsy but before sacrifice
f. Organ weights
g. Gross Necropsy Observations
h. Serum Hormone levels
i. Histology

Summary of Data From Male Rats

a. Mean weekly body weights and weight changes
b. Mean weekly feed consumption
c. Clinical signs
d. Mean body weight on Test Day 15
e. Mean organ weights (absolute and relative)
f. Histopathology Data
g. Mean Serum Hormone Levels

9.5.2 QA Assessment Reports

QA assessment reports (see section 20) will be maintained as confidential files in the QAU. When a WA report is finalized, the QA assessment report file will be removed to a separate file location designated for those to be transferred to the archives.

9.5.3 Status Reports

Status/progress reports will be submitted to the EPA Project Officer on a monthly basis as stipulated in the contract.

10.0 EXPERIMENTAL DESIGN

The individual testing laboratory protocols will describe the experimental design.

10.1 Number and Type of Samples to be Collected

As much blood as possible will be taken after decapitation following pre-exposure to carbon dioxide for preparation of serum for hormone concentration determination of the treated and control animals at the time of necropsy. The liver, thyroid gland, right and left testes, entire prostate, epididymides, and seminal vesicles and coagulating gland with fluid will be removed and weighed at necropsy. The liver, epididymides, thyroid, and testes will be saved for histology.

10.2 Frequency and Types of Measurement to be Made

The **body weight** (in grams) of the animals will be determined for randomization, on the day before the experimental start day, on the morning of each day of the study, Test Day (TD) 1-14 for determination of dosing volume, and on the day of necropsy. The dosing volume for TD 15 dosing will be determined by the body weight on TD 14.

The **feed weights** (in grams) will be determined on TD 1, 8, and 15 and will be reported as g/kg body weight/day.

The **organ weights** (in grams) will be determined at necropsy, expect that total testes weight (combined weights of left and right testis) and accessory sex gland weight (combined weights of entire prostate and seminal vesicles and coagulating gland with fluid) will be determined post-necropsy.

The **hormone concentrations** testosterone, LH, TSH, T4, T3, FSH, estradiol, and prolactin will determined in this sequence. Only if relative liver weights are significantly increased should DHT levels be measured. The blood samples for serum will be collected 2-3 hours after the final dose is administered.

10.3 Rationale for Experimental Design

Body weights of the animals will give an indication of exposure of the compounds being administered and are necessary for the volume of compound to be administered and for the relative organ weights to be determined at the conclusion of the experiment.

Food consumption is expected to support dramatic changes in body weights.

Absolute and relative weights of the organs will give a further indication of overexposure and the histology will reveal if there is any organ damage at the cellular level.

Hormone concentrations will be used to indicate effects on the endocrine system and glands that secrete or respond to the hormone.

All the above measurements are considered critical to the objectives of the work assignment since all can be used for evaluation of assay performance among laboratories.

11.0 SAMPLING METHODS

11.1 Blood Samples for Endocrine Assays

As much blood as possible will be collected from the trunk of the animal after decapitation following pre-exposure to carbon dioxide for preparation of serum as described in the protocols of respective laboratories. If serum is limited, priority of analysis will be determined by the study director and sponsor and documented. Any remaining serum will be discarded after the study is completed and with the concurrence of EPA.

12.0 SAMPLE HANDLING AND CUSTODY

12.1 Dosage Formulations

The dosing solutions will be prepared at a frequency determined by stability tests performed prior to the start of the study.

12.2 Sample Collection Documentation

The aliquots will be transferred to the Analytical Chemistry Laboratories at each site with a study specific transfer of material form. Aliquots of each treatment concentration will include the designated Rx Code and Color Code specific to that study. The samples will be analyzed according to the procedures received from Battelle.

Each aliquot of sera will be labeled with the designated Rx Code and Color Code specific to that study as well as the unique animal identification number. The samples will be stored until time for the hormone determinations.

The tissues saved will be labeled with the designated Rx Code and Color Code specific to that study as well as the unique animal identification number and sent for histopathology assessment.

13.0 ANALYTICAL METHODS

Analytical methods are described in each study protocol and appropriate SOPs.

14.0 QUALITY CONTROL

14.1 Methods

Method	Acceptance Criteria	Corrective Action
Use of blanks	Blank values should be below 100 counts / minute (cpm), values are subtracted from sample values	Repeat assay with new blanks
Running duplicate samples	CV should be below 20%	Repeat samples in duplicate on a new assay
Running control samples	Should be within 20% CV of previous values	Rerun the entire assay

14.2 Data Collection

Data collection documentation will be as described in applicable SOPs.

