Data Requirement

EPA OPPTS 870.3650
OECD 422

STUDY NO. 03-4245

PROPANE: COMBINED REPEATED-EXPOSURE TOXICITY WITH REPRODUCTION/DEVELOPMENTAL TOXICITY AND NEUROTOXICITY SCREENING IN RATS VIA WHOLE-BODY INHALATION EXPOSURES

Final Report

VOLUME I OF II

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Submitted to: American Petroleum Institute (API)
1220 L Street, Northwest
Washington, D.C. 20005-4070

Attn: [redacted]

Date: 23 April 2010

STATEMENT OF COMPLIANCE

This study was conducted in compliance with the United States Environmental Protection Agency's Good Laboratory Practices as set forth in 40 CFR Part 792 (TSCA) and the Organization for Economic Cooperation and Development (OECD) Good Laboratory Practices as set forth in ENV/MC/CHEM/(98)17, with the following exceptions that did not effect the integrity of the study:

1. A lot number for the test substance was not available.
2. The actual location for the synthesis documentation of the test substance was not provided by the supplier.

[redacted]

[redacted]

Date

[redacted]

[redacted]

3/29/10

Date

SIGNATURE PAGE

SCIENTISTS

The following scientists were responsible for the overall conduct of this study. Departmental supervisory personnel are listed on the personnel page of this report (Appendix NN).

[redacted]

23 APR 10
Date

[redacted]

16th April 2010.
Date

SCIENTIFIC REVIEW

The following scientist has reviewed and approved this report.

[redacted]

14 APRIL 2010
Date

[1] [redacted] was the Study Pathologist for this study and for submission of the draft report and is no longer employed at the Testing Facility. [redacted] is assuming responsibility for finalization of the pathology evaluation of this report.

[2] [redacted] was the original scientific reviewer of this report and is no longer employed at the Testing Facility. [redacted] is assuming responsibility for final review of this report.

QUALITY ASSURANCE STATEMENT

Listed below are the dates that this study was inspected by the Quality Assurance Unit of Huntingdon Life Sciences, East Millstone, New Jersey, and the dates that findings were reported to the Study Director and Management.

Type of Inspection	Date(s) of Inspection	Reported to Study Director and Management
CATO Research Facility Inspection	14 May 03	30 Jan 04
GLP Protocol Review	5 Dec 03	8 Dec 03
Exposure, Monitoring & Equipment Records	19 Jan 04	19 Jan 04
Functional Observational Battery Evaluations, Motor Activity & Equipment Records	10 Feb 04	10 Feb 04
Clinical Pathology Blood Collection, Terminal Necropsy & Training Records	17 Feb 04	20 Feb 04
Maternal & Pup Sacrifice	1 Mar 04	1 Mar 04
Test Article Stability Analysis	19 Mar 04	24 Mar 04
Draft Final Report & Study Data	18, 21-25 & 28-30 Jun 04	30 Jun 04
Propane Post-Study Characterization & Stability Analytical Report & Data	23 Jul 04	23 Jul 04
Final Report Review	22, 24 Nov 08	24 Nov 08
Protocol Amendments Nos. 1-3	22 Apr 10	22 Apr 10

[redacted]

23 Apr 10
Date

PROPANE: COMBINED REPEATED-EXPOSURE TOXICITY WITH REPRODUCTION/DEVELOPMENTAL TOXICITY AND NEUROTOXICITY SCREENING IN RATS VIA WHOLE-BODY INHALATION EXPOSURES

SUMMARY

This study was designed to screen the potential toxicity, including neurotoxicity and reproductive performance in male and female rats when propane was administered by whole-body inhalation exposure. It also was designed to permit detection of effects on gonadal function that may not be evident from histological examination of the reproductive organs. In addition, for female rats this study can detect effects on conception, development of the conceptus and parturition and pup survival to lactation day 4.

The test substance was administered as a gas to Sprague Dawley CD® rats (12/sex/main study group and 12 females/satellite group) at target concentrations of 1200, 4000 and 12000 ppm for 6 hours/day, 7 days/week for 2 weeks prior to mating initiation (highest exposure level is 50% of the lower explosive limit). Exposure levels were determined using an infrared spectrophotometer (IR) 4 times per chamber per day. Main study females were evaluated for subchronic effects and satellite females for reproductive/developmental effects only. Main study male rats were exposed during the mating and post-mating periods, until euthanized, for a minimum exposure of 28 days. Main study female rats (12/group) were exposed once daily (6 hours/day), seven days/week for 4 weeks for a minimum of 28 days. Satellite female rats were exposed once daily (6 hours/day), seven days/week for at least two weeks prior to mating initiation. Satellite female rats continued to be treated once daily (6 hours/day) during mating. Once mated, satellite female rats were treated once daily (6 hours/day) during gestation (gestation days 0-19). Satellite female rats without evidence of mating continued treatment for 19 days (6 hours/day) following completion of the mating period and then held for an additional 7 days. The following parameters were evaluated in all animals: viability, clinical observations, body weights, feed consumption, Functional Observational Battery (FOB) and motor activity, clinical pathology (termination), organ weights, and macroscopic observations. Microscopic pathology (main study control and high-exposure groups only).

The test substance, purchased from MG Industries, was assayed by gas chromatography versus an analytical standard before and after the study to demonstrate the purity and stability of the test substance. The test substance was determined to be 99.91% propane before the study and 99.90% propane after the study demonstrating the purity and the stability of the test substance. Chamber distribution analyses showed that the test substance was evenly distributed within each chamber. The mean (± standard deviation) analytical (IR) concentrations for the control and the respective exposure groups were as follows: 0 ± 0, 1230 ± 34, 3990 ± 156, 12168 ± 415 ppm. Chamber environmental conditions averaged 23° C temperature and 42% relative humidity. Mean particle size distribution measurements for the exposures indicated that the atmospheres were gas

SUMMARY

only, as expected, since there was no substantial difference between the test substance chambers and the air control chambers.

There was no effect of treatment on survival. All animals survived until the termination of the study. The test animals were generally unremarkable during the exposure periods (in-chamber) and during the non-exposure periods. There were no exposure-related differences in body weights or weight changes or feed consumption (except the 12000 ppm exposed male animals showed an exposure-related 25% decrease in weight gain during the 1st week of exposures and this difference persisted for the remainder of the 4 weeks of exposures) in the test substance exposed animals compared to the air control animals. There was no apparent exposure-related effect on functional observational battery or motor activity parameters for either sex in this study. There were no exposure-related differences in hematology or coagulation or clinical chemistry values in test substance exposed animals compared to the air control animals at the terminal interval. There were no exposure-related differences in macroscopic or microscopic postmortem evaluations or organ weights in the test substance exposed animals compared to the air control animals.

Almost all mated female animals were found pregnant and delivered live pups. Mating indices for the male rats treated with the test substance were comparable to the air control group. Mating, fertility and gestation indices for the female rats treated with the test substance were comparable to the air control group. Almost all of the females in each group mated at the first opportunity. There were also no treatment-related differences in the other reproductive/developmental parameters up to the time of parturition including the percent of females completing delivery and the duration of gestation, when compared to the air control group. There were no exposure-related differences in any of the parturition parameters including pre-implantation loss, post-implantation loss, the total number of pups delivered, the number of pups dying, the viability (4 day survival) index, the pup sex ratio and the number of live pups/litter, when compared to the air control group. There were no exposure-related differences in body weights or weight gains in the pups feeding from females exposed to test substance during gestation, compared to the pups feeding from air control animals. There were no exposure-related differences in macroscopic postmortem evaluations in the pups feeding from females exposed to test substance during gestation compared to the pups feeding from air control animals.

In conclusion, exposure of male and female rats to target concentrations of 1200, 4000 or 12000 ppm of propane by whole-body inhalation for 4-6 weeks resulted in no general systemic/neurotoxic effects, apart from a reduction of body weight gain in the males resulting from the exposures at 12000 ppm. An overall no-observed-adverse effect level (NOAEL) of 4000 ppm was determined for general systemic/neurotoxic endpoints in this study. There were no effects on fertility or reproductive/developmental endpoints, including offspring survival and weight development up to post-natal day 4. A no-observed-adverse effect level (NOAEL) of 12000 ppm was determined for fertility and reproductive/developmental endpoints in this study.

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1. INTRODUCTION

This study was designed to screen the potential toxicity, including neurotoxicity and reproductive performance in male and female rats when propane, an industrial gas, was administered by whole-body inhalation exposure. It also was designed to permit detection of effects in both sexes on mating behavior and on gonadal function that may not be evident from histological examination of the reproductive organs. In addition, for female rats this study can detect effects on conception, development of the conceptus and parturition and pup survival to lactation day 4.

2. MATERIALS AND METHODS

2.1. STUDY MANAGEMENT

2.1.1. SPONSOR

American Petroleum Institute (API)
1220 L Street, Northwest
Washington, D.C. 20005-4070

2.1.2. SPONSOR REPRESENTATIVE

[redacted]

2.1.3. TESTING FACILITY

Huntingdon Life Sciences (HLS)
100 Mettlers Road
East Millstone, New Jersey 08875-2360

2.1.4. STUDY DIRECTOR

[redacted]

2.2. STUDY DATES

2.2.1. STUDY INITIATION

15 December 2003 (date study director signed the protocol)

2.2.2. DATE OF ANIMAL RECEIPT

6 January 2004 (experimental start date, per OECD GLP's)

2.2.3. EXPOSURE INITIATION

19 January 2004 (experimental start date, per EPA GLP's)

2.2.4. MATING INITIATION

2 February 2004

2.2.5. MATING TERMINATION

16 February 2004

2.2.6. EXPOSURE TERMINATIONS

17 February 2004 (main study)
6 March 2004 (satellite study)

2.2.7. TERMINAL SACRIFICE

17-18 February 2004 (main study)
28 February–13 March 2004 (satellite study)

2.2.8. EXPERIMENTAL TERMINATION

14 April 2010 (date of last data collection = date final report is signed by the pathologist)

2.2.9. STUDY COMPLETION

23 April 2010 (date final report is signed by the study director)

2.3. EXPERIMENTAL OUTLINE

Group	Group Designation	Exposure Levels (ppm)	Treatment Schedule Pre-mating Period		Number of Animals	
			Main Study Male Rats[b]	Main Study and Satellite Female Rats[b,c]	Main Study Male Rats	Main Study and Satellite Female Rats*
1	Air Control[a]	0	2 weeks	2 weeks	12	24
2	Low	1200	2 weeks	2 weeks	12	24
3	Mid	4000	2 weeks	2 weeks	12	24
4	High	12000	2 weeks	2 weeks	12	24

*12/group = main study animals for subchronic evaluations only

*12/group = satellite animals for reproductive/developmental evaluations only

[a]Control animals were treated with air only with the same treatment regimen as the treated groups.

[b]Main study male rats (12/group) were exposed once daily (6 hours/day), 7 days/week for 2 weeks prior to mating initiation. Exposure of main study male rats continued during the mating and post-mating periods for a minimum exposure of 28 days. Main study female rats (12/group) were exposed once daily (6 hours/day), 7 days/week for 4 weeks for a minimum exposure of 28 days.

[c]Satellite female rats (12/group) for the reproductive/developmental study were exposed once daily (6 hours/day), seven days/week for at least two weeks prior to mating initiation. Satellite female rats continued to be treated once daily (6 hours/day) during mating. Once mated, satellite female rats were treated once daily (6 hours/day) during gestation (days 0-19). Satellite female rats without evidence of mating continued to be treated for 19 days (6 hours/day) following completion of the mating period and then held for an additional 7 days.

The first day of exposures was defined as day 0 of the study.

2.4. JUSTIFICATIONS

2.4.1. ROUTE, DURATION AND FREQUENCY OF ADMINISTRATION

The inhalation route is one of the potential routes of human exposure to this test substance and was the route specified in the referenced guidelines. The duration of the study and frequency of exposures were as recommended in the referenced guidelines.

2.4.2. EXPOSURE LEVEL SELECTION

The exposure levels were based on results of a 2-week range-finding study (HLS Study No. 03-6146, See Appendix LL, range finding study), which showed no toxicity at exposure levels of 120, 1200 and 12000 ppm. Therefore, the high exposure level was established (for safety reasons) at 12000 ppm since it was 50% of the lower explosion limit (2.4% = 24000 ppm) for the test substance.

2.4.3. TEST ANIMAL SELECTION

The rat is a rodent animal model acceptable under OECD and EPA testing guidelines for reproductive/developmental toxicity and neurotoxicity studies. In addition, a historical database is available in the testing facility for comparative evaluation with this strain of rat.

2.4.4. NUMBER OF ANIMALS

The number of animals in this study was considered the minimum necessary to allow for meaningful interpretation of the data, as required by OECD and EPA guidelines. Ten pregnancies per group were considered an adequate number for screening for developmental toxicities. The reference guideline indicates 8-10 litters per group provide the necessary degree of consistency between studies. With the group size of 12 used in this study, and with recent pregnancy rates of 80-90%, this was anticipated to provide between 8-10 litters/group for evaluation. On this basis, group sizes of 12 paired main study male and satellite female rats were considered appropriate for this study and provided a sufficient number of litters in each group to meet guideline

requirements. Group sizes of 12 main study female rats were considered appropriate for providing comparable data to the main study male rats.

2.5. TEST SUBSTANCE

Propane

2.5.1. TEST SUBSTANCE CATEGORY

Industrial gas

2.5.2. SUPPLIER

MG Industries
3 Great Valley Parkway
Malvern, Pennsylvania 19355

2.5.3. LOT NUMBER

Not available

2.5.4. PURITY AND STABILITY

99.5% per supplier. The testing facility also determined the purity and stability by assaying by gas chromatography (GC) before and after the study (see Appendix JJ).

2.5.5. DESCRIPTION

Colorless gas

2.5.6. DATE RECEIVED

6 May 2003

2.5.7. EXPIRATION DATE

Not available, stable per MSDS and per stability assessment performed as part of this study (see Appendix JJ).

2.5.8. ANALYSIS

Documentation of the identity, strength, composition, stability and method of synthesis, fabrication and/or derivation of the batch of the test substance and the maintenance of these records was the responsibility of the supplier. Documentation of the identity, strength, composition and stability were also confirmed by the testing facility.

Note that the actual location for the synthesis of the test substance has not been provided by the supplier.

2.5.9. STORAGE

Ambient (in an outside solvent shed) when not in use in the inhalation laboratory.

2.5.10. ARCHIVAL SAMPLE

An archival sample from the lot of test substance was taken and stored in the archives of the sponsor (EPL Archives, Inc., 45610 Terminal Drive, Sterling, Virginia 20166). One cylinder (a common archival for this and the preceding range-finding study) was initially shipped to ChevronTexaco on 13 August 2003 and then was delivered to EPL archives for storage.

2.5.11. DISPOSITION

The unused portion of the test substance as well as any empty test substance containers will be returned to the supplier following submission of the final report with this test substance.

2.6. TEST ANIMALS

2.6.1. SPECIES

Albino Rats (Outbred) VAF/Plus®
Sprague-Dawley Derived (CD®)
Crl:CD® (SD) IGS BR

2.6.2. SUPPLIER

Charles River Laboratories
Raleigh, North Carolina 27610

2.6.3. NUMBER OF ANIMALS

Received:
159 total (53 males, 106 females)

Placed on test:
144 total (48 males, 96 females)

Females were nulliparous and non-pregnant. Male and female rats originated from the same room at the supplier.

2.6.4. AGE AT RECEIPT

Approximately 6 weeks

2.6.5. AGE AT INITIATION OF EXPOSURES

Approximately 8 weeks

2.6.6. WEIGHT AT INITIATION OF EXPOSURES (GRAMS)

	Mean	**Range**
Male:	269	243 - 297
Female (Main study and satellite):	200	180 - 220

Individual weights of animals placed on test were within ±20% of the mean weight for each sex.

2.6.7. ACCLIMATION PERIOD

Animals were acclimated for approximately 2 weeks. All animals were checked for viability twice daily. Prior to assignment to study, all animals were examined to ascertain suitability for study.

2.7. ANIMAL ASSIGNMENT

More animals than required for the study were purchased and acclimated. Animals considered suitable for study on the basis of pretest physical examinations and body weight data were randomly assigned by sex, to

control or treated groups by a computerized random sort program, in an attempt to equalize mean group body weights. Female animals were randomly assigned to 4 main/satellite study groups (12/group) and the male animals (12/group) to 4 main study groups. Disposition of all animals not utilized in the study is maintained in the study file.

2.8. ANIMAL IDENTIFICATION

Each animal was assigned a temporary identification number upon receipt, and after selection for the study, each animal was ear-tagged with a number assigned by the testing facility. If the tag was lost, it was replaced. The assigned animal number plus the study number comprised the unique animal number for each animal. In addition, each cage was provided with a cage card, which was color-coded for exposure level identification and contained study number and animal number information.

2.9. VETERINARY CARE

Animals were monitored by the technical staff for any conditions requiring possible veterinary care.

2.10. ANIMAL HUSBANDRY DURING NON-EXPOSURE PERIODS

2.10.1. FACILITIES MANAGEMENT/ANIMAL HUSBANDRY

Currently acceptable practices of good animal husbandry were followed e.g., *Guide for the Care and Use of Laboratory Animals*; National Academy Press, 1996. Huntingdon Life Sciences, East Millstone, New Jersey is fully accredited by the Association for Assessment and Accreditation of Laboratory Animal Care International (AAALAC).

2.10.2. HOUSING

Animals were housed individually in stainless-steel suspended cages with wire mesh floors and fronts, except for the mating period when one main study male and one satellite female rat were housed together. During cohabitation (when satellite female rats were brought to the main study male rat's cages), male and female rats were housed in stainless steel cages of appropriate size for group housing animals. Each cage was fitted to secure a glass

feeder jar with a stainless steel lid. From gestation day 18 and during lactation, the dam was housed with her litter in plastic "shoebox" cages with bedding.