Assay data, including weights and/or volumes of chemicals, solvents or other materials used to prepare necessary solutions or samples, will be recorded manually on data sheets. All data sheets will include a title identifying the type of data to be recorded, the unique study code or protocol number, and the initials and date of the data recorder(s) to authenticate the records.

15.0 INSTRUMENT/EQUIPMENT TESTING, INSPECTION, AND MAINTENANCE

The following types of equipment are required for this WA: temperature controlled shaking water bath, pH meter, analytical balances, centrifuges, pipettors, spectrophotometer, and high performance liquid chromatography (HPLC) equipment (injector, pumps, detectors [radiochemical and ultraviolet {UV}], data collection system). The equipment will be tested, inspected and maintained according to schedules contained in the relevant SOPs.

16.0 INSTRUMENT/EQUIPMENT CALIBRATION AND FREQUENCY

Balances used to obtain weight measurements, as well as the check weights that are used to verify a balance's calibration status will be calibrated and maintained according to the schedule specified in relevant SOPs. Balances that do not meet the criteria specified in the SOP will not be used for this work assignment.

Radiation counters will be calibrated using procedures described in the relevant SOPs. Calibration of pH meters occurs as specified in relevant SOPs. The water bath, pipettes, spectrophotometer, and HPLC equipment are calibrated using the procedures and schedule in applicable SOPs. Any equipment or instrument that does not meet acceptance criteria as described in the relevant SOP will not be used for this work assignment.

17.0 INSPECTION/ACCEPTANCE OF SUPPLIES AND CONSUMABLES

Upon receipt, purchased items must be inspected for conformance to quality requirements prior to use. All use of the product must be prior to the expiration dates if applicable.

Animals must be inspected and weighed by Charles River Laboratories, Raleigh, NC before shipment. They will be checked on at the laboratories for general health and appropriate age. They will be quarantined for at least seven days after arrival and checked daily for health. They must be released by the laboratory veterinarian for use on a study.

Food will be analyzed and the results are available and will be included in the final report.

Water will be from the deionized water sources at the laboratories. The main water used is analyzed and the results are available and will be included in the final report.

Hormone Assay Kits will be shipped to each participating laboratory. They will be then checked for total radioactivity, spillage, breakage and expiration date before release. They will be labeled with the date received, opened and expiration dates on the kits upon receipt.

18.0 NON-DIRECT MEASUREMENTS

No collection of any samples or sample data will be obtained from non-direct measures such as computer data bases or programs.

19.0 DATA MANAGEMENT

19.1 Data Management Overview

Data will be maintained in notebooks and/or files according to applicable facility SOPs. The records will be kept in the appropriate rooms until there is a signed final report at which time they will be inventoried and placed in the facility archives according to applicable facility SOPs, unless the sponsor requests that they be transferred to another archive location.

19.2 Data Transfer

Information will be sent to the Data Coordination Center in electronic format as specified in SOP EDSP.D-003-01. Specifically all raw data, all tables, graphs summarizing results of statistical analyses as presented in study reports, statistical analysis data files, statistical analysis programs, and all study documents will be sent to the EDSP Data Coordination Center in electronic format.

20.0 ASSESSMENTS AND RESPONSE ACTIONS

EDSP QA team members will perform assessments on WA activities and operations affecting data quality and the raw data and final report. They will report any findings to the Study Director and management to ensure that the requirements in relevant SOPs, study protocols and WA QAPP, the QMP, and the FIFRA GLPs are met. The assessments for this study include TSAs and ADQs. Performance Evaluations do not apply to this QAPP.

20.1 Technical Systems Audits

A TSA is a process by which the quality of a study is assessed through evaluating a study activity's conformance with the protocols, applicable facility or program SOPs, QAPP, QMP, and GLPs. The acceptance criteria are that WA activities and operations must meet the requirements of these planning documents and the GLPs or be explained and evaluated in a deviation report. Deviations from the GLPs, QAPP, protocol, or SOPs will be properly documented and assessed by management and the study director as to their impact on the study.

20.2 Type, Scheduling, and Performance of Technical Systems Audits

The following paragraphs provide an example of how the laboratories may perform technical system audits.