2.10.3. FEED

Certified Rodent Diet, No. 5002; (Meal) (PMI Nutrition International, St. Louis, Missouri) was available without restriction. Fresh feed was presented weekly. During periods that feed consumption was not recorded, fresh feed was presented at least weekly.

2.10.4. FEED ANALYSIS

Analysis of each feed lot used during this study was performed by the manufacturer. Results can be found in Appendix OO. There were no known contaminants in the feed, which were expected to interfere with the results of this study.

2.10.5. WATER

Water (Elizabethtown Water Company, Westfield, New Jersey) was available without restriction via an automated watering system except during exposure periods.

2.10.6. WATER ANALYSIS

Water analyses are conducted by Elizabethtown Water Company, Westfield, New Jersey (Raritan-Millstone Plant) to ensure that water meets standards specified under the EPA Federal Safe Drinking Water Act Regulations (40 CFR Part 141). In addition, water samples are collected biannually from representative rooms in the testing facility; chemical and microbiological water analyses are conducted on these samples by a subcontract laboratory. Results of all water analyses can be found in Appendix OO. There were no known contaminants in the water that were expected to interfere with the results of this study.

2.10.7. BEDDING SUBSTANCE

Ground corncob bedding (Bed-O'-Cobs® ¼ inch irradiated, The Andersons, Maumee, Ohio) was provided for each mated female

rat on day 18 of gestation. Fresh bedding was provided weekly or as needed throughout lactation.

2.10.8. BEDDING ANALYSIS

Analyses for each batch of bedding used on study can be found in Appendix OO. There were no known contaminants in the bedding that were expected to interfere with the results of this study.

2.10.9. ENVIRONMENTAL CONDITIONS

Light/Dark Cycle

A twelve-hour light/dark cycle controlled via an automatic timer was provided.

Temperature

Temperature was monitored in accordance with testing facility SOPs and maintained within the specified range to the maximum extent possible.

Desired Range:	18 to 26°C
Actual Range:	20.1 to 25.7°C
Daily Average Range:	21.2 to 23.6°C

Relative Humidity

Relative humidity was monitored in accordance with testing facility SOPs and maintained within the specified range to the maximum extent possible. Excursions outside the specified range were not considered to have affected the integrity of the study.

Desired Range:	30 to 70%
Actual Range:	28.22 to 92.93% (2 days below 30% and 20 days above 70%)
Daily Average Range:	42.84 to70.06 %

2.11. TEST SUBSTANCE ADMINISTRATION AND CHAMBER OPERATION

See Appendix II, Inhalation Report.

2.12. MATING PROCEDURE

Within each treatment group, the main study male and satellite female rats were co-housed continuously (1:1) until evidence of mating was seen, or for 2 consecutive weeks. Satellite female rats were observed at approximately the same time each morning for the presence of a vaginal plug or sperm in the vaginal smear. If not mated, the stage of the estrous cycle was recorded instead. The day on which evidence of mating was observed was defined as day 0 of gestation. Once mated, the satellite female rats were removed from the mating cages and housed individually for the remainder of the study. After the mating period was over, satellite female rats without evidence of copulation were removed from the mating cages and housed individually for the remainder of the study (26 days) and monitored for visible signs of pregnancy with corresponding body weight gain.

2.13. EXPERIMENTAL EVALUATIONS

2.13.1. VIABILITY EXAMINATION (CAGESIDE)

Observations for mortality and general condition were made at least twice daily (once in the morning and once in the afternoon).

2.13.2. DETAILED PHYSICAL EXAMINATIONS

Each animal was removed from its cage and a detailed physical observation performed prior to randomization. Main study male rats were observed once weekly beginning during the pre-mating period and throughout the study. Main study female rats were observed weekly after randomization and throughout the study. Satellite female rats were observed weekly during the pre-mating period and on gestation days 0, 7, 14, 20 and lactation days 0 (except if parturition didn't complete on the same day as it initiated), 1 and 4. Satellite female rats without evidence of mating continued to be observed weekly during the mating and post-mating period until euthanized.

All animals were observed as a group at least once during each exposure. This was routinely performed near the middle of each exposure.

Examinations during non-exposure periods included observations of general condition, skin and fur, eyes, nose, oral cavity, abdomen and external genitalia, occurrence of secretions and excretions, and autonomic activity (e.g., lacrimation, piloerection, pupil size, unusual respiratory pattern). Changes in gait, posture and response to handling as well as the presence of clonic or tonic movements, stereotypy (e.g., excessive grooming, repetitive circling) or bizarre behavior (e.g., self-mutilation, walking backward) were recorded.

2.13.3. BODY WEIGHT

Body weights of the main study male and female rats were recorded at the time of randomization into test groups, on the first day of treatment and weekly thereafter throughout the study. Satellite female rats for the reproduction study were weighed at the time of randomization into test groups, on the first day of treatment and twice weekly until evidence of copulation was observed. Mated satellite female rats were weighed on gestation days 0, 7, 14 and 20 and Satellite female rats that delivered litters were weighed on lactation days 1 and 4. Satellite female rats without evidence of mating were weighed twice weekly during the mating and post-mating period. Terminal body weights for main study animals were recorded after fasting. Satellite females were not fasted prior to recording of terminal body weights.

2.13.4. FEED CONSUMPTION

Feed consumption for the main study male rats was recorded pretest and weekly during the pre-mating treatment period. Feed consumption for the main study female rats was recorded pretest and weekly during the treatment period. Feed consumption for satellite female rats was recorded pretest and weekly during the pre-mating period, and if not mated, during the post-mating period. Feed consumption was not recorded during the mating period when main study male rats were co-housed with satellite female rats. For pregnant or confirmed mated satellite female rats, feed consumption was recorded on gestation days 0-7, 7-14 and 14-20 and on lactation days 1-4.

Feed was available without restriction, except during exposures and at terminal fasting for the main study animals. Animals were

presented with full feeders of known weight. After 7 days (pre-mating), 6 or 7 days (gestation) or 3 days (lactation), the feeders were reweighed and the resulting weight subtracted from the initial feeder weight to obtain the grams of feed consumed per animal over the 7, 6 or 3-day period. Feed consumption was measured (weighed) weekly, beginning one week prior to treatment.

Calculation

Feed Consumption (g/kg/day) =

$$\frac{\text{grams of feed consumed}}{\text{body weight (kg)}^{a}} \div 7, 6 \text{ or } 3 \text{ days}$$

[a]The average of the current and first weight of the week was used.

2.13.5. PARTURITION AND LACTATION

On day 18 of gestation, several days prior to expected parturition, Satellite female rats were transferred to solid, plastic cages with bedding article provided. Thereafter, examinations for signs of parturition were made twice daily (morning and afternoon). The duration of gestation was documented. When parturition began on one day and ended the next, the lactation day 0 observations were actually recorded on lactation day 1, after all pups had been delivered. The day on which parturition initiated was defined as lactation day 0. Litters were observed as soon as possible after parturition completion for the number of live and dead pups, pup abnormalities and each pup was sexed. Thereafter, litters were observed twice daily (morning and afternoon). All pups in the litter were uniquely identified by toe tattoo after parturition completion. The presence of dead pups was recorded, and these were removed from the litter as found. Any unusual behaviors/observations and absence of milk in the stomach were noted.

2.13.6. F_1 PUP EVALUATIONS

Physical Examinations

Each F_1 pup was given a gross examination on lactation days 0 and 4. Pups were also observed for any abnormal behavior.

Body Weight

Individual F_1 pup weights were recorded on lactation days 1 and 4.

Sexing

Pups were sexed on lactation day 0 and sex verified on lactation day 4.

Where parturition occurred over a two day period, these evaluations were performed on lactation day 1 after all pups had been delivered (lactation day 0 being defined as the day that parturition initiated).

2.14. NEUROBEHAVIORAL EXAMINATIONS

Observations on all main study male and female rats from all exposure groups were recorded as outlined below. Observations were assessed during the last week of exposure. Animals were not exposed on the day of evaluations. Testing was staggered over several sessions. Each session consisted of approximately equal numbers of animals per sex per exposure level. Noise level was maintained within a level of 55 to 65 decibels by a white noise generator. Temperature, humidity and illumination were measured and recorded to ensure that variations in environmental conditions were minimal during all evaluations. The functional observational battery was performed for all animals before evaluation of motor activity. Positive control data demonstrating the sensitivity of the procedure is documented in Appendix KK.

2.14.1. FUNCTIONAL OBSERVATIONAL BATTERY

The time of testing was balanced across treatment groups. All observations during the treatment period were performed blind, i.e., the observer was unaware of the animals' treatment. The following evaluations were performed as part of the functional observational battery:

Sensory Observations
- startle response to auditory stimuli
- tail pinch response

Neuromuscular Observations
grip strength – hindlimb and forelimb

Physiological Observations
rectal temperature

Temperature

Temperature was monitored and recorded twice daily, just prior to the first evaluation and just after the last evaluation.

Desired: 18 to 26°C
Actual: 18 to 22°C

Relative Humidity

Relative humidity was monitored and recorded twice daily, just prior to the first evaluation and just after the last evaluation. Excursions outside the specified range were considered not to have affected the integrity of the study.

Desired: 30 to 70%
Actual: 28 to 59%

Noise Level

Noise level was monitored using a Digital Sound Level Meter, Model 840029 (Sper Scientific, Ltd., Scottsdale, Arizona) and recorded twice daily, just prior to the first evaluation and just after the last evaluation.

Desired: 55 to 65 dB
Actual: 60.1 to 64.0 dB

Illumination

Illumination was monitored using a Photometer 1 (Quantum Instruments, Inc., Garden City, New York) and recorded twice daily, just prior to the first evaluation and just after the last evaluation.

Desired: <80 footcandles
Actual: 39.8 to 48.1 footcandles

2.14.2. MOTOR ACTIVITY

Activity was monitored using an automated Photobeam Activity System (San Diego Instruments, Inc.) Sessions were 60 minutes in length; each session was divided into 12 five-minute intervals. The time of testing was balanced across treatment groups.

Temperature

Temperature was monitored and recorded twice daily, just prior to the first evaluation and just after the last evaluation.

Desired: 18 to 26°C
Actual: 18 to 22°C

Relative Humidity

Relative humidity was monitored and recorded twice daily, just prior to the first evaluation and just after the last evaluation.

Desired: 30 to 70%
Actual: 30 to 56%

Noise Level

Noise level was monitored using a Digital Sound Level Meter, Model 840029 (Sper Scientific, Ltd., Scottsdale, Arizona) and recorded twice daily, just prior to the first evaluation and just after the last evaluation.

Desired: 55 to 65 dB
Actual: 60.0 to 62.0 dB

Illumination

Illumination was monitored using a Photometer 1 (Quantum Instruments, Inc., Garden City, New York) and recorded twice daily, just prior to the first evaluation and just after the last evaluation.

Desired:	<80 footcandles
Actual:	44.6 to 52.9 footcandles

2.15. CLINICAL PATHOLOGY

Clinical pathology procedures and parameters were based on those recommended in published guidelines (Joint Scientific Committee, 1996).

Blood samples for hematology, coagulation and clinical chemistry studies were obtained from lightly anesthetized (CO_2/O_2) main study animals (12/sex/group) via puncture of the orbital sinus (retrobulbar) at study termination. Animals were fasted overnight prior to blood collection.

Blood was collected and studies performed as follows:

2.15.1. HEMATOLOGY

Blood for hematology studies was collected (approximately 0.25 mL) into tubes containing EDTA anticoagulant.

Blood samples were analyzed as follows:

ADVIA 120 HematologyAnalyzer, Bayer Corporation.

Hemoglobin concentration
Hematocrit
Erythrocyte count
Platelet count
Mean corpuscular volume
Mean corpuscular hemoglobin
Mean corpuscular hemoglobin concentration
Total leukocyte count
Reticulocyte count

Differential leukocyte count[1]

Other

Erythrocyte and platelet morphology (from peripheral blood smear) *(Henry, 1991)*

2.15.2. COAGULATION

Blood for coagulation studies was collected (approximately 0.75 mL) into tubes containing sodium citrate anticoagulant.

Blood samples were analyzed as follows:

Mechanical clot detection system, STA Compact®, Diagnostica Stago Products

Prothrombin time
Activated partial thromboplastin time

2.15.3. CLINICAL CHEMISTRY

Blood for clinical chemistry studies (approximately 1.0 mL) was collected into tubes with no anticoagulant, allowed to clot, and centrifuged to obtain serum.

Blood samples were analyzed as follows:

Hitachi 717, Roche Corporation Automatic Analyzer

Aspartate aminotransferase (*Kinetic - Modified IFCC Technique*)
Alanine aminotransferase (*Kinetic - Modified IFCC Technique*)
Alkaline phosphatase (*Kinetic – Modified AMP Buffer*)
Blood urea nitrogen (*Kinetic - Modified Urease*)
Creatinine (*Kinetic – Modified Jaffe Method*)
Glucose (*Hexokinase Method*)
Cholesterol (*Enzymatic – Modified Trinder Method*)

[1]When questionable values were obtained, manual differential leukocyte counts (Henry, 1991) and absolute value calculations were performed for verification.

Total protein (*Biuret Technique*)
Triglycerides (*GPO Triglyceride-lipase Method*)
Albumin (*Bromocresol Green Method*)
Total bilirubin (*Modified Wahlefield et al.*)
Sodium (*Ion Selective Electrode*)
Potassium (*Ion Selective Electrode*)
Chloride (*Ion Selective Electrode*)
Calcium (*Cresolphthalein Complexone Method*)
Inorganic phosphorus (*Phosphomolybdate - UV Method*)
Gamma-glutamyl transpeptidase (*Kinetic – Modified Persijn and Vander Silk Method)*

Other

Globulin (*calculated value; total protein - albumin*)
Albumin/globulin ratio (*calculated value; albumin ÷ globulin*)

2.15.4. RETENTION/STORAGE OF SPECIMENS

Any remaining (frozen) serum, which may have limited storage stability, was stored for up to six months after completion of assays and then discarded. Peripheral blood smears were retained and archived with the study.

2.16. POSTMORTEM EVALUATIONS

2.16.1. METHOD OF EUTHANASIA

All animals (except lactation day 4 pups) were euthanized by exsanguination following an overexposure of carbon dioxide inhalation. Lactation day 4 pups were euthanized using an intraperitoneal injection of sodium pentobarbital.

2.16.2. EUTHANASIA SCHEDULE

Main Study Male and Female Rats

Main study male and female rats were euthanized after at least 28 days of exposure.

Satellite Female Rats in the Reproduction Study

Mated satellite female rats were euthanized on postpartum day 4. Satellite female rats in which evidence of mating was detected but failed to deliver were sacrificed 26 days after evidence of mating. Satellite female rats where no evidence of mating was detected and who failed to deliver were euthanized 26 days after the completion of the mating period. Satellite female rats with total litter loss were euthanized on postpartum day 4.

2.16.3. MACROSCOPIC EXAMINATION – MAIN STUDY MALE RATS

Macroscopic postmortem examinations were performed on all main study male rats. Postmortem examinations included examination of external surface, all orifices, cranial cavity, nasal cavity (external examination), neck and its associated tissues and organs, thoracic, abdominal and pelvic cavities and their associated tissues and organs, and external surfaces of the brain.

2.16.4. MACROSCOPIC EXAMINATIONS – FEMALE RATS

Macroscopic postmortem examinations were performed on all Main study and satellite female rats. Postmortem examinations included examination of external surface, all orifices, cranial cavity, nasal cavity (external examination), neck and its associated tissues and organs, thoracic, abdominal and pelvic cavities and their associated tissues and organs, and external surfaces of the brain. The number of implantation sites and corpora lutea were recorded for each satellite female rat. The uteri of any apparently non-pregnant females were stained with ammonium sulphide (Salewski, 1964) to confirm non-pregnant status.

2.16.5. ORGAN WEIGHTS

Organs indicated in Table I (page 31) were taken at the scheduled necropsy, recorded and organ/body and organ/brain weight ratios calculated. Prior to weighing, all organs were carefully dissected and properly trimmed to remove fat and other contiguous tissue in a uniform manner. Organs were weighed as soon as possible after dissection to avoid drying. Paired reproductive organs were

weighed separately. All other paired organs were weighed together.

2.16.6. TISSUES PRESERVED AND EXAMINED HISTOLOGICALLY

The tissues listed in Table I (below) were obtained at necropsy for all main study male and female rats, as well as all satellite females. Slides of the indicated tissues were prepared and examined microscopically for control and high exposure main study animals. During the microscopic examination of the testes, special emphasis was placed on the stages of spermatogenesis and the histopathology of interstitial testicular cell structure. Any abnormalities not noted during macroscopic postmortem examinations, which were seen during histological processing were recorded.

TABLE I

ORGAN NAME	WEIGHED	PRESERVED Main and Satellite Study	EXAMINED MICROSCOPICALLY Main Study (Groups 1 and 4)
Adrenal glands	X	X	X
Bone (sternum/femur)[a]		X	X
Bone marrow (rib)		X	[b]
Brain (medulla/pons, cerebrum and cerebellum)	X	X	X
Epididymides	X	X	X
Heart	X	X	X
Kidneys	X	X	X
Large intestine (cecum, colon and rectum)		X	X
Larynx		X	
Liver	X	X	X
Lungs (with mainstem bronchi)	X	X	X
Lymph node (mesenteric)		X	X
Lymph node (mediastinal)		X	X
Mammary glands (with adjacent skin)		X	X

ORGAN NAME	WEIGHED	PRESERVED Main and Satellite Study	EXAMINED MICROSCOPICALLY Main Study (Groups 1 and 4)
Nasopharynx		X	
Ovaries (with oviducts)	X	X	X
Prostate		X	X
Seminal vesicles		X	X
Small intestine (duodenum, ileum and jejunum)		X	X
Spinal cord (cervical, thoracic and lumbar)		X	X
Spleen	X	X	X
Stomach		X	X
Testes	X	X	X
Thymus	X	X	X
Thyroid with parathyroids		X	X
Tibial nerve		X	X
Trachea		X	X
Urinary bladder		X	X
Uterus with vagina	X	X	X
All macroscopic lesions and tissue masses		X	X

[a]Qualitative examination (no differential count).

[b]Bone marrow smears were prepared but not examined.

Preservatives

All tissues - 10% neutral buffered formalin (NBF).
Testes and epididymides were placed in Modified Davidson's solution for at least 24 hours and then retained in NBF. Lungs and urinary bladder were infused with NBF for optimal preservation.

Smear preparations of the marrow from the rib were air dried and fixed in absolute methanol.

Processing

After fixation, the tissues and organs from Groups 1 and 4 main study animals were routinely processed, embedded in paraffin, cut at a microtome setting of 4-7 microns, mounted on glass slides and stained with hematoxylin and eosin.

2.16.7. MACROSCOPIC POSTMORTEM EXAMINATION - F_1 PUPS

Macroscopic postmortem examinations (internal and external) were performed on all F_1 pups found dead during lactation.

All F_1 pups found dead at birth were initially identified as stillborn. Unless prevented by an extreme autolytic or cannibalized condition, a lung floatation test was used to reclassify pups as stillborn or alive but found dead. Pups that could not be tested remained classified as stillborn.

Macroscopic postmortem examinations (external only) were performed on all F_1 pups on lactation day 4 for pups surviving to that interval. Unusual observations, including gross abnormalities and the absence of milk in the stomach, were noted and then the carcasses discarded.

2.17. STATISTICAL ANALYSIS

2.17.1. CONTINUOUS DATA

The following parameters were analyzed statistically:

Body weights
Body weight changes
Feed consumption values
Rectal temperature
Grip strength measurements
Hematology
Coagulation
Clinical chemistry
Gestation length
Corpora lutea and implantation sites, pre and post implantation loss

F_1 pup weights (each weighing interval during lactation)
Number of pups (F_1 litters) per pregnant female rats
Number of male and females pups
Pup weight distinguished by sex and as a composite for both sexes (litter as experimental unit)
Organ weights
Organ weight to body weight ratios
Organ weight to brain weight ratios

Method of Analysis

Mean values of all exposure groups were compared to the mean value for the control group at each time interval.

Evaluation of equality of group means was made by the appropriate statistical method, followed by a multiple comparison test if needed. Bartlett's test (Bartlett, 1937; Sokal and Rohlf, 1995) was performed to determine if groups had equal variances. For all FOB, clinical pathology and pre-implantation and post-implantation loss parameters, if the variances were equal, parametric procedures were used; if not, nonparametric procedures were used. All other data was analyzed only by parametric methods. The parametric method was the standard one-way analysis of variance (ANOVA) using the F ratio to assess significance (Armitage, 1971; Dunlap and Duffy, 1975). If significant differences among the means were indicated, additional tests were used to determine which means were significantly different from the control: Dunnett's (Dunlap et al., 1981; Dunnett, 1955, 1964), Williams (Williams, 1971, 1972), or Cochran and Cox's modified t-test (Cochran and Cox, 1959). The nonparametric method was the Kruskal-Wallis test (Kruskal and Wallis, 1952, 1953; Siegel, 1956) and if differences were indicated, Shirley's test (Shirley, 1977), Steel's test (Steel, 1959), or a Pairwise Comparison (Siegel, 1956) was used to determine which means differed from control. Bartlett's test for equality of variance was conducted at the 1% significance level; all other statistical tests were conducted at the 5% and 1% significance levels.

Exceptions

Statistical evaluations were not performed when the standard deviation for the control group was 0.

When 75% of the values for a clinical pathology parameter were the same, Fisher's Exact Test (Fisher, 1973) was performed followed by Mantel's test (Mantel, 1963).

2.17.2. MOTOR ACTIVITY COUNTS

The data were analyzed using split-plot repeated measures ANOVA with model terms for group, animal within group, interval and group by interval interaction. If the group by interval interaction was statistically significant (p=0.05), indicating non-parallelism in the behavioral profile between groups, a separate one-way ANOVA for group effects was performed at each interval. If the response data passes on the parallel hypothesis, an ANOVA (using summed responses over intervals) was used to test for the overall treatment effect, with respect to the level hypothesis. If any significant overall treatment group effect was found by any of the above ANOVAs, Dunnett's t-test was used to find groups that differed from control. Analyses were performed for sexes separately and combined. Treatment group effects were deemed significant at the p=0.05 level. Plots, tables, listings and analyses were generated using SAS® version 8.2 for WINDOWS. Analyses were conducted by CATO Research, 200 Westpark Corporate Center, 4364 South Alston Avenue, Durham, NC 27713-2280. The testing facility was responsible for the GLP compliance of this subcontractor.

2.17.3. INCIDENCE DATA

The following parameters were analyzed statistically:

Mortality rate
Mating indices, pregnancy rates, male fertility indices
Litter survival indices
Gestation indices
Incidence of dams with no viable pups
Mean pup survival indices (lactation days 0 and 4)

Incidence Data Analysis

A Fisher Exact Test with Bonferonni correction was performed to identify differences between the control and treatment groups (Siegel, 1956). All statistical tests were conducted at the 5% and 1%, two-sided risk levels.

2.18. DATA STORAGE

All raw data, preserved specimens and retained samples, as well as the original study protocol (and any amendments) and the original final report are to be maintained in the archives of the testing facility (including those generated by the statistical subcontractor) upon completion of the study. The sponsor will determine the final disposition of these materials.

2.19. REGULATORY REFERENCES

2.19.1. TEST GUIDELINE

This study complied with the Organization for Economic Cooperation and Development (March 22, 1996). OECD Guidelines for Testing of Chemicals; OECD Guideline 422: Combined Repeated Exposure Toxicity study with the Reproduction/Development Toxicity Screening Test, pp. 1-14 and US EPA OPPTS Health Effects Test Guidelines 870.3650, Combined Repeated Exposure Toxicity Study with the Reproduction/Development Toxicity Screening Test, July 2000.

2.19.2. GOOD LABORATORY PRACTICES

This study was conducted in compliance with EPA Good Laboratory Practices as set forth in 40 CFR Part 792 (TSCA) and Organization for Economic Cooperation and Development (OECD) Good Laboratory Practices as set forth in ENV/MC/CHEM(98)17 with the exception that a lot number for the test substance was not available.

2.19.3. ANIMAL WELFARE ACT COMPLIANCE

This study complied with all appropriate parts of the Animal Welfare Act regulations: 9 CFR Parts 1 and 2 Final Rules, Federal Register, Volume 54, No. 168, August 31, 1989, pp. 36112-36163,

effective October 30, 1989 and 9 CFR Part 3 Animal Welfare Standards; Final Rule, Federal Register, Volume 56, No. 32, February 15, 1991, pp. 6426-6505, effective March 18, 1991.

2.20. PROTOCOL DEVIATIONS

The following protocol deviations occurred during this study:

1. The supplier provided male and female animals from the same room at their facility which deviated from the protocol as this allowed the possibility of brother-sister matings.

2. Pup numbers 2, 5, 6, 7, 8, 9 and 10 from dam no. 4524 were examined according to protocol and SOP except they did not have the correct finding noted for lung floatation test (Y-found dead, N-stillborn). Therefore, the lung status of these pups at necropsy could not be determined. All of these pups were marked stillborn at the last in-life evaluations and were therefore reported as such.

3. Organ weights were recorded but not required by protocol for the satellite female No. 2513 who did not deliver pups.

3. RESULTS AND DISCUSSION

3.1. TEST SUBSTANCE ANALYSIS

(Appendix JJ)

Pre-study GC analysis of the test substance showed a purity of 99.91% for propane. This value compared closely to the purity of 99.84% for the analytical standard of propane and the 99.5% purity as guaranteed by the supplier of the test substance. Post-study GC analysis of the test substance showed a purity of 99.90% for propane. This value compared closely to the purity of 99.80% for the analytical standard of propane and essentially replicated the 99.91% pre-study purity demonstrating stability of the test substance over the period of this study.

3.2. CHAMBER MONITORING

(Appendix II)

Chamber distribution analyses showed that the test substance was evenly distributed within each chamber. Samples of air in the testing room showed no test substance before or during the study and that normal concentrations (21%) of O_2 were measured.

The target and mean (± standard deviation) analytical (IR) and nominal concentrations (based on gas flows) are summarized as follows:

Group	Test Substance	Target Concentration (ppm)	Analytical Concentration (ppm)	Nominal Concentration (ppm)
1	Air Control	0	0 ± 0	0 ± 0
2	Propane	1200	1230 ± 34	1253 ± 8
3	Propane	4000	3990 ± 156	3836 ± 123
4	Propane	12000	12168 ± 415	12266 ± 667

The analytically measured exposure levels of the airborne test substance were reasonably close, in the opinion of the study director, to the targeted exposure levels and nominal concentrations (based on gas flow rate and based on weight of test substance consumed). The nominal concentrations

by weight and by gas flow sometimes varied by as much as 20% but this was considered to be within acceptable experimental variation. Chamber environmental conditions averaged 23° C temperature and 42% relative humidity.

Mean particle size distribution measurements for the exposures are summarized as follows:

Group	Test Substance	Mass Median Aerodynamic Diameter (µm)	Geometric Standard Deviation	Total Mass Concentration (mg/m^3)
1	Air Control	2.273	1.994	3.53×10^{-3}
2	Propane	2.541	2.015	4.32×10^{-3}
3	Propane	4.061	1.981	9.96×10^{-3}
4	Propane	6.560	2.187	1.58×10^{-2}

These results indicated that the atmospheres were gas only, as expected, since there was no substantial difference (especially as regards the total mass concentration) between the test substance chambers and the air control chamber.

3.3. MAIN STUDY ANIMALS

3.3.1. MORTALITY

(Table 1; Appendix A)

There was no effect of treatment on survival. All animals survived until the termination of the study.

3.3.2. PHYSICAL OBSERVATION DATA

(Table 1; Appendices B and II)

The test animals were unremarkable during the exposure periods (in-chamber) and during the non-exposure periods (out-of-chamber). There was a low incidence of transient red staining between the 22nd and 28th days of exposure in all groups

including the control females but did not appear to be treatment-related.

3.3.3. BODY WEIGHTS

(Tables 2 and 3; Appendices C and D)

There were exposure-related differences in body weights and weight changes in the 12000 ppm exposed male animals as compared to the air control animals. These male animals showed a 25% decrease in weight gain during the 1st week of exposures and this difference persisted for the remainder of the 4 weeks of exposures. Similar differences were not seen at the lower levels for the males or in any of the female groups.

3.3.4. FEED CONSUMPTION

(Table 4; Appendix E)

There were no meaningful differences in feed consumption in the test substance exposed animals as compared to the air control animals.

3.3.5. NEUROBEHAVIORAL STUDIES

3.3.5.1. FUNCTIONAL OBSERVATIONAL BATTERY

(Table 5; Appendix F)

There was no meaningful effect on functional observational battery parameters for either sex in this study. A statistically significant increase in hindlimb grip strength was noted in the 4000 ppm exposed males but there was no exposure level related pattern.

3.3.5.2.MOTOR ACTIVITY

(Figures 1 and 2; Table 6; Appendix G)

There was no exposure-related effect on motor activity for either sex in this study.

3.3.6. CLINICAL PATHOLOGY

3.3.6.1. HEMATOLOGY

(Table 7; Appendix H)

There were no meaningful differences in hematology values in test substance exposed male animals as compared to the air control animals at termination. A statistically significant decrease (up to 21% in the low level) in absolute lymphocytes in the test substance exposed males was seen but not in an exposure-related pattern and there were no accompanying changes in the other hematology parameters for the males, nor were there any similar differences in the females. In isolation, these minor inter-group differences were not considered to indicate an effect of the exposures and were within this laboratory's normal range of values. Similarly, the statistically significant increases only in the 12000 ppm exposed females for hemoglobin concentration, hematocrit, erythrocytes and absolute eosinophils were considered in context too small to represent an effect of the exposures.

3.3.6.2. COAGULATION

(Table 8; Appendix I)

There were no exposure-related differences in coagulation values in test substance exposed animals as compared to the air control animals at termination.

3.3.6.3. CLINICAL CHEMISTRY

(Table 9; Appendix J)

There were no meaningful differences in clinical chemistry values in the test substance exposed animals as compared to the air control animals at termination. A statistically significant increase in sodium concentration in the 12000 ppm exposed females was seen but the absolute difference was less than 1% and there was no similar

difference in the males. A statistically significant decrease in chloride concentration in the 1200 ppm exposed females was seen but the absolute difference was only 2% and there was no similar difference at the higher levels in the females or at any level of exposure in the males. In isolation, these minor inter-group differences were not considered to indicate effects of the exposures and were within this laboratory's normal range of values.

3.3.7. ORGAN WEIGHTS

(Table 10; Appendix K)

There were no meaningful inter-group differences in organ weights in the test substance exposed animals as compared with air control animals. The 1200 and 12000 ppm exposed males showed decreases in kidney weights (absolute and/or relative to body or brain weight) but no similar differences were seen in the exposed females. The 12000 ppm exposed males also showed decreases in absolute (but not relative) liver weights and similar differences were seen (but only relative to brain weight) in the 4000 and 12000 ppm exposed females. Considering the absence of any correlated pathology findings (see below) and clear patterns of treatment, these minor inter-group differences were not considered to indicate effects of the exposures.

3.3.8. MACROSCOPIC POSTMORTEM EVALUATIONS

(Table 11; Appendix L)

There were no exposure-related differences in macroscopic postmortem evaluations in the test substance exposed animals as compared to the air control animals. A few minor findings (such as discoloration of the lungs and distension of the uterus, the latter probably associated with an estrus state) occurred sporadically but were not related to the exposure to the test substance. The firm pancreatic mass observed at necropsy in one control male rat was identified as originating from the liver and microscopically was an incidental infarct.

3.3.9. HISTOPATHOLOGICAL EVALUATIONS

(Table 12; Appendix L)

There were no exposure-related differences in microscopic postmortem evaluations in the 12000 ppm test substance exposed animals as compared to the air control animals. Microscopic findings generally occurred sporadically or at a similar incidence in control and test article treated animals and were of the type commonly seen as background findings in this age and strain of animal. They were therefore considered incidental findings unrelated to exposure to the test substance.

Compared with controls, a few findings occurred at a greater incidence in the 12000 ppm treated group; these included hemorrhage in the thymus of females, and perialveolar/perivascular subacute chronic cell infiltrate in the lungs of males. Hemorrhage in the thymus is a common agonal change, which is associated with the method of euthanasia and is unrelated to exposure to control or test article substances. The minimal inflammatory cell infiltrates surrounding blood vessels, which occurred at a slightly higher incidence in 12000 ppm treated males (but not females) are common background findings in untreated or vehicle treated animals. In the absence of any other evidence of lung changes and because similar incidences of this finding were present in control and test article treated females, the higher incidence in 12000 ppm males is considered incidental and unrelated to test article exposure.

The testes were examined qualitatively with an awareness of the stages of the spermatogenic cycle to detect any disturbances in spermatogenesis, and with emphasis on the interstitial (Leydig) cells to detect any changes in cellular size or structure:

Testes - Stages of Spermatogenesis: No abnormalities were evident in test substance exposed or air control rats.
Testicular Interstitial Cells: No abnormalities were observed in testicular interstitial cells in test substance exposed or air control rats.

3.4. SATELLITE STUDY FEMALE ANIMALS

3.4.1. MORTALITY AND PREGNANCY

(Table 13; Appendix M)

There was no effect of treatment on survival. All animals survived until the termination of the study. All mated female animals (except one in the 1200 ppm group) were found pregnant and delivered live pups.

3.4.2. PHYSICAL OBSERVATION DATA – PREMATING, MATING, GESTATION AND LACTATION PERIODS

(Tables 14, 15 and 16; Appendices N, O and P)

The test animals were unremarkable during the exposure periods (in-chamber) and during the non-exposure periods (out-of-chamber). There were only the usual low and sporadic incidences of findings that are common to this strain of rat: predominantly localized patchy alopecia or staining.

3.4.3. BODY WEIGHTS - PREMATING, MATING, GESTATION AND LACTATION PERIODS

(Tables 17 to 22; Appendices Q to V)

There were no exposure-related differences in body weights or weight changes in the test substance exposed animals as compared to the air control animals.

3.4.4. FEED CONSUMPTION – PREMATING, GESTATION AND LACTATION PERIODS

(Tables 23, 24 and 25; Appendices W, X and Y)

There were no exposure-related differences in feed consumption in the test substance exposed animals as compared to the air control animals.

3.4.5. MATING, FERTILITY AND GESTATION PARAMETERS

(Tables 26 and 27; Appendices Z and AA)

Mating and fertility indices for both sexes were unaffected by the exposures and all but two of the pairings in the study (both in the 1200 ppm group) mated at the first opportunity (first available estrus). These failed pairings, and the single female in the 1200 ppm group that did not become pregnant, were considered incidental occurrences. Similarly, there were no exposure-related inter-group differences for the delivery parameters, including the number of females successfully completing delivery, the duration of gestation and the proportion with live litters and/or with stillborn pups.