Prior to the experimental start, the facility QA Team Member will convey a list of inspections targeted for the study to the study director. Whenever possible, TSAs should be done at the commencement of the WA critical phase to ensure WA integrity based on compliance with the protocol, QAPP, SOPs, and GLPs. Critical phases targeted for TSAs include, but are not limited to:

- Protocol review
- Dose formulation and analysis
- Dose administration
- Necropsy

During the TSA, EDSP QA team members will record observations to be used later in preparing the audit report. EDSP QA team members will observe the procedure, data recording, and any equipment maintenance and calibration procedures and/or documentation, noting whether or not the activities adhered to the study protocols and QAPP, applicable SOPs, QMP, and the GLPs. Any findings will be communicated to the technical personnel at the completion of the procedure unless an error could compromise the study (e.g., misdiluting the stock solution). EDSP QA team members will immediately notify the Study Director by telephone and/or e-mail of any adverse findings that could impact the conduct of the study. This direct communication will also be documented in the audit report.

20.3 Audits of Data Quality

An ADQ is a process by which the accuracy of data calculations and reporting will be assessed to ensure that the reported results are of high quality and accurately reflect the raw data and accurately describe the materials used in the study. The acceptance criteria for the ADQ are that data collection, analysis, and reporting must meet the requirements of the applicable facility and program SOPs, the WA protocols and QAPP, QMP, and the FIFRA GLPs, or be explained and evaluated in a deviation report, as previously described.

20.4 Scheduling and Performance of Audits of Data Quality

Direct and frequent communication between the WA Leader/Study Director, laboratory supervisor, and the QA Manager will provide for sufficient time to perform an ADQ so that the submission date of the draft final report meets that specified in the study protocol. The scheduling process should also allow for a reasonable amount of time for corrections and subsequent verification of the corrections by QA.

EDSP QA team members will audit the study records at a frequency adequate to ensure that approved protocol requirements are met. The frequency required is specified by the type of data in the QMP, Section 2.4.1. Findings will be reported and corrective actions undertaken as described earlier. EDSP QA team members review the final report using the audited data and corrected tables. The report text will be reviewed to ensure that every statement is supported by the data and any discussions or conclusions drawn from the study are supported by the data. Findings will then be reported and corrective actions undertaken as described earlier.

20.5 Audit Report Format

The following paragraphs provide an example of how the laboratories may format an audit report.

The audit report consists of a cover page for study information and additional page(s) with the audit findings. All pages have header information containing the study protocol number, audit report date, and audit type. The audit report date is the date on which the EDSP QA team member signs the audit report and sends it to the Study Director and management.

The cover page contains the study protocol title, number, and code; Sponsor; Study Director; audit type; audit date(s); EDSP QA team member; distribution list; the dated signature of the auditor; the date that the Study Director received the audit report; and the dated signatures of the Study Director and management. The distribution list may include additional names for individuals who have findings pertaining to their area of responsibility (e.g., the ARF Manager would address a finding pertaining to the ARF) and is used to ensure that the report is sent to all who need to respond. Subsequent page(s) contain the audit finding(s), any recommended remedial actions, and space for the Study Director to respond to the findings and document remedial actions taken or to be taken.

20.6 Response Actions and Resolution of Issues

The Study Director will respond to the TSA report within a specified number of working days of receipt of the report as required by the laboratory's SOPs. There is no deadline for the Study Director's response to an ADQ report except for the time constraint deriving from the submission date of the final WA report. The Study Director forwards the audit report to management for review. Management adds comments as necessary, signs and dates the report and returns it to the EDSP QA team member. The EDSP QA team member assesses the responses and verifies the corrective actions. If a disagreement between the Study Director and EDSP QA team member arises over a finding, it will be discussed among the other EDSP QA team members. The EDSP QA team member will then present the majority opinion to the Study Director for further consideration. If the disagreement remains, the issue will be reported to the Study Director's management. The action decided on by management will be documented in the QA files.

During an assessment, if the auditor determines that adverse health effects could result or WA objectives of acceptable quality cannot be achieved, the auditor follows the Stop Work Procedure specified in the EDSP QMP (Section 3.3).

20.7 Independent Assessments

The EDSP Battelle QA Manager (QAM), or designee, may conduct an independent TSA and ADQ during the conduct of this work assignment. Typically one independent audit may be conducted during the work assignment. If major deficiencies are uncovered, additional independent audits may be scheduled. The conduct and reporting of the audits will be consistent with the procedures described in the EDSP QMP (Section 3.3).

In addition, the EDSP EPA QAM, or designee, has the option of conducting external TSAs/ADQs.

21.0 REPORTS TO MANAGEMENT

The QA Manager will send periodic reports to the study director and management, which detail significant regulatory, protocol, and SOP issues. Also, the participating laboratories will report to the EDSP Program Manager and WAL.