3.4.6. PARTURITION AND LITTER SURVIVAL DATA

(Table 27; Appendices BB and CC)

Parturition data for the female rats treated with the test substance were comparable to the air control group. There were no exposure-related differences in any of the parturition parameters including pre-implantation loss (as defined by the difference between the number of corpora lutea and the number of implantations detected in the uterus), post-implantation loss (as defined by the difference between the number of live pups born and the number of implantations, thus including any stillborn pups), the total number of pups delivered, the number of pups dying, the viability (4 day survival) index, the pup sex ratio and the number of live pups/litter, when compared to the air control group. Statistically significant decreases in the number of liveborn pups and converse increases in the number of stillborn pups in the 4000 and 12000 ppm exposed groups were attributable to the single total litter loss in each of these groups very soon after parturition. These losses were preceded by decreased food consumption and severely reduced body weight gain in the last week of gestation for these particular dams (#3522 and #4524, respectively). Dams #3522 and #4524 were reported as appearing to have difficulty obtaining water (improper use of the water valve). This may have been a contributing factor for the decreased food consumption and reduced body weight gains and total litter loss. There was no

excess of mortality in any of the other litters in these groups and the total litter losses were considered incidental and not related to the exposures.

3.4.7. MACROSCOPIC POSTMORTEM EVALUATIONS

(Table 28; Appendix DD)

There were no exposure-related differences in the incidence of macroscopic postmortem findings in the test substance exposed animals as compared to the air control animals. Incidental findings, including a liver with an extra lobe observed in both control and high dose animals and a urinary bladder calculus observed in control animals) were not considered related to treatment with the test substance.

3.4.8. ORGAN WEIGHTS

(Table 29; Appendix EE)

There were no exposure-related differences in organ weights in the test substance exposed animals as compared to the air control animals.

3.5. PUP DATA

3.5.1. PHYSICAL OBSERVATION DATA

(Table 30; Appendix FF)

The pups were generally unremarkable during the early lactation period until termination at postnatal day 4.

3.5.2. BODY WEIGHT DATA

(Tables 31 and 32; Appendix GG)

There were no meaningful differences in body weights or weight gains, up to postnatal day 4, in the pups from test substance exposed animals as compared to the pups from air control animals.

3.5.3. MACROSCOPIC POSTMORTEM EVALUATIONS

(Table 33; Appendix HH)

There were no exposure-related differences in the incidence of macroscopic postmortem evaluations in the pups from test substance exposed animals as compared to the pups from air control animals. Scattered observations, such as no milk in stomach, were noted but were not considered exposure-related being associated mostly with the (incidental) total litter losses.

4. CONCLUSION

Exposure of male and female rats to target concentrations of 1200, 4000 or 12000 ppm of propane by whole-body inhalation for 4-6 weeks resulted in no general systemic/neurotoxic effects, apart from a reduction of body weight gain in the males resulting from the exposures at 12000 ppm. An overall no-observed-adverse effect level (NOAEL) of 4000 ppm was determined for general systemic/neurotoxic endpoints in this study. There were no effects on fertility or reproductive/developmental endpoints, including offspring survival and weight development up to post-natal day 4. A no-observed-adverse effect level (NOAEL) of 12000 ppm was determined for fertility and reproductive/developmental endpoints in this study.

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CALCULATIONS

Female Mating Index:

no. of females with confirmed mating (sperm and/or vaginal plug) plus no. of pregnant females without evidence of mating (no sperm or vaginal plug)/no. of females placed with males

Female Fertility Index:

no. of females pregnant/no. of females confirmed mating or pregnancy for females without evidence of mating

Male Mating Index:

no. of males with confirmed mating with a female or pregnancy for females without evidence of mating/no. of males placed with females

Male Fertility Index:

no. of males mating and impregnating a female plus the no. of males with a pregnant female without evidence of mating/no. of males with confirmed mating plus no. of males with a pregnant female without evidence of mating

Gestation Index:

no. of females with liveborn/no. of females with confirmed pregnancy

Viability Index:

no. of pups alive Day 4/no. of liveborn pups

Live Birth Index:

total no. of liveborn pups/total no. of pups born

Pregnancy Index:

total no. of females pregnant/total no. of females mated

CALCULATIONS

Pre-implantation Loss:

no. of corpora lutea – no. of implantation sites

Post-implantation Loss:

total no. of implantation sites – no. of live pups

	General Preface	

General Notes

Individual animal data values presented in this report may be rounded. Unrounded individual animal data values are used to calculate the reported mean and standard deviation values. Therefore, use of the reported individual values to reproduce means, standard deviations and/or to perform any subsequent calculations may produce minor discrepancies between the calculated values and those presented in this report.

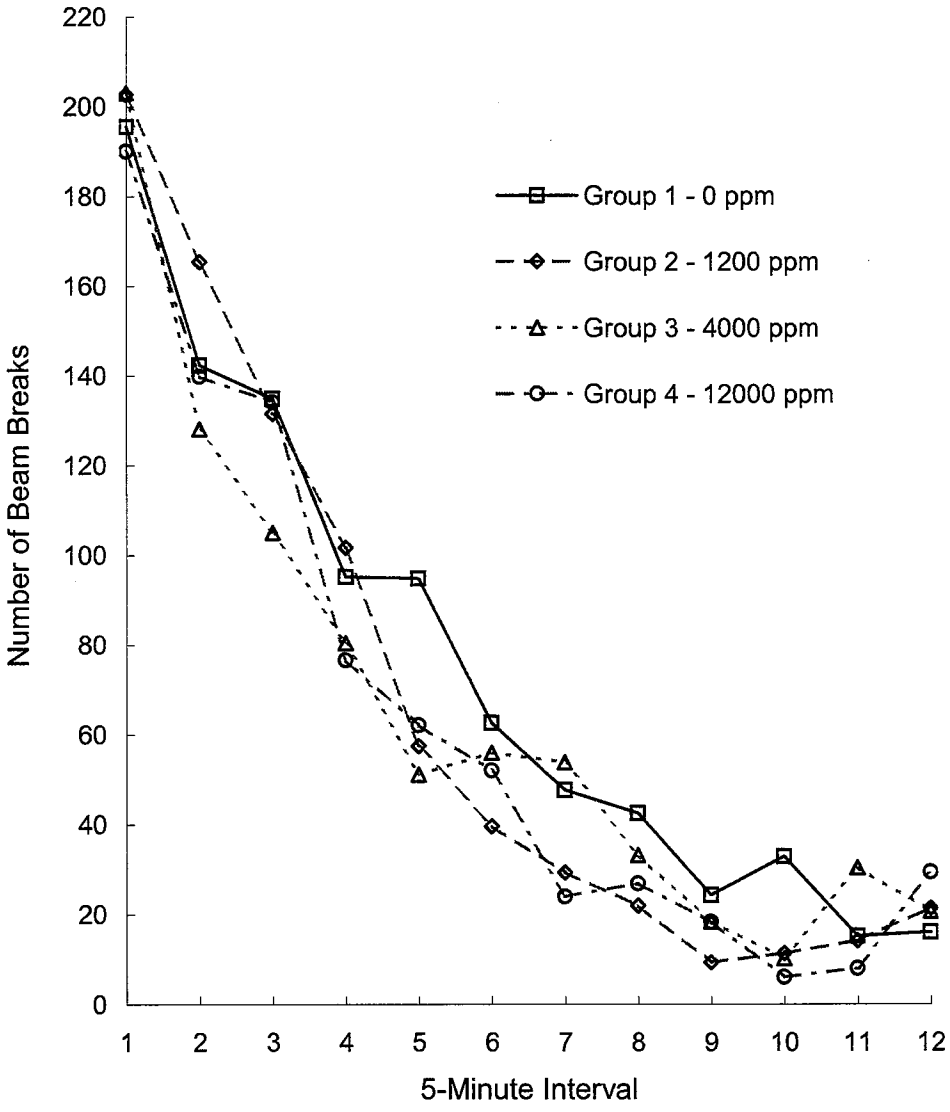
Key to Abbreviations

M	=	Male
F	=	Female
Gen.	=	General
PG	=	Pregnant
S	=	Satellite
03-4245S	=	Satellite Females

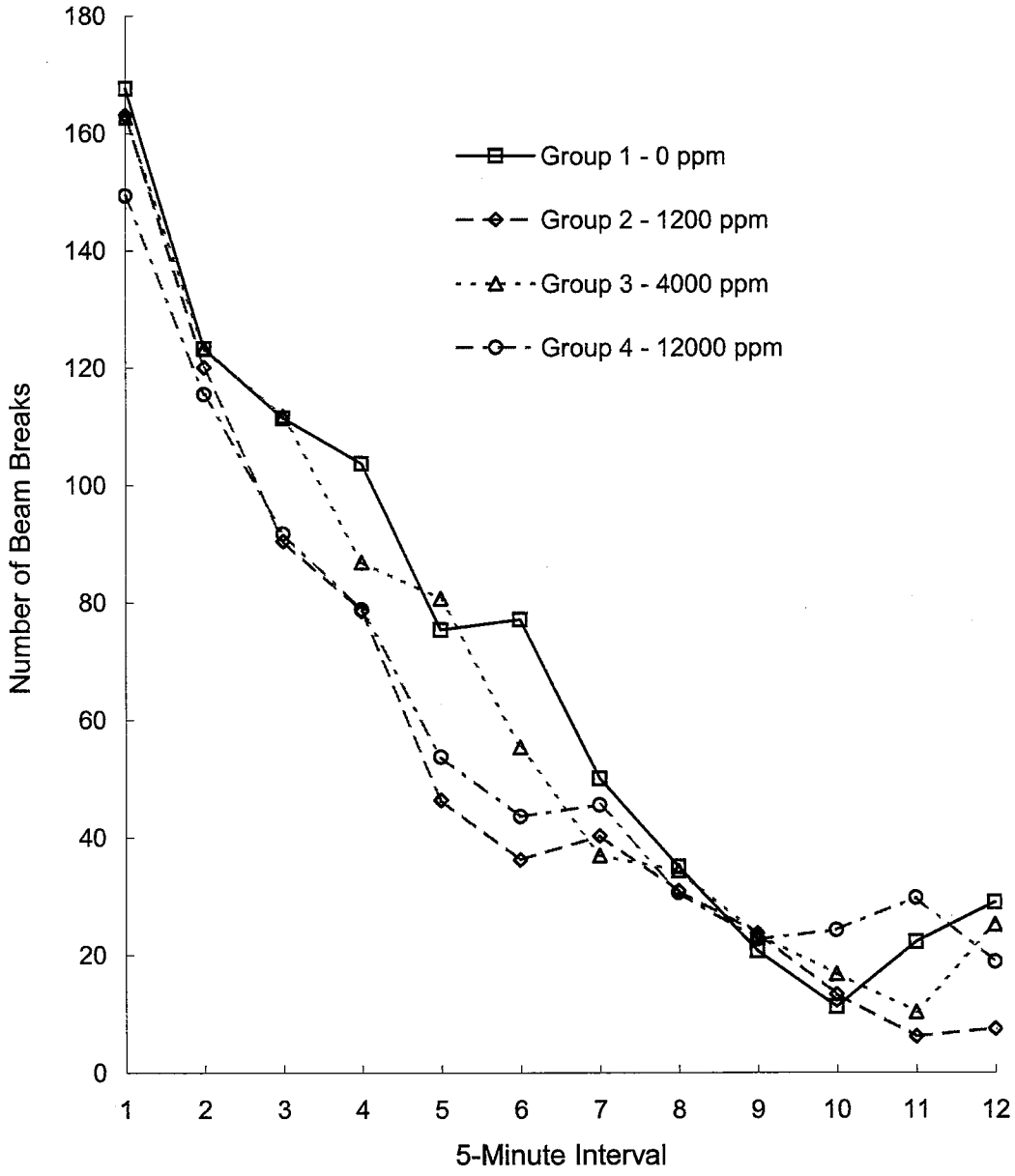
Notes

1. Days 0-14 – Pre-mating; Days 14-28 – Mating; After Day 28 – Post-mating
2. The study title was revised to "Propane: Combined Repeated-Exposure Toxicity with Reproduction/Developmental Toxicity and Neurotoxicity Screening in Rats via Whole-Body Inhalation Exposures" effective 16 November 2009. Only the cover page and summary of the report were revised to reflect this change since all other pages were computer generated based on the original study title.

Males	Mean Motor Activity Values 4th Week of Exposure	Figure 1



Females	Mean Motor Activity Values 4th Week of Exposure	Figure 2



	Summary of Clinical Observations Main Study Preface	Table 1

Number of animals examined represents the total number of animals observed and animals which were killed at a scheduled sacrifice for a given interval.

Total represents a cumulative total of all animals with the indicated observation one or more times during the study.

Corresponding exposure levels for each group were as follows:

Group 1 - 0 ppm
Group 2 - 1200 ppm
Group 3 - 4000 ppm
Group 4 - 12000 ppm

TABLE 1

PROPANE: COMBINED REPEATED-EXPOSURE TOXICITY, REPRODUCTION
AND NEUROTOXICITY SCREENING IN RATS VIA WHOLE-BODY
INHALATION EXPOSURES

MALES — SUMMARY OF CLINICAL OBSERVATIONS

		DAY OF STUDY								
	GROUP#	-7	0	8	15	22	28	29	30	TOTAL
# OF ANIMALS EXAMINED	I	12	12	12	12	12	12	6	6	
	II	12	12	12	12	12	12	6	6	
	III	12	12	12	12	12	12	6	6	
	IV	12	12	12	12	12	12	6	6	
Normal										
WITHIN NORMAL LIMITS	I	12	12	11	11	10	9	0	0	12
	II	12	12	12	11	11	9	0	0	12
	III	12	12	11	11	9	8	0	0	12
	IV	12	12	9	9	7	9	0	0	12
Dead										
TERMINAL SACRIFICE	I	0	0	0	0	0	0	6	6	12
	II	0	0	0	0	0	0	6	6	12
	III	0	0	0	0	0	0	6	6	12
	IV	0	0	0	0	0	0	6	6	12
Dermal-General										
ALOPECIA - EXTREMITIES/SNOUT	I	0	0	1	1	2	3	0	0	3
	II	0	0	0	0	1	1	0	0	1
	III	0	0	0	0	3	3	0	0	3
	IV	0	0	0	0	2	2	0	0	2
SCABS	I	0	0	0	0	0	0	0	0	0
	II	0	0	0	1	1	1	0	0	1
	III	0	0	0	0	0	0	0	0	0
	IV	0	0	0	0	0	0	0	0	0
RED STAINS - EXTREMITIES/SNOUT	I	0	0	0	0	0	0	0	0	0
	II	0	0	0	0	0	2	0	0	2
	III	0	0	0	0	1	1	0	0	2
	IV	0	0	0	0	3	1	0	0	4

Huntingdon Life Sciences 03-4245
MAIN STUDY

TABLE 1

PROPANE: COMBINED REPEATED-EXPOSURE TOXICITY, REPRODUCTION AND NEUROTOXICITY SCREENING IN RATS VIA WHOLE-BODY INHALATION EXPOSURES

MALES — SUMMARY OF CLINICAL OBSERVATIONS

		DAY OF STUDY								
	GROUP#	-7	0	8	15	22	28	29	30	TOTAL
# OF ANIMALS EXAMINED	I	12	12	12	12	12	12	6	6	
	II	12	12	12	12	12	12	6	6	
	III	12	12	12	12	12	12	6	6	
	IV	12	12	12	12	12	12	6	6	
Ocular										
CHROMODACRYORRHEA - BILATERAL	I	0	0	0	0	0	0	0	0	0
	II	0	0	0	0	0	0	0	0	0
	III	0	0	0	0	0	0	0	0	0
	IV	0	0	2	2	0	0	0	0	2
LACRIMATION - UNILATERAL	I	0	0	0	0	0	0	0	0	0
	II	0	0	0	0	0	0	0	0	0
	III	0	0	0	0	0	0	0	0	0
	IV	0	0	1	0	0	0	0	0	1
Oral/Buccal										
NASAL DISCHARGE - RED	I	0	0	0	0	0	0	0	0	0
	II	0	0	0	0	0	0	0	0	0
	III	0	0	1	1	0	0	0	0	1
	IV	0	0	0	1	0	0	0	0	1

TABLE 1

PROPANE: COMBINED REPEATED-EXPOSURE TOXICITY, REPRODUCTION AND NEUROTOXICITY SCREENING IN RATS VIA WHOLE-BODY INHALATION EXPOSURES

FEMALES — SUMMARY OF CLINICAL OBSERVATIONS

		DAY OF STUDY								
	GROUP#	-7	0	8	15	22	28	29	30	TOTAL
# OF ANIMALS EXAMINED	I	12	12	12	12	12	12	6	6	
	II	12	12	12	12	12	12	6	6	
	III	12	12	12	12	12	12	6	6	
	IV	12	12	12	12	12	12	6	6	
Normal										
WITHIN NORMAL LIMITS	I	12	12	12	12	8	10	0	0	12
	II	12	12	12	12	8	11	0	0	12
	III	12	12	12	12	10	10	0	0	12
	IV	12	12	12	12	7	9	0	0	12
Dead										
TERMINAL SACRIFICE	I	0	0	0	0	0	0	6	6	12
	II	0	0	0	0	0	0	6	6	12
	III	0	0	0	0	0	0	6	6	12
	IV	0	0	0	0	0	0	6	6	12
Dermal-General										
ALOPECIA - EXTREMITIES/SNOUT	I	0	0	0	0	2	2	0	0	2
	II	0	0	0	0	2	1	0	0	2
	III	0	0	0	0	0	0	0	0	0
	IV	0	0	0	0	2	2	0	0	2
RED STAINS - EXTREMITIES/SNOUT	I	0	0	0	0	3	0	0	0	3
	II	0	0	0	0	2	0	0	0	2
	III	0	0	0	0	2	2	0	0	3
	IV	0	0	0	0	4	1	0	0	4

TABLE 2

PROPANE: COMBINED REPEATED-EXPOSURE TOXICITY, REPRODUCTION AND NEUROTOXICITY SCREENING IN RATS VIA WHOLE-BODY INHALATION EXPOSURES

MALES — MEAN BODY WEIGHT VALUES (GRAMS)

	DOSE GROUP:	1	2	3	4
	DOSE LEVEL (PPM):	0	1200	4000	12000
DAY -7	MEAN	197	197	197	198
	S.D.	8.0	8.3	8.3	8.1
	N	12	12	12	12
DAY 0	MEAN	270	267	273	266
	S.D.	11.2	14.7	15.3	13.0
	N	12	12	12	12
DAY 7	MEAN	318	313	321	302
	S.D.	16.2	21.2	19.7	17.5
	N	12	12	12	12
DAY 14	MEAN	354	344	355	331
	S.D.	21.3	26.2	26.3	20.7
	N	12	12	12	12
DAY 21	MEAN	383	373	389	359
	S.D.	25.1	28.9	29.7	22.7
	N	12	12	12	12
DAY 28	MEAN	411	396	415	378*
	S.D.	27.8	32.4	37.4	24.3
	N	12	12	12	12

Statistical key: * = p<0.05

TABLE 2

PROPANE: COMBINED REPEATED-EXPOSURE TOXICITY, REPRODUCTION AND NEUROTOXICITY SCREENING IN RATS VIA WHOLE-BODY INHALATION EXPOSURES

FEMALES — MEAN BODY WEIGHT VALUES (GRAMS)

		DOSE GROUP:	1	2	3	4
		DOSE LEVEL (PPM):	0	1200	4000	12000
DAY	-7	MEAN	168	168	168	168
		S.D.	7.9	7.6	7.7	7.9
		N	12	12	12	12
DAY	0	MEAN	204	199	201	202
		S.D.	9.7	10.0	8.9	8.1
		N	12	12	12	12
DAY	7	MEAN	221	216	217	217
		S.D.	12.1	13.0	8.8	9.7
		N	12	12	12	12
DAY	14	MEAN	238	232	232	231
		S.D.	12.5	13.5	8.3	12.9
		N	12	12	12	12
DAY	21	MEAN	251	246	241	244
		S.D.	17.1	17.2	13.0	14.7
		N	12	12	12	12
DAY	28	MEAN	258	253	252	252
		S.D.	20.5	15.0	12.2	16.6
		N	12	12	12	12

No statistically significant differences

TABLE 3

PROPANE: COMBINED REPEATED-EXPOSURE TOXICITY, REPRODUCTION AND NEUROTOXICITY SCREENING IN RATS VIA WHOLE-BODY INHALATION EXPOSURES

MALES — MEAN BODY WEIGHT GAIN (GRAMS)

		DOSE GROUP:	1	2	3	4
		DOSE LEVEL (PPM):	0	1200	4000	12000
DAY -7 TO 0		MEAN	73	70	76	69
		S.D.	5.7	7.7	8.5	6.2
		N	12	12	12	12
DAY 0 TO 7		MEAN	48	46	48	36**
		S.D.	7.4	8.0	8.3	7.0
		N	12	12	12	12
DAY 7 TO 14		MEAN	36	31	34	28
		S.D.	8.6	9.6	9.6	7.4
		N	12	12	12	12
DAY 14 TO 21		MEAN	29	29	34	28
		S.D.	9.3	6.9	8.0	6.0
		N	12	12	12	12
DAY 21 TO 28		MEAN	28	23	26	18*
		S.D.	8.1	7.6	9.6	9.4
		N	12	12	12	12
DAY 0 TO 28		MEAN	141	129	142	112**
		S.D.	21.5	20.6	26.5	15.3
		N	12	12	12	12

Statistical key: * = p<0.05 ** = p<0.01

TABLE 3

PROPANE: COMBINED REPEATED-EXPOSURE TOXICITY, REPRODUCTION AND NEUROTOXICITY SCREENING IN RATS VIA WHOLE-BODY INHALATION EXPOSURES

FEMALES — MEAN BODY WEIGHT GAIN (GRAMS)

	DOSE GROUP:	1	2	3	4
	DOSE LEVEL (PPM):	0	1200	4000	12000
DAY -7 TO 0	MEAN	36	30	33	34
	S.D.	5.9	6.1	4.3	5.4
	N	12	12	12	12
DAY 0 TO 7	MEAN	17	17	15	15
	S.D.	7.6	8.9	3.8	5.8
	N	12	12	12	12
DAY 7 TO 14	MEAN	17	16	15	14
	S.D.	4.3	5.8	6.8	7.2
	N	12	12	12	12
DAY 14 TO 21	MEAN	13	15	10	13
	S.D.	7.7	8.8	8.5	3.7
	N	12	12	12	12
DAY 21 TO 28	MEAN	8	7	11	9
	S.D.	7.2	6.5	3.9	4.8
	N	12	12	12	12
DAY 0 TO 28	MEAN	54	54	51	50
	S.D.	13.2	10.7	7.8	13.3
	N	12	12	12	12

No statistically significant differences

TABLE 4

PROPANE: COMBINED REPEATED-EXPOSURE TOXICITY, REPRODUCTION AND NEUROTOXICITY SCREENING IN RATS VIA WHOLE-BODY INHALATION EXPOSURES

MALES — MEAN FEED CONSUMPTION (GRAMS/KG/DAY)

		DOSE GROUP:	1	2	3	4
		DOSE LEVEL (PPM):	0	1200	4000	12000
DAY	0	MEAN	100	103	105*	102
		S.D.	4.3	3.4	5.0	4.4
		N	12	12	12	12
DAY	7	MEAN	85	86	89	82
		S.D.	3.2	3.5	7.0	3.9
		N	12	12	12	12
DAY	14	MEAN	73	73	75	72
		S.D.	3.0	2.6	4.5	2.4
		N	12	12	12	12

Statistical key: * = p<0.05

TABLE 4

PROPANE: COMBINED REPEATED-EXPOSURE TOXICITY, REPRODUCTION AND NEUROTOXICITY SCREENING IN RATS VIA WHOLE-BODY INHALATION EXPOSURES

FEMALES — MEAN FEED CONSUMPTION (GRAMS/KG/DAY)

		DOSE GROUP:	1	2	3	4
		DOSE LEVEL (PPM):	0	1200	4000	12000
DAY	0	MEAN	98	98	94	94
		S.D.	3.7	4.8	5.3	5.4
		N	11	11	10	10
DAY	7	MEAN	84	84	81	80
		S.D.	6.0	4.3	5.0	3.4
		N	10	12	12	10
DAY	14	MEAN	81	79	78	77
		S.D.	2.6	4.9	4.3	4.1
		N	11	12	11	11
DAY	21	MEAN	74	75	73	72
		S.D.	3.1	4.6	3.4	3.7
		N	12	12	12	12
DAY	28	MEAN	69	70	68	67
		S.D.	4.8	4.2	3.7	2.3
		N	12	12	12	12

No statistically significant differences

Males	Summary of Functional Observational Battery Evaluations 4th Week of Exposure	Table 5

Exposure Level (ppm):		**Group 1 0**	**Group 2 1200**	**Group 3 4000**	**Group 4 12000**
Forelimb Grip Strength (grams of force)[1]					
	Mean	966.7	982.1	949.2	982.7
	S.D.	160.8	135.3	161.7	138.0
	N	12	12	12	12
Hindlimb Grip Strength (grams of force)[1]					
				*	
	Mean	705.8	675.0	792.1	693.1
	S.D.	67.6	56.4	109.4	95.4
	N	12	12	12	12
Rectal Temperature (°C)					
	Mean	37.3	37.6	37.2	37.1
	S.D.	1.1	1.2	1.5	12.6
	N	12	12	12	12

[1] The means of Trials 1 and 2 were calculated and statistically evaluated.
*Significantly different from control mean; $p \leq 0.05$.
**Significantly different from control mean; $p \leq 0.01$.
If no asterisks, no statistically significant differences from control mean.

Males	Summary of Functional Observational Battery Evaluations 4th Week of Exposure	Table 5

Exposure Level (ppm):		**Group 1 0**	**Group 2 1200**	**Group 3 4000**	**Group 4 12000**
Number of Animals Examined		12	12	12	12
Reflex Assessments					
Audition Assessment	Normal	12	12	12	12
	No Reaction	0	0	0	0
	Exaggerated	0	0	0	0
Pain Perception	Normal	9	12	11	12
	No Reaction	3	0	1	0
	Increased Pain	0	0	0	0

Females	Summary of Functional Observational Battery Evaluations 4th Week of Exposure	Table 5

Exposure Level (ppm):		Group 1 0	Group 2 1200	Group 3 4000	Group 4 12000
Forelimb Grip Strength (grams of force)[1]					
	Mean	872.3	920.8	869.2	923.1
	S.D.	77.9	105.2	131.3	131.8
	N	12	12	12	12
Hindlimb Grip Strength (grams of force)[1]					
	Mean	671.0	630.4	619.8	660.8
	S.D.	66.9	84.5	73.8	68.3
	N	12	12	12	12
Rectal Temperature(°C)					
	Mean	38.2	38.1	38.5	38.2
	S.D.	1.3	0.7	0.7	0.4
	N	12	12	12	12

[1] The means of Trials 1 and 2 were calculated and statistically evaluated.
*Significantly different from control mean; $p \leq 0.05$.
**Significantly different from control mean; $p \leq 0.01$.
If no asterisks, no statistically significant differences from control mean.

Females	Summary of Functional Observational Battery Evaluations 4th Week of Exposure	Table 5

Exposure Level (ppm):		**Group 1 0**	**Group 2 1200**	**Group 3 4000**	**Group 4 12000**
Number of Animals Examined		12	12	12	12
Reflex Assessments					
Audition Assessment	Normal	12	12	12	12
	No Reaction	0	0	0	0
	Exaggerated	0	0	0	0
Pain Perception	Normal	12	12	12	11
	No Reaction	0	0	0	1
	Increased Pain	0	0	0	0

	Mean Motor Activity Values Main Study 4th Week of Exposure	Table 6

Overview

The following is a brief summary of the statistical analysis of the motor activity data for Study 03-4245. Main study male and female rats were exposed to the test substance once daily (six hours/day), seven days/week for a minimum of 28 days. Inhalation exposure levels to the test substance, propane, were 0 (air control), 1200, 4000, and 12,000 ppm. Motor activity data were collected for twelve rats/sex/group in the 4th week of exposure. Motor activity data were analyzed using split-plot repeated measures analysis of variance, comparing active-treatment groups with the control. Appendices are provided with Huntingdon Life Sciences' figures and tables of the mean activity counts and with listings of the individual animal data.

Methods

Motor activity counts (the number of beam breaks in an automated Photobeam Activity System) were collected in twelve consecutive five-minute intervals during the 4th week of exposure. The details of the experimental procedures for motor activity are given in the study protocol.

Motor activity data were analyzed using split-plot repeated measures analysis of variance (ANOVA) with model terms for group, animal within group, interval and group by interval interaction. If the group by interval interaction was statistically significant, indicating non-parallelism in the behavioral profile between groups, a separate one-way ANOVA for group effects was performed at each interval. If the response data passed on the parallel hypothesis, an ANOVA (using summed responses over intervals) was used to test for the overall treatment effect with respect to the level hypothesis. If any significant overall treatment group effect was found by any of the above ANOVAs, Dunnett's t-test was used to find groups that differed from control. No investigation of model fit was requested or performed. Analyses were performed for sexes separately and combined. Treatment group effects were deemed significant at the $p=0.05$ level. Plots, tables, listings, and analyses were generated using SAS® version 8.2 for WINDOWS.

Results

The analysis results for motor activity data are summarized in Table 6-1. The parallel hypothesis, as indicated by no significant group by interval interaction, was accepted for males, females, and combined sexes. When the level hypothesis was tested for the males, females and combined sexes, no significant difference was found between different exposure groups. No pairwise comparison of dose groups was required.

	Mean Motor Activity Values Main Study 4th Week of Exposure	Table 6

Table 6-1. Summary of Statistical Results (p-values) for Motor Activity Data

Period	Sex	Parallel Hypothesis (p-value)	Level Hypothesis (p-value)	Significant Pairwise Results
4th Week of Exposure	Male	0.2720	0.6976	NA
	Female	0.8472	0.3435	NA
	Combined	0.8261	0.2896	NA

NA: not applicable

Discussion

There were no apparent dose-related effects on motor activity for either sex in this study.

Analysis Performed By:

Thomas Soeder
for Raymond Buck

Raymond D. Buck, PhD
Cato Research Ltd.

26 April 2006
Date

Males	Mean Motor Activity Values[a] Main Study 4th Week of Exposure	Table 6

	Interval												
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**Total**
Group 1 - 0 ppm													
Mean	195.6	142.3	134.9	95.3	94.8	62.7	47.8	42.6	24.3	32.9	15.3	16.1	904.5
SD	36.09	22.42	64.03	55.37	60.15	56.94	59.29	49.95	37.52	39.96	29.83	32.75	364.49
N	12	12	12	12	12	12	12	12	12	12	12	12	12
Group 2 – 1200 ppm													
Mean	202.8	165.4	131.6	101.8	57.5	39.7	29.3	22.0	9.3	11.3	14.2	21.3	806.2
SD	25.42	55.34	51.70	53.50	47.23	37.04	46.45	35.19	26.20	32.10	18.68	34.10	293.80
N	12	12	12	12	12	12	12	12	12	12	12	12	12
Group 3 – 4000 ppm													
Mean	203.1	128.2	105.1	80.4	51.2	56.0	53.8	33.3	18.4	10.3	30.4	20.8	790.8
SD	44.91	38.30	41.84	59.13	53.92	48.40	46.48	54.10	36.69	31.29	43.68	43.92	332.37
N	12	12	12	12	12	12	12	12	12	12	12	12	12
Group 4 - 12000 ppm													
Mean	190.1	139.8	134.2	76.7	62.2	52.1	24.0	26.9	18.3	6.1	8.0	29.4	767.8
SD	47.34	28.25	44.13	46.10	41.39	39.54	35.60	46.02	30.02	17.70	18.13	41.41	181.38
N	12	12	12	12	12	12	12	12	12	12	12	12	12

[a]Number of beam breaks per interval

Females	Mean Motor Activity Values[a] Main Study 4th Week of Exposure	Table 6

	Interval												
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**Total**
Group 1 - 0 ppm													
Mean	167.7	123.3	111.5	103.8	75.4	77.2	50.1	35.1	20.8	11.3	22.3	29.0	827.3
SD	35.33	35.29	21.37	34.34	38.11	38.58	50.84	31.72	25.47	26.87	32.78	35.35	221.74
N	12	12	12	12	12	12	12	12	12	12	12	12	12
Group 2 – 1200 ppm													
Mean	163.1	120.1	90.5	78.6	46.4	36.3	40.3	31.0	23.8	13.3	6.2	7.5	657.0
SD	39.92	34.01	27.56	31.43	32.27	39.31	50.51	50.33	35.49	35.71	12.32	16.51	246.67
N	12	12	12	12	12	12	12	12	12	12	12	12	12
Group 3 – 4000 ppm													
Mean	162.8	123.3	111.8	86.9	80.8	55.4	37.0	34.4	23.4	16.8	10.3	25.3	768.3
SD	24.15	17.15	36.68	31.32	50.90	44.89	44.12	41.28	43.51	39.83	15.31	43.12	224.58
N	12	12	12	12	12	12	12	12	12	12	12	12	12
Group 4 - 12000 ppm													
Mean	149.4	115.5	91.8	78.8	53.8	43.7	45.6	30.7	22.7	24.3	29.8	18.9	704.8
SD	25.89	44.00	39.06	46.79	46.19	50.59	57.36	51.08	35.79	37.41	42.44	30.00	267.81
N	12	12	12	12	12	12	12	12	12	12	12	12	12

[a]Number of beam breaks per interval

	Mean Hematology Values Preface	Table 7

Abbreviation	Parameter	Reporting Units
HGB	Hemoglobin Concentration	g/dL
HCT	Hematocrit	percent
RBC	Erythrocyte Count	$10^6/\mu L$
RETIC	Reticulocyte Count	$10^9/L$
PLT	Platelet Count	$10^3/\mu L$
MCV	Mean Corpuscular Volume	fL
MCH	Mean Corpuscular Hemoglobin	pg
MCHC	Mean Corpuscular Hemoglobin Concentration	g/dL
WBC	Total Leukocyte Count	$10^3/\mu L$
ANEU	Absolute Neutrophils	$10^3/\mu L$
ALYM	Absolute Lymphocytes	$10^3/\mu L$
AMONO	Absolute Monocytes	$10^3/\mu L$
AEOS	Absolute Eosinophils	$10^3/\mu L$
ABASO	Absolute Basophils	$10^3/\mu L$
ALUC	Absolute Large Unstained Cells	$10^3/\mu L$

Key to Statistical Symbols:

*Significantly different from control mean; $p \leq 0.05$.
**Significantly different from control mean; $p \leq 0.01$.
If no asterisks, no statistically significant differences from control mean.