22.0 DATA REVIEW, VERIFICATION, AND VALIDATION

The data produced under this work assignment will be reviewed by the technical personnel for the validation process and by EDSP QA team members for the verification process (see section 23). The criteria used for validation depend on the type of data. For dose solution sample data, information regarding the condition of the containers and whether or not samples were compromised will be recorded in the sample chain-of-custody records. Compromised samples will not be analyzed. The criteria for validating data are those found in Section 7 (Data Quality Objectives).

23.0 VERIFICATION AND VALIDATION METHODS

23.1 Chain of Custody for Data

Study data, records, and specimens will be maintained in a secure and designated location, e.g., in the respective laboratory offices until study completion. Chain-of-custody procedures will be implemented according to facility SOPs. Chain-of-custody information, including the date, study record(s) removed or returned, and the name of the person removing or returning the data will be documented. At study completion, the Study Director will follow the procedures specified in the facility SOP for archiving study materials.

23.2 Data Validation

Data validation is a process by which the WA Leader/Study Director and/or other technical personnel evaluate the data for conformance to the stated requirements for methodology and quality. These personnel are responsible for reviewing the data, evaluating any technical deviations or non-conformances, and then determining the degree to which the data meet the quality criteria stated in Section 7.

23.3 Data Verification

Data verification constitutes part of the ADQ process performed by EDSP QA team members and described earlier. Verification ensures that 1) the data are of high quality and were collected according to the planning documents' requirements, and 2) the reported results accurately reflect the raw data. Each data type will be evaluated against its collection and

reduction requirements specified in the planning documents. Errors discovered during the data evaluation will be corrected. The reported conclusions drawn from the data are verified by EDSP QA team members during the report audit to confirm that they are true and accurate. The procedure for resolving issues of data verification has been detailed in prior sections of this document.

24.0 RECONCILIATION AND USER REQUIREMENTS

Proposed methods for data analysis, including a test for statistical outliers, are specified in the Study Plan and/or protocols.

25.0 REFERENCES

The following references were used to prepare the QAPP. Not all references are cited in the text.

Battelle (2003). Endocrine Disruptor Screening Program Quality Management Plan, Version 2. May 12, 2003.

Battelle (2004). Technical Work Plan on Microsomal Aromatase Validation Study, EPA Contract Number 68-W-01-023, Work Assignment 4-16. September 8, 2004.

FQPA (1996). Food Quality Protection Act of 1996, U.S. Public Law 104-170, 21 U.S.C. 46a(p), Section 408(p), 110 STAT.1489. August 3, 1996.

McIntyre, B.S., Barlow, N.J., Wallace, D.G., Maness, S.C.,Gaido, K.W., Foster, P.M.(2000). Effects of in utero exposure to linuron on androgen-dependent reproductive development in the male Csl:CD(SD)BR rat. *Toxicol. Appl. Pharmacol.* 167(2):87-89.

McIntyre, B.S., Barlow, N.J., Foster, P.M.(2002). Male rats exposed to linuron exhibit permanent changes in anogenital distance, nipple retention, and epididymal malformations that result in subsequent testicular atrophy. Toxicol Sci 65:62-70.

O'Connor, J.C., Davis, L.G., Frame, S.R., and Cook, J.C. (2000a). Detection of dopaminergic modulators in a Tier I screening battery for identifying endocrine-active compounds (EACs). Reprod. Tox. In press.

O'Connor, J.C., Davis, L.G., Frame, S.R., and Cook, J.C. (2000b). Evaluation of a Tier I screening battery for detecting endocrine-active compounds (EACs) using the positive controls testosterone, coumestrol, progesterone, and RU486. Toxicological Sciences, 54: 338-354.

O'Connor, J.C., Cook, J.C., Frame, S.R., and Davis, L.G. (1999a). Detection of the environmental antiandrogen p,p'-DDE in Sprague-Dawley and Long-Evans rats using a Tier I screening battery and a Hershberger Assay. Toxicological Sciences, 51: 44-53.

O'Connor, J.C., Frame, S.R., and Cook, J.C. (1999b). Detection of thyroid toxicants in a Tier I screening battery and alterations in thyroid endpoints over 28 days of exposure. Toxicological Sciences, 51: 54-70.

O'Connor, J.C., Cook, J.C., Slone, T.W., Frame, S.R., and Davis, L.G. (1998). An ongoing validation of a Tier I screening battery for detecting endocrine-active compounds (EACs). Toxicological Sciences, 46: 45-60.

O'Connor, J.C., Frame, S.R., Biegel, L.B., Cook, J.C., and Davis, L.G. (1998). Sensitivity of a tier I screening battery compared to an in utero exposure for detecting the estrogen receptor agonist 17 -estradiol. Toxicological Sciences 44: 169-184.