Huntingdon Life Sciences Study No. 03-4245
Mean Hematology Values - Termination
Table 7 - Main Study

Group		HGB	HCT	RBC	RETIC	PLT	MCV	MCH	MCHC	WBC
		g/dL	%	x10^6/uL	x10^9/L	x10^3/uL	fL	pg	g/dL	x10^3/uL
1M										
0 ppm	Mean	15.5	47.0	8.21	185.9	914	57.3	18.9	32.9	15.48
	SD	0.61	1.45	0.431	67.88	223.0	1.86	0.68	0.61	3.710
	n	12	12	12	12	12	12	12	12	12
2M										
1200 ppm	Mean	15.7	47.3	8.25	179.5	842	57.3	19.0	33.2	13.00
	SD	0.37	1.22	0.223	26.76	132.8	1.16	0.36	0.43	3.550
	n	12	12	12	12	12	12	12	12	12
3M										
4000 ppm	Mean	15.7	47.6	8.17	165.6	843	58.2	19.3	33.1	13.78
	SD	0.58	2.06	0.455	20.27	140.2	1.52	0.57	0.45	3.618
	n	12	12	12	12	11	12	12	12	12
4M										
12000 ppm	Mean	15.5	47.0	8.35	158.7	889	56.3	18.6	33.0	13.02
	SD	0.51	1.71	0.395	28.02	166.0	1.14	0.51	0.41	1.630
	n	12	12	12	12	12	12	12	12	12

Huntingdon Life Sciences Study No. 03-4245
Mean Hematology Values - Termination
Table 7 - Main Study

Group		ANEU	ALYM	AMONO	AEOS	ABASO	ALUC
		x10^3/uL	x10^3/uL	x10^3/uL	x10^3/uL	x10^3/uL	x10^3/uL
1M							
0 ppm	Mean	1.76	13.13	0.25	0.11	0.14	0.10
	SD	0.696	3.259	0.140	0.060	0.044	0.036
	n	12	12	12	12	12	12
2M			*				
1200 ppm	Mean	1.93	10.40	0.36	0.14	0.10	0.07
	SD	0.510	3.213	0.516	0.072	0.046	0.053
	n	12	12	12	12	12	12
3M			*				
4000 ppm	Mean	2.19	10.96	0.26	0.17	0.12	0.08
	SD	0.711	2.956	0.094	0.134	0.054	0.034
	n	12	12	12	12	12	12
4M			*				
12000 ppm	Mean	1.97	10.48	0.22	0.13	0.11	0.11
	SD	0.680	1.346	0.093	0.095	0.026	0.111
	n	12	12	12	12	12	12

Huntingdon Life Sciences Study No. 03-4245
Mean Hematology Values - Termination
Table 7 - Main Study

Group		HGB	HCT	RBC	RETIC	PLT	MCV	MCH	MCHC	WBC
		g/dL	%	x10^6/uL	x10^9/L	x10^3/uL	fL	pg	g/dL	x10^3/uL
1F										
0 ppm	Mean	15.1	45.1	7.98	160.5	901	56.6	19.0	33.5	13.02
	SD	0.52	1.27	0.329	26.32	101.2	1.54	0.51	0.41	3.656
	n	12	12	12	12	12	12	12	12	12
2F										
1200 ppm	Mean	15.4	45.8	8.08	162.8	787	56.6	19.1	33.7	14.63
	SD	0.60	2.13	0.337	32.98	119.2	0.81	0.37	0.62	3.545
	n	12	12	12	12	12	12	12	12	12
3F										
4000 ppm	Mean	15.3	45.4	8.13	170.6	841	55.9	18.9	33.7	12.86
	SD	0.60	1.66	0.308	30.46	175.0	1.09	0.48	0.63	2.618
	n	12	12	12	12	12	12	12	12	12
4F		*	*	*						
12000 ppm	Mean	15.7	46.8	8.27	158.5	774	56.6	19.0	33.5	13.98
	SD	0.44	0.96	0.189	24.99	224.0	1.12	0.53	0.48	2.199
	n	12	12	12	12	12	12	12	12	12

Huntingdon Life Sciences Study No. 03-4245
Mean Hematology Values - Termination
Table 7 - Main Study

Group		ANEU	ALYM	AMONO	AEOS	ABASO	ALUC
		x10^3/uL	x10^3/uL	x10^3/uL	x10^3/uL	x10^3/uL	x10^3/uL
1F							
0 ppm	Mean	1.77	10.67	0.23	0.17	0.11	0.08
	SD	0.581	3.674	0.066	0.066	0.052	0.037
	n	12	12	12	12	12	12
2F							
1200 ppm	Mean	1.64	12.28	0.28	0.21	0.12	0.09
	SD	0.586	3.238	0.080	0.118	0.045	0.037
	n	12	12	12	12	12	12
3F							
4000 ppm	Mean	1.59	10.66	0.23	0.18	0.10	0.08
	SD	0.458	2.371	0.044	0.087	0.035	0.031
	n	12	12	12	12	12	12
4F					**		
12000 ppm	Mean	1.92	11.28	0.28	0.29	0.13	0.09
	SD	0.363	1.936	0.078	0.138	0.044	0.036
	n	12	12	12	12	12	12

	Mean Coagulation Values Preface	Table 8

Abbreviation	Parameter	Reporting Units
PT	Prothrombin Time	Seconds
APTT	Activated Partial Thromboplastin Time	Seconds

Key to Statistical Symbols:

*Significantly different from control mean; $p \leq 0.05$.
**Significantly different from control mean; $p \leq 0.01$.
If no asterisks, no statistically significant differences from control mean.

Huntingdon Life Sciences Study No. 03-4245
Mean Coagulation Values - Termination
Table 8 - Main Study

Group		PT	APTT
		Seconds	Seconds
1M			
0 ppm	Mean	14.0	23.7
	SD	1.35	1.69
	n	12	12
2M			
1200 ppm	Mean	13.7	24.0
	SD	0.81	2.06
	n	12	12
3M			
4000 ppm	Mean	14.2	24.1
	SD	1.59	2.27
	n	12	12
4M			
12000 ppm	Mean	14.1	23.6
	SD	0.87	2.31
	n	12	12

Huntingdon Life Sciences Study No. 03-4245
Mean Coagulation Values - Termination
Table 8 - Main Study

Group		PT	APTT
		Seconds	Seconds
1F			
0 ppm	Mean	11.6	21.3
	SD	0.42	1.57
	n	12	12
2F			
1200 ppm	Mean	11.4	21.3
	SD	0.30	2.35
	n	12	12
3F			
4000 ppm	Mean	11.9	22.7
	SD	0.37	1.66
	n	12	12
4F			
12000 ppm	Mean	11.9	22.6
	SD	0.41	2.45
	n	12	12

	Mean Clinical Chemistry Values Preface	Table 9

Abbreviation	Parameter	Reporting Units
AST	Aspartate Aminotransferase	U/L
ALT	Alanine Aminotransferase	U/L
ALKP	Alkaline Phosphatase	U/L
BUN	Blood Urea Nitrogen	mg/dL
CREAT	Creatinine	mg/dL
GLU	Fasting Glucose	mg/dL
CHOL	Cholesterol (Enzymatic)	mg/dL
TRIG	Triglycerides	mg/dL
TP	Total Protein	g/dL
ALB	Albumin	g/dL
GLOB	Globulin (calculated)	g/dL
A/G	Albumin/Globulin Ratio (calculated)	
TBILI	Total Bilirubin	mg/dL
Na^+	Sodium	mEq/L
K^+	Potassium	mEq/L
Cl^-	Chloride	mEq/L
Ca^{++}	Calcium	mg/dL
PHOS	Inorganic Phosphorus	mg/dL
GGT	Gamma-Glutamyl Transferase	U/L

Key to Statistical Symbols:

*Significantly different from control mean; $p \leq 0.05$.
**Significantly different from control mean; $p \leq 0.01$.
If no asterisks, no statistically significant differences from control mean.

Huntingdon Life Sciences Study No. 03-4245
Mean Clinical Chemistry Values - Termination
Table 9 - Main Study

Group		AST	ALT	ALKP	BUN	CREAT	GLU	CHOL	TRIG	TP
		U/L	U/L	U/L	mg/dL	mg/dL	mg/dL	mg/dL	mg/dL	g/dL
1M										
0 ppm	Mean	81	40	167	11.2	0.3	103	51	59	6.5
	SD	8.8	4.8	24.1	0.93	0.04	28.7	9.6	14.8	0.39
	n	12	12	12	12	12	12	12	12	12
2M										
1200 ppm	Mean	80	39	179	12.0	0.3	101	53	53	6.5
	SD	9.7	4.0	49.3	1.95	0.07	8.7	10.9	17.2	0.27
	n	12	12	12	12	12	12	12	12	12
3M										
4000 ppm	Mean	79	41	181	11.0	0.3	102	54	49	6.6
	SD	10.3	5.7	38.6	1.78	0.05	8.6	9.0	11.0	0.18
	n	12	12	12	12	12	12	12	12	12
4M										
12000 ppm	Mean	85	39	164	11.3	0.3	104	51	47	6.5
	SD	9.0	5.1	33.8	1.65	0.04	19.0	7.6	15.3	0.38
	n	12	12	12	12	12	12	12	12	12

Huntingdon Life Sciences Study No. 03-4245
Mean Clinical Chemistry Values - Termination
Table 9 - Main Study

Group		ALB	Glob	A/G	TBILI	Na+	K+	Cl-	Ca++	PHOS
		g/dL	g/dL		mg/dL	mEq/L	mEq/L	mEq/L	mg/dL	mg/dL
1M										
0 ppm	Mean	4.4	2.1	2.1	0.11	149	5.8	102	10.8	8.3
	SD	0.20	0.24	0.19	0.020	2.4	0.56	2.6	0.39	0.42
	n	12	12	12	12	12	12	12	12	12
2M										
1200 ppm	Mean	4.4	2.1	2.1	0.12	149	5.8	102	10.7	8.2
	SD	0.15	0.24	0.22	0.019	1.8	0.35	1.9	0.43	0.96
	n	12	12	12	12	12	12	12	12	12
3M										
4000 ppm	Mean	4.4	2.2	2.0	0.11	148	5.6	101	10.8	8.1
	SD	0.12	0.13	0.12	0.011	3.1	0.47	2.3	0.39	0.63
	n	12	12	12	12	12	12	12	12	12
4M										
12000 ppm	Mean	4.4	2.1	2.1	0.10	149	5.7	103	10.9	8.7
	SD	0.21	0.30	0.26	0.016	2.5	0.42	2.1	0.39	0.45
	n	12	12	12	12	12	12	12	12	12

Huntingdon Life Sciences Study No. 03-4245
Mean Clinical Chemistry Values - Termination
Table 9 - Main Study

Group		GGT
		U/L
1M		
0 ppm	Mean	0
	SD	0.0
	n	12
2M		
1200 ppm	Mean	0
	SD	0.0
	n	12
3M		
4000 ppm	Mean	0
	SD	0.0
	n	12
4M		
12000 ppm	Mean	0
	SD	0.0
	n	12

Huntingdon Life Sciences Study No. 03-4245
Mean Clinical Chemistry Values - Termination
Table 9 - Main Study

Group		AST	ALT	ALKP	BUN	CREAT	GLU	CHOL	TRIG	TP
		U/L	U/L	U/L	mg/dL	mg/dL	mg/dL	mg/dL	mg/dL	g/dL
1F										
0 ppm	Mean	81	34	86	13.7	0.4	103	67	39	7.2
	SD	10.5	3.7	20.4	1.47	0.05	6.9	14.5	11.7	0.41
	n	12	12	12	12	12	12	12	12	12
2F										
1200 ppm	Mean	83	34	93	14.5	0.4	99	68	39	7.2
	SD	6.9	4.5	16.4	1.43	0.07	5.4	11.7	8.0	0.38
	n	12	12	12	12	12	12	12	12	12
3F										
4000 ppm	Mean	78	36	89	13.2	0.4	100	73	50	7.3
	SD	9.2	6.1	17.5	1.11	0.05	10.4	15.8	29.5	0.34
	n	12	12	12	12	12	12	12	12	12
4F										
12000 ppm	Mean	79	34	88	13.8	0.4	104	70	43	7.3
	SD	4.7	4.3	17.1	1.91	0.07	7.9	10.6	9.2	0.32
	n	12	12	12	12	12	12	12	12	12

Huntingdon Life Sciences Study No. 03-4245
Mean Clinical Chemistry Values - Termination
Table 9 - Main Study

Group		ALB	Glob	A/G	TBILI	Na+	K+	Cl-	Ca++	PHOS
		g/dL	g/dL		mg/dL	mEq/L	mEq/L	mEq/L	mg/dL	mg/dL
1F										
0 ppm	Mean	4.9	2.2	2.2	0.14	147	5.7	103	11.2	7.7
	SD	0.24	0.25	0.24	0.029	1.6	0.44	1.2	0.36	0.76
	n	12	12	12	12	12	12	12	12	12
2F								**		
1200 ppm	Mean	5.0	2.2	2.3	0.16	147	5.9	101	11.2	7.9
	SD	0.33	0.22	0.33	0.025	1.4	0.42	1.8	0.27	0.69
	n	12	12	12	12	12	12	12	12	12
3F										
4000 ppm	Mean	4.9	2.4	2.1	0.15	147	5.6	103	11.1	7.6
	SD	0.23	0.18	0.15	0.021	1.6	0.44	1.9	0.17	0.87
	n	12	12	12	12	12	12	12	12	12
4F						*				
12000 ppm	Mean	5.0	2.3	2.2	0.15	148	5.6	103	11.4	8.0
	SD	0.21	0.23	0.24	0.031	1.3	0.42	1.0	0.36	1.17
	n	12	12	12	12	12	12	12	12	12

Huntingdon Life Sciences Study No. 03-4245
Mean Clinical Chemistry Values - Termination
Table 9 - Main Study

Group		GGT
		U/L
1F		
0 ppm	Mean	0
	SD	0.0
	n	12
2F		
1200 ppm	Mean	0
	SD	0.0
	n	12
3F		
4000 ppm	Mean	0
	SD	0.0
	n	12
4F		
12000 ppm	Mean	0
	SD	0.0
	n	12

	Mean Organ Weights Main Study Preface	Table 10

Table of Contents

Absolute Organ Weights 89
% Organ to Body Weight Ratios 93
% Organ to Brain Weight Ratios 97

Key to Abbreviations:

g = Grams
wt. = Weight
observ. = Observed

Corresponding exposure levels for each group were as follows:

Group 1 - 0 ppm
Group 2 - 1200 ppm
Group 3 - 4000 ppm
Group 4 - 12000 ppm

Note:

Ovaries w/Oviduct were weighed together.

Huntingdon Life Sciences
Princeton Research Center
East Millstone, New Jersey

Summary statistics for absolute organ weights (g)
Study number: 034245

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Table 10 - Main Study Animals

Group	Terminal Body wt. (g)	Adrenal Glands	Brain	Epididymis Right	Epididymis Left	Heart	Kidneys	Liver
				Male Animals				
1								
Mean:	377.5	0.0711	2.2497	0.6136	0.6344	1.5105	3.6463	12.4466
Standard deviation:	27.9	0.0155	0.0964	0.0640	0.0536	0.1959	0.2626	1.6451
Number of observ. :	(12)	(12)	(12)	(12)	(12)	(12)	(12)	(12)
2								
Mean:	370.3	0.0657	2.1967	0.6162	0.6154	1.4109	3.2484+	12.0528
Standard deviation:	29.1	0.0155	0.1378	0.0774	0.0820	0.2337	0.2594	1.2577
Number of observ. :	(12)	(12)	(12)	(12)	(12)	(12)	(12)	(12)
3								
Mean:	386.9	0.0703	2.2216	0.6452	0.6293	1.4502	3.5724	12.8873
Standard deviation:	33.9	0.0085	0.1248	0.0589	0.0439	0.1552	0.3345	1.0853
Number of observ. :	(12)	(12)	(12)	(12)	(12)	(12)	(12)	(12)
4								
Mean:	352.2	0.0632	2.2209	0.6171	0.6302	1.3819	3.2940+	11.1094*
Standard deviation:	21.7	0.0083	0.1407	0.0657	0.0687	0.2419	0.2230	1.1234
Number of observ. :	(12)	(12)	(12)	(12)	(12)	(12)	(12)	(12)

*(+) = mean value of group was significantly different from control at P = 0.05(0.01) with Dunnett's test of significance
%($) = mean value of group was significantly different from control at P = 0.05(0.01) with Modified T test of significance

Huntingdon Life Sciences
Princeton Research Center
East Millstone, New Jersey

Summary statistics for absolute organ weights (g)
Study number: 034245

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Table 10 - Main Study Animals

Group	Terminal Body wt. (g)	Lungs	Spleen	Testis Left	Testis Right	Thymus
			M a l e A n i m a l s			
1						
M e a n:	377.5	2.2276	0.7896	1.6754	1.6593	0.5545
Standard deviation:	27.9	0.5787	0.1390	0.1828	0.1631	0.0997
Number of observ. :	(12)	(12)	(12)	(12)	(12)	(12)
2						
M e a n:	370.3	1.9789	0.7011	1.6435	1.6413	0.4959
Standard deviation:	29.1	0.3151	0.1077	0.1797	0.1741	0.0988
Number of observ. :	(12)	(12)	(12)	(12)	(12)	(12)
3						
M e a n:	386.9	2.0582	0.7845	1.6759	1.6354	0.5097
Standard deviation:	33.9	0.1976	0.1399	0.1134	0.1292	0.1026
Number of observ. :	(12)	(12)	(12)	(12)	(12)	(12)
4						
M e a n:	352.2	1.8493	0.7144	1.6232	1.6356	0.4954
Standard deviation:	21.7	0.3129	0.1158	0.2010	0.1780	0.1063
Number of observ. :	(12)	(12)	(12)	(12)	(12)	(12)

*(+) = mean value of group was significantly different from control at P = 0.05(0.01) with Dunnett's test of significance
%($) = mean value of group was significantly different from control at P = 0.05(0.01) with Modified T test of significance

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Summary statistics for absolute organ weights (g)
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Table 10 - Main Study Animals

Group	Terminal Body wt. (g)	Adrenal Glands	Brain	Heart	Kidneys	Liver	Lungs	Ovary Left
			F e m a l e A n i m a l s					
1								
M e a n:	235.8	0.0720	1.9706	0.9376	2.1166	8.2773	1.5604	0.0745
Standard deviation:	16.8	0.0100	0.1233	0.0925	0.2193	0.9202	0.2337	0.0115
Number of observ. :	(12)	(12)	(12)	(12)	(12)	(12)	(12)	(12)
2								
M e a n:	234.1	0.0733	2.0392	0.9498	2.1055	8.0757	1.6050	0.0757
Standard deviation:	14.7	0.0133	0.1588	0.1136	0.2603	1.0644	0.3816	0.0146
Number of observ. :	(12)	(12)	(12)	(12)	(12)	(12)	(12)	(12)
3								
M e a n:	230.6	0.0671	2.0353	0.9470	2.0939	7.6527	1.5699	0.0777
Standard deviation:	11.9	0.0185	0.1213	0.1015	0.1833	0.6080	0.2756	0.0183
Number of observ. :	(12)	(12)	(12)	(12)	(12)	(12)	(12)	(12)
4								
M e a n:	229.0	0.0729	2.0318	0.9125	2.0485	7.7372	1.4820	0.0784
Standard deviation:	13.8	0.0096	0.1062	0.1228	0.2011	0.6618	0.1792	0.0161
Number of observ. :	(12)	(12)	(12)	(12)	(12)	(12)	(12)	(12)

*(+) = mean value of group was significantly different from control at P = 0.05(0.01) with Dunnett's test of significance
%($) = mean value of group was significantly different from control at P = 0.05(0.01) with Modified T test of significance

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Summary statistics for absolute organ weights (g)
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Table 10 - Main Study Animals

Group	Terminal Body wt. (g)	Ovary Right	Spleen	Thymus	Uterus w/vagina
			F e m a l e A n i m a l s		
1					
M e a n:	235.8	0.0685	0.5578	0.4626	0.8244
Standard deviation:	16.8	0.0101	0.0619	0.1053	0.1919
Number of observ. :	(12)	(12)	(12)	(12)	(12)
2					
M e a n:	234.1	0.0671	0.5331	0.4766	0.8250
Standard deviation:	14.7	0.0135	0.1246	0.1103	0.2983
Number of observ. :	(12)	(12)	(12)	(12)	(12)
3					
M e a n:	230.6	0.0645	0.5060	0.4818	0.9243
Standard deviation:	11.9	0.0092	0.0664	0.0819	0.3242
Number of observ. :	(12)	(12)	(12)	(12)	(12)
4					
M e a n:	229.0	0.0648	0.5322	0.4519	0.9197
Standard deviation:	13.8	0.0084	0.0869	0.0904	0.3664
Number of observ. :	(12)	(12)	(12)	(12)	(12)

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Summary Statistics for % Organ to Body Weight
Study number: 034245

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Table 10 - Main Study Animals

Group	Terminal Body wt. (g)	Adrenal Glands	Brain	Epididymis Left	Epididymis Right	Heart	Kidneys	Liver
				Male Animals				
1								
Mean:	377.5	0.0189	0.5983	0.1628	0.1684	0.4000	0.9672	3.2895
Standard deviation:	27.9	0.0044	0.0426	0.0151	0.0132	0.0405	0.0513	0.2802
Number of observ. :	(12)	(12)	(12)	(12)	(12)	(12)	(12)	(12)
2								
Mean:	370.3	0.0179	0.5969	0.1673	0.1665	0.3803	0.8794+	3.2614
Standard deviation:	29.1	0.0044	0.0620	0.0238	0.0200	0.0491	0.0652	0.3106
Number of observ. :	(12)	(12)	(12)	(12)	(12)	(12)	(12)	(12)
3								
Mean:	386.9	0.0182	0.5789	0.1682	0.1635	0.3771	0.9267	3.3371
Standard deviation:	33.9	0.0017	0.0663	0.0233	0.0147	0.0501	0.0897	0.2032
Number of observ. :	(12)	(12)	(12)	(12)	(12)	(12)	(12)	(12)
4								
Mean:	352.2	0.0179	0.6323	0.1758	0.1797	0.3928	0.9364	3.1521
Standard deviation:	21.7	0.0020	0.0481	0.0209	0.0229	0.0657	0.0508	0.2093
Number of observ. :	(12)	(12)	(12)	(12)	(12)	(12)	(12)	(12)

*(+) = mean value of group was significantly different from control at P = 0.05(0.01) with Dunnett's test of significance
%($) = mean value of group was significantly different from control at P = 0.05(0.01) with Modified T test of significance

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Table 10 - Main Study Animals

Summary Statistics for % Organ to Body Weight
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Group	Terminal Body wt. (g)	Lungs	Spleen	Testis Left	Testis Right	Thymus
			Male Animals			
1						
Mean:	377.5	0.5904	0.2085	0.4434	0.4395	0.1478
Standard deviation:	27.9	0.1437	0.0273	0.0281	0.0254	0.0305
Number of observ. :	(12)	(12)	(12)	(12)	(12)	(12)
2						
Mean:	370.3	0.5336	0.1892	0.4456	0.4447	0.1341
Standard deviation:	29.1	0.0669	0.0241	0.0512	0.0472	0.0264
Number of observ. :	(12)	(12)	(12)	(12)	(12)	(12)
3						
Mean:	386.9	0.5347	0.2026	0.4357	0.4250	0.1309
Standard deviation:	33.9	0.0600	0.0314	0.0430	0.0434	0.0180
Number of observ. :	(12)	(12)	(12)	(12)	(12)	(12)
4						
Mean:	352.2	0.5245	0.2029	0.4612	0.4648	0.1402
Standard deviation:	21.7	0.0766	0.0298	0.0515	0.0451	0.0280
Number of observ. :	(12)	(12)	(12)	(12)	(12)	(12)

*(+) = mean value of group was significantly different from control at P = 0.05(0.01) with Dunnett's test of significance
%($) = mean value of group was significantly different from control at P = 0.05(0.01) with Modified T test of significance

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Table 10 - Main Study Animals

Summary Statistics for % Organ to Body Weight
Study number: 034245

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Group	Terminal Body wt. (g)	Adrenal Glands	Brain	Heart	Kidneys	Liver	Lungs	Ovary Left
				Female Animals				
1								
Mean:	235.8	0.0305	0.8390	0.3978	0.9014	3.5146	0.6656	0.0317
Standard deviation:	16.8	0.0038	0.0717	0.0302	0.1083	0.3354	0.1122	0.0050
Number of observ. :	(12)	(12)	(12)	(12)	(12)	(12)	(12)	(12)
2								
Mean:	234.1	0.0313	0.8723	0.4063	0.8983	3.4402	0.6837	0.0323
Standard deviation:	14.7	0.0053	0.0637	0.0470	0.0843	0.3006	0.1471	0.0058
Number of observ. :	(12)	(12)	(12)	(12)	(12)	(12)	(12)	(12)
3								
Mean:	230.6	0.0292	0.8842	0.4107	0.9110	3.3228	0.6813	0.0337
Standard deviation:	11.9	0.0086	0.0596	0.0366	0.0996	0.2507	0.1181	0.0078
Number of observ. :	(12)	(12)	(12)	(12)	(12)	(12)	(12)	(12)
4								
Mean:	229.0	0.0318	0.8902	0.3995	0.8960	3.3936	0.6474	0.0345
Standard deviation:	13.8	0.0041	0.0704	0.0573	0.0857	0.3892	0.0685	0.0078
Number of observ. :	(12)	(12)	(12)	(12)	(12)	(12)	(12)	(12)

*(+) = mean value of group was significantly different from control at P = 0.05(0.01) with Dunnett's test of significance
%($) = mean value of group was significantly different from control at P = 0.05(0.01) with Modified T test of significance

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Summary Statistics for % Organ to Body Weight
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Table 10 - Main Study Animals

Group	Terminal Body wt. (g)	Ovary Right	Spleen	Thymus	Uterus w/vagina
			Female Animals		
1					
Mean:	235.8	0.0291	0.2376	0.1964	0.3513
Standard deviation:	16.8	0.0043	0.0304	0.0436	0.0876
Number of observ. :	(12)	(12)	(12)	(12)	(12)
2					
Mean:	234.1	0.0287	0.2269	0.2027	0.3513
Standard deviation:	14.7	0.0055	0.0464	0.0414	0.1191
Number of observ. :	(12)	(12)	(12)	(12)	(12)
3					
Mean:	230.6	0.0279	0.2193	0.2089	0.4006
Standard deviation:	11.9	0.0030	0.0245	0.0330	0.1371
Number of observ. :	(12)	(12)	(12)	(12)	(12)
4					
Mean:	229.0	0.0283	0.2318	0.1964	0.4032
Standard deviation:	13.8	0.0035	0.0304	0.0307	0.1638
Number of observ. :	(12)	(12)	(12)	(12)	(12)

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%($) = mean value of group was significantly different from control at P = 0.05(0.01) with Modified T test of significance

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Table 10 - Main Study Animals

Summary Statistics for % Organ to Brain Weight
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Group	Terminal Body wt. (g)	Adrenal Glands	Epididymis Left	Epididymis Right	Heart	Kidneys	Liver	Lungs
				Male Animals				
1								
Mean:	377.5	3.1734	27.2640	28.2124	67.1932	162.1979	553.2197	98.8361
Standard deviation:	27.9	0.7579	2.4204	2.2152	8.8473	11.6025	67.1373	24.0309
Number of observ. :	(12)	(12)	(12)	(12)	(12)	(12)	(12)	(12)
2								
Mean:	370.3	2.9982	28.1042	28.1203	64.1523	148.2546*	551.1848	90.0920
Standard deviation:	29.1	0.7035	3.5552	4.2961	9.2373	13.5526	72.2993	13.4815
Number of observ. :	(12)	(12)	(12)	(12)	(12)	(12)	(12)	(12)
3								
Mean:	386.9	3.1812	29.1535	28.4371	65.3449	161.2730	581.7386	92.7615
Standard deviation:	33.9	0.4920	3.4773	2.9502	6.8652	17.7824	59.3762	8.6980
Number of observ. :	(12)	(12)	(12)	(12)	(12)	(12)	(12)	(12)
4								
Mean:	352.2	2.8583	27.8847	28.4655	61.9801	148.6755	500.9430	82.9269
Standard deviation:	21.7	0.4335	3.4328	3.4576	7.9185	11.2910	48.1702	10.3485
Number of observ. :	(12)	(12)	(12)	(12)	(12)	(12)	(12)	(12)

*(+) = mean value of group was significantly different from control at P = 0.05(0.01) with Dunnett's test of significance
%($) = mean value of group was significantly different from control at P = 0.05(0.01) with Modified T test of significance

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Summary Statistics for % Organ to Brain Weight
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Table 10 - Main Study Animals

Group	Terminal Body wt. (g)	Testis Left Spleen	Testis Right	Thymus
		Male Animals		
1				
Mean:	377.5	35.1668	74.5030	73.7973	24.6923
Standard deviation:	27.9	6.3883	7.5819	6.8266	4.6095
Number of observ. :	(12)	(12)	(12)	(12)	(12)
2				
Mean:	370.3	31.9198	75.0753	75.0013	22.6934
Standard deviation:	29.1	4.4154	9.6456	9.6672	4.7758
Number of observ. :	(12)	(12)	(12)	(12)	(12)
3				
Mean:	386.9	35.4763	75.5270	73.7035	23.0398
Standard deviation:	33.9	7.0144	4.7243	5.5859	5.0144
Number of observ. :	(12)	(12)	(12)	(12)	(12)
4				
Mean:	352.2	32.1511	72.9669	73.5879	22.4854
Standard deviation:	21.7	4.6123	6.2297	5.6094	5.4599
Number of observ. :	(12)	(12)	(12)	(12)	(12)

*(+) = mean value of group was significantly different from control at P = 0.05(0.01) with Dunnett's test of significance
%($) = mean value of group was significantly different from control at P = 0.05(0.01) with Modified T test of significance

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Table 10 - Main Study Animals

Group	Terminal Body wt. (g)	Adrenal Glands	Heart	Kidneys	Liver	Lungs	Ovary Left	Ovary Right
				Female Animals				
1								
Mean:	235.8	3.6657	47.6711	107.5395	420.9343	79.0868	3.7888	3.4712
Standard deviation:	16.8	0.5515	4.7910	10.2565	46.7465	9.8064	0.6051	0.4547
Number of observ. :	(12)	(12)	(12)	(12)	(12)	(12)	(12)	(12)
2								
Mean:	234.1	3.5872	46.9463	103.1656	396.1591	79.4651	3.6981	3.2935
Standard deviation:	14.7	0.5378	8.1073	8.8139	44.1979	22.5572	0.5587	0.6542
Number of observ. :	(12)	(12)	(12)	(12)	(12)	(12)	(12)	(12)
3								
Mean:	230.6	3.3081	46.5348	102.9150	376.7819*	76.7958	3.7958	3.1652
Standard deviation:	11.9	0.9593	4.1507	7.0253	32.2909	10.0588	0.7430	0.3857
Number of observ. :	(12)	(12)	(12)	(12)	(12)	(12)	(12)	(12)
4								
Mean:	229.0	3.5895	44.8952	100.7973	380.6778*	73.0452	3.8421	3.1892
Standard deviation:	13.8	0.4765	5.4802	7.7995	23.6115	9.1502	0.6625	0.3971
Number of observ. :	(12)	(12)	(12)	(12)	(12)	(12)	(12)	(12)

*(+) = mean value of group was significantly different from control at P = 0.05(0.01) with Dunnett's test of significance
%($) = mean value of group was significantly different from control at P = 0.05(0.01) with Modified T test of significance

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Summary Statistics for % Organ to Brain Weight
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Table 10 - Main Study Animals

Group	Terminal Body wt. (g)	Spleen	Thymus	Uterus w/vagina
			Female Animals	
1				
Mean:	235.8	28.4223	23.6054	42.0988
Standard deviation:	16.8	3.6536	5.7353	10.8072
Number of observ. :	(12)	(12)	(12)	(12)
2				
Mean:	234.1	26.0760	23.5683	40.4117
Standard deviation:	14.7	5.3462	6.1004	13.7058
Number of observ. :	(12)	(12)	(12)	(12)
3				
Mean:	230.6	24.8267	23.6764	45.0744
Standard deviation:	11.9	2.5614	3.8015	13.9695
Number of observ. :	(12)	(12)	(12)	(12)
4				
Mean:	229.0	26.1856	22.2459	45.2701
Standard deviation:	13.8	4.0968	4.4039	17.6240
Number of observ. :	(12)	(12)	(12)	(12)

*(+) = mean value of group was significantly different from control at P = 0.05(0.01) with Dunnett's test of significance
%($) = mean value of group was significantly different from control at P = 0.05(0.01) with Modified T test of significance

	Incidence Summary Report for Gross Necropsy Observations Preface	Table 11

Corresponding exposure levels for each group were as follows:

Group 1 - 0 ppm
Group 2 - 1200 ppm
Group 3 - 4000 ppm
Group 4 - 12000 ppm

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Incidence Summary Report for Gross Necropsy Observations
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Table 11 - Main Study

	-- Males --				-- Females --			
Group:	1	2	3	4	1	2	3	4
Number in group:	12	12	12	12	12	12	12	12
Within normal limits	8	11	11	12	10	11	9	10
Kidneys								
Dilated Pelvis	0	0	0	0	0	0	1	0
Liver								
Mass	1	0	0	0	0	0	0	0
Lungs								
Discolored	1	0	0	0	0	0	1	1
Spleen								
Irregular Shape	0	0	0	0	0	1	0	0
Thymus								
Discolored	0	0	0	0	0	0	1	0
Uterus								
Distended	0	0	0	0	0	0	2	1
Skin (other)								
Hair Thin/Absent	2	0	1	0	2	0	0	1
Scab	0	1	0	0	0	0	0	0

	Incidence Summary of Microscopic Findings with Severity Levels Preface	Table 12

Key to Abbreviations

Ctls	=	Controls (Group 1)
LN	=	Lymph Node
Oviducts/Fallop	=	Oviducts/Fallopian
SC	=	Spinal Cord

Corresponding exposure levels for each group were as follows:

Group 1 - 0 ppm
Group 4 - 12000 ppm

Propane: Combined Repeated-Exposure Toxicity,
Reproduction and Neurotoxicity Screening in Rats
via Whole-Body Inhalation Exposures

Incidence Summary of Microscopic Findings with Severity Levels
Main Study Animals

Controls from group(s): 1	Animal sex:	-- Animals Affected -- Males --				-- Animals Affected -- Females --			
	Dosage group:	Ctls	2	3	4	Ctls	2	3	4
Tissues With Diagnoses	No. in group:	12	12	12	12	12	12	12	12
Adrenal Glands	Number examined:	12	0	0	12	12	0	0	12
Brain	Number examined:	12	0	0	12	12	0	0	12
Cecum	Number examined:	12	0	0	12	12	0	0	12
Cervical SC	Number examined:	12	0	0	12	12	0	0	12
Colon	Number examined:	12	0	0	12	12	0	0	12
Duodenum	Number examined:	12	0	0	12	12	0	0	12
Epididymides	Number examined:	12	0	0	12				
MONONUCLEAR CELL AGGREGATES									
	Nad>	12	0	0	8				
	Minimal>	0	0	0	4				
.....Total Incidence of Finding	Observed:	0	0	0	4				
Femoral Marrow	Number examined:	12	0	0	12	12	0	0	12
MEDULLARY CYST(S)									
	Nad>	12	0	0	12	12	0	0	11
	Slight>	0	0	0	0	0	0	0	1
.....Total Incidence of Finding	Observed:	0	0	0	0	0	0	0	1
Femur	Number examined:	12	0	0	12	12	0	0	12
EPIPHYSEAL SUBCHONDRAL CYST(S)									
	Nad>	12	0	0	10	12	0	0	12
	Minimal>	0	0	0	1	0	0	0	0
	Slight>	0	0	0	1	0	0	0	0
.....Total Incidence of Finding	Observed:	0	0	0	2	0	0	0	0

All Diagnoses; Phases: P2; Death types: Scheduled FS; Date of death range: 17-Feb-04 To 18-Feb-04

Propane: Combined Repeated-Exposure Toxicity,
Reproduction and Neurotoxicity Screening in Rats
via Whole-Body Inhalation Exposures

Incidence Summary of Microscopic Findings with Severity Levels
Main Study Animals

Controls from group(s): 1	Animal sex:	-- Animals Affected -- Males --				-- Females --			
	Dosage group:	Ctls	2	3	4	Ctls	2	3	4
Tissues With Diagnoses	No. in group:	12	12	12	12	12	12	12	12
Heart	Number examined:	12	0	0	12	12	0	0	12
SUBACUTE/CHRONIC INFLAMMATORY CELL INFILTRATE									
	Nad>	7	0	0	8	8	0	0	6
	Minimal>	5	0	0	3	4	0	0	6
	Slight>	0	0	0	1	0	0	0	0
.....Total Incidence of Finding	Observed:	5	0	0	4	4	0	0	6
Ileum	Number examined:	12	0	0	12	12	0	0	12
Jejunum	Number examined:	12	0	0	12	12	0	0	12
Kidneys	Number examined:	12	0	0	12	12	0	0	12
TUBULAR EOSINOPHILIC CASTS									
	Nad>	12	0	0	11	12	0	0	12
	Minimal>	0	0	0	1	0	0	0	0
.....Total Incidence of Finding	Observed:	0	0	0	1	0	0	0	0
CORTEX: CONVOLUTED TUBULAR EPITHELIUM-BASOPHILIC									
	Nad>	10	0	0	10	10	0	0	12
	Minimal>	2	0	0	2	2	0	0	0
.....Total Incidence of Finding	Observed:	2	0	0	2	2	0	0	0
CORTICAL TUBULAR DILATATION									
	Nad>	11	0	0	12	12	0	0	11
	Minimal>	1	0	0	0	0	0	0	1
.....Total Incidence of Finding	Observed:	1	0	0	0	0	0	0	1
CORTEX/CORTICO-MEDULLARY JUNCTION: TUBULE(S) DILATED									
	Nad>	11	0	0	10	12	0	0	11
	Minimal>	0	0	0	1	0	0	0	1
	Slight>	1	0	0	1	0	0	0	0
.....Total Incidence of Finding	Observed:	1	0	0	2	0	0	0	1

All Diagnoses; Phases: P2; Death types: Scheduled FS; Date of death range: 17-Feb-04 To 18-Feb-04

Propane: Combined Repeated-Exposure Toxicity,
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Incidence Summary of Microscopic Findings with Severity Levels
Main Study Animals

Controls from group(s): 1	Animal sex:	-- Animals Affected -- Males --				-- Females --			
	Dosage group:	Ctls	2	3	4	Ctls	2	3	4
Tissues With Diagnoses	No. in group:	12	12	12	12	12	12	12	12
Kidneys	Number examined:	12	0	0	12	12	0	0	12
MEDULLARY TUBULAR CYSTIC DILATATION									
	Nad>	12	0	0	12	11	0	0	12
	Moderate>	0	0	0	0	1	0	0	0
.....Total Incidence of Finding	Observed:	0	0	0	0	1	0	0	0
PELVIC DILATATION									
	Nad>	8	0	0	7	11	0	0	11
	Minimal>	0	0	0	2	0	0	0	0
	Slight>	2	0	0	2	1	0	0	1
	Moderate>	2	0	0	1	0	0	0	0
.....Total Incidence of Finding	Observed:	4	0	0	5	1	0	0	1
CORTEX/CORTICO-MEDULLARY JUNCTION: MINERAL DEPOSIT(S)									
	Nad>	11	0	0	12	6	0	0	4
	Minimal>	1	0	0	0	6	0	0	8
.....Total Incidence of Finding	Observed:	1	0	0	0	6	0	0	8
MEDULLA: MINERAL DEPOSIT(S)									
	Nad>	10	0	0	11	12	0	0	11
	Minimal>	2	0	0	1	0	0	0	1
.....Total Incidence of Finding	Observed:	2	0	0	1	0	0	0	1
INTERSTITIAL MONONUCLEAR CELL AGGREGATES									
	Nad>	11	0	0	11	12	0	0	12
	Minimal>	1	0	0	1	0	0	0	0
.....Total Incidence of Finding	Observed:	1	0	0	1	0	0	0	0
Liver	Number examined:	12	0	0	12	12	0	0	12
SUBACUTE/CHRONIC INFLAMMATORY CELL FOCI									
	Nad>	8	0	0	6	10	0	0	6
	Minimal>	4	0	0	6	2	0	0	6
.....Total Incidence of Finding	Observed:	4	0	0	6	2	0	0	6

All Diagnoses; Phases: P2; Death types: Scheduled FS; Date of death range: 17-Feb-04 To 18-Feb-04

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Incidence Summary of Microscopic Findings with Severity Levels
Main Study Animals

Controls from group(s): 1	Animal sex:	-- Animals Affected -- Males --				-- Females --			
	Dosage group:	Ctls	2	3	4	Ctls	2	3	4
Tissues With Diagnoses	No. in group:	12	12	12	12	12	12	12	12
Liver	Number examined:	12	0	0	12	12	0	0	12
MICROGRANULOMATOUS FOCI									
	Nad>	10	0	0	12	12	0	0	12
	Minimal>	2	0	0	0	0	0	0	0
.....Total Incidence of Finding	Observed:	2	0	0	0	0	0	0	0
INFARCTION WITH HEMORRHAGE, BILIARY HYPERPLASIA, -GRANULOMATOUS INFLAMMATION, GRANULATION TISSUE, AND -MINERALIZATION									
	Nad>	11	0	0	12	12	0	0	12
	Severe>	1	0	0	0	0	0	0	0
.....Total Incidence of Finding	Observed:	1	0	0	0	0	0	0	0
Lumbar SC	Number examined:	12	0	0	12	12	0	0	12
Lungs	Number examined:	12	0	0	12	12	0	0	12
PERIALVEOLAR/PERIVASCULAR SUBACUTE/CHRONIC INFLAMMATORY -CELL INFILTRATE									
	Nad>	8	0	0	3	8	0	0	7
	Minimal>	4	0	0	9	4	0	0	4
	Slight>	0	0	0	0	0	0	0	1
.....Total Incidence of Finding	Observed:	4	0	0	9	4	0	0	5
SUBACUTE/CHRONIC INFLAMMATORY CELL FOCI									
	Nad>	9	0	0	7	9	0	0	11
	Minimal>	3	0	0	5	2	0	0	0
	Slight>	0	0	0	0	1	0	0	1
.....Total Incidence of Finding	Observed:	3	0	0	5	3	0	0	1
ALVEOLAR/INTRAALVEOLAR MACROPHAGES									
	Nad>	2	0	0	1	0	0	0	0
	Minimal>	10	0	0	11	12	0	0	12
.....Total Incidence of Finding	Observed:	10	0	0	11	12	0	0	12

All Diagnoses; Phases: P2; Death types: Scheduled FS; Date of death range: 17-Feb-04 To 18-Feb-04

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Main Study Animals

Controls from group(s): 1	Animal sex:	-- Animals Affected -- Males --				-- Females --			
	Dosage group:	Ctls	2	3	4	Ctls	2	3	4
Tissues With Diagnoses	No. in group:	12	12	12	12	12	12	12	12
Lungs	Number examined:	12	0	0	12	12	0	0	12
FOAMY MACROPHAGES									
	Nad>	12	0	0	12	11	0	0	11
	Minimal>	0	0	0	0	1	0	0	0
	Slight>	0	0	0	0	0	0	0	1
.....Total Incidence of Finding	Observed:	0	0	0	0	1	0	0	1
VESSEL MINERALIZATION									
	Nad>	6	0	0	5	4	0	0	3
	Minimal>	6	0	0	7	8	0	0	9
.....Total Incidence of Finding	Observed:	6	0	0	7	8	0	0	9
PLEURAL MESENTERY: MINERALIZATION									
	Nad>	12	0	0	12	12	0	0	11
	Slight>	0	0	0	0	0	0	0	1
.....Total Incidence of Finding	Observed:	0	0	0	0	0	0	0	1
ARTERIOLE: MEDIAL DEGENERATION WITH GRANULOMATOUS -INFLAMMATORY CELL INFILTRATE									
	Nad>	12	0	0	12	12	0	0	11
	Slight>	0	0	0	0	0	0	0	1
.....Total Incidence of Finding	Observed:	0	0	0	0	0	0	0	1
INTERSTITIAL FIBROSIS									
	Nad>	11	0	0	12	12	0	0	12
	Slight>	1	0	0	0	0	0	0	0
.....Total Incidence of Finding	Observed:	1	0	0	0	0	0	0	0
Mammary-protocol	Number examined:	12	0	0	12	12	0	0	12
MALE TYPE: (UNDIFFRENTIATED TYPE)									
	Nad>	0	0	0	0	12	0	0	12
	Present>	12	0	0	12	0	0	0	0
.....Total Incidence of Finding	Observed:	12	0	0	12	0	0	0	0

All Diagnoses; Phases: P2; Death types: Scheduled FS; Date of death range: 17-Feb-04 To 18-Feb-04

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Incidence Summary of Microscopic Findings with Severity Levels
Main Study Animals

Controls from group(s): 1	Animal sex:	-- Animals Affected -- Males --				-- Females --			
	Dosage group:	Ctls	2	3	4	Ctls	2	3	4
Tissues With Diagnoses	No. in group:	12	12	12	12	12	12	12	12
Mammary-protocol	Number examined:	12	0	0	12	12	0	0	12
FEMALE TYPE (DIFFERENTIATED TYPE)									
	Nad>	12	0	0	12	0	0	0	0
	Present>	0	0	0	0	12	0	0	12
Total Incidence of Finding	Observed:	0	0	0	0	12	0	0	12
Mediastinal LN	Number examined:	12	0	0	12	11	0	0	11
CORTICAL LYMPHOCYTES/UNIT AREA									
	Nad>	0	0	0	1	0	0	0	0
	Minimal>	5	0	0	6	6	0	0	7
	Slight>	3	0	0	2	5	0	0	4
	Moderate>	4	0	0	3	0	0	0	0
Total Incidence of Finding	Observed:	12	0	0	11	11	0	0	11
PARACORTICAL LYMPHOCYTES/UNIT AREA									
	Nad>	2	0	0	0	0	0	0	0
	Slight>	1	0	0	1	0	0	0	0
	Moderate>	5	0	0	6	9	0	0	7
	Marked>	4	0	0	5	2	0	0	4
Total Incidence of Finding	Observed:	10	0	0	12	11	0	0	11
FOLLICULAR GERMINAL CENTER DEVELOPMENT									
	Nad>	4	0	0	4	7	0	0	3
	Minimal>	2	0	0	0	2	0	0	3
	Slight>	3	0	0	3	2	0	0	4
	Moderate>	3	0	0	5	0	0	0	1
Total Incidence of Finding	Observed:	8	0	0	8	4	0	0	8
FREE ERYTHROCYTES/ERYTHROPHAGOCYTOSIS									
	Nad>	3	0	0	6	2	0	0	0
	Minimal>	5	0	0	4	7	0	0	5
	Slight>	4	0	0	2	2	0	0	6
Total Incidence of Finding	Observed:	9	0	0	6	9	0	0	11

All Diagnoses; Phases: P2; Death types: Scheduled FS; Date of death range: 17-Feb-04 To 18-Feb-04

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Incidence Summary of Microscopic Findings with Severity Levels
Main Study Animals

Controls from group(s): 1	Animal sex:	-- Animals Affected -- Males --				-- Animals Affected -- Females --			
	Dosage group:	Ctls	2	3	4	Ctls	2	3	4
Tissues With Diagnoses	No. in group:	12	12	12	12	12	12	12	12
Mediastinal LN	Number examined:	12	0	0	12	11	0	0	11
BROWN PIGMENT									
	Nad>	10	0	0	12	10	0	0	10
	Slight>	2	0	0	0	0	0	0	1
	Moderate>	0	0	0	0	1	0	0	0
.....Total Incidence of Finding	Observed:	2	0	0	0	1	0	0	1
PROMINENT HISTIOCYTES									
	Nad>	8	0	0	7	11	0	0	9
	Minimal>	2	0	0	5	0	0	0	2
	Slight>	2	0	0	0	0	0	0	0
.....Total Incidence of Finding	Observed:	4	0	0	5	0	0	0	2
PROMINENT PLASMA CELLS									
	Nad>	6	0	0	9	9	0	0	8
	Minimal>	4	0	0	0	1	0	0	3
	Slight>	1	0	0	2	1	0	0	0
	Moderate>	0	0	0	1	0	0	0	0
	Marked>	1	0	0	0	0	0	0	0
.....Total Incidence of Finding	Observed:	6	0	0	3	2	0	0	3
Mesenteric LN	Number examined:	12	0	0	12	12	0	0	12
CORTICAL LYMPHOCYTES/UNIT AREA									
	Minimal>	4	0	0	2	1	0	0	1
	Slight>	6	0	0	5	6	0	0	6
	Moderate>	2	0	0	5	5	0	0	5
.....Total Incidence of Finding	Observed:	12	0	0	12	12	0	0	12
PARACORTICAL LYMPHOCYTES/UNIT AREA									
	Moderate>	2	0	0	4	6	0	0	8
	Marked>	10	0	0	7	6	0	0	4
	Severe>	0	0	0	1	0	0	0	0
.....Total Incidence of Finding	Observed:	12	0	0	12	12	0	0	12

All Diagnoses; Phases: P2; Death types: Scheduled FS; Date of death range: 17-Feb-04 To 18-Feb-04

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Main Study Animals

Controls from group(s): 1	Animal sex:	-- Animals Affected -- Males --				-- Females --			
	Dosage group:	Ctls	2	3	4	Ctls	2	3	4
Tissues With Diagnoses	No. in group:	12	12	12	12	12	12	12	12
Mesenteric LN	Number examined:	12	0	0	12	12	0	0	12
FOLLICULAR GERMINAL CENTER DEVELOPMENT									
	Minimal>	1	0	0	0	0	0	0	0
	Slight>	1	0	0	1	1	0	0	1
	Moderate>	10	0	0	11	11	0	0	11
.....Total Incidence of Finding	Observed:	12	0	0	12	12	0	0	12
FREE ERYTHROCYTES/ERYTHROPHAGOCYTOSIS									
	Nad>	8	0	0	9	12	0	0	11
	Minimal>	4	0	0	3	0	0	0	1
.....Total Incidence of Finding	Observed:	4	0	0	3	0	0	0	1
PROMINENT HISTIOCYTES									
	Nad>	0	0	0	4	3	0	0	4
	Minimal>	10	0	0	6	7	0	0	7
	Slight>	2	0	0	2	2	0	0	1
.....Total Incidence of Finding	Observed:	12	0	0	8	9	0	0	8
PROMINENT PLASMA CELLS									
	Nad>	5	0	0	7	8	0	0	8
	Minimal>	3	0	0	4	3	0	0	2
	Slight>	4	0	0	1	1	0	0	2
.....Total Incidence of Finding	Observed:	7	0	0	5	4	0	0	4
Ovaries	Number examined:					12	0	0	12
SERTOLIFORM CELLS									
	Nad>					9	0	0	10
	Minimal>					2	0	0	1
	Slight>					1	0	0	1
.....Total Incidence of Finding	Observed:					3	0	0	2

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Incidence Summary of Microscopic Findings with Severity Levels
Main Study Animals

Controls from group(s): 1	Animal sex:	-- Animals Affected -- Males --				-- Females --			
	Dosage group:	Ctls	2	3	4	Ctls	2	3	4
Tissues With Diagnoses	No. in group:	12	12	12	12	12	12	12	12
Ovaries	Number examined:					12	0	0	12
MINERALIZATION									
	Nad>					12	0	0	11
	Minimal>					0	0	0	1
.....Total Incidence of Finding	Observed:					0	0	0	1
Oviducts/Fallop	Number examined:					12	0	0	12
Parathyroid	Number examined:	6	0	0	4	4	0	0	6
Prostate	Number examined:	12	0	0	12				
INTERSTITIAL MONONUCLEAR CELL AGGREGATES									
	Nad>	5	0	0	10				
	Minimal>	6	0	0	1				
	Slight>	1	0	0	1				
.....Total Incidence of Finding	Observed:	7	0	0	2				
MICROGRANULOMATOUS INFLAMMATORY CELL INFILTRATE									
	Nad>	11	0	0	12				
	Minimal>	1	0	0	0				
.....Total Incidence of Finding	Observed:	1	0	0	0				
Rectum/Low Colon	Number examined:	12	0	0	12	12	0	0	12
INTRALUMINAL (HELMINTHIC) PARASITE									
	Nad>	12	0	0	11	12	0	0	12
	Minimal>	0	0	0	1	0	0	0	0
.....Total Incidence of Finding	Observed:	0	0	0	1	0	0	0	0
Seminal vesicles	Number examined:	12	0	0	12				

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Controls from group(s): 1	Animal sex:	-- Animals Affected -- Males --				-- Animals Affected -- Females --			
	Dosage group:	Ctls	2	3	4	Ctls	2	3	4
Tissues With Diagnoses	No. in group:	12	12	12	12	12	12	12	12
Skin (other) .....Number examined:		2	0	0	0	2	0	0	2
PYOGRANULOMATOUS INFLAMMATORY CELL INFILTRATE									
	Nad>	2	0	0	0	1	0	0	2
	Moderate>	0	0	0	0	1	0	0	0
.....Total Incidence of Finding Observed:		0	0	0	0	1	0	0	0
HYPERKERATOSIS WITH ENCRUSTATION									
	Nad>	2	0	0	0	2	0	0	1
	Slight>	0	0	0	0	0	0	0	1
.....Total Incidence of Finding Observed:		0	0	0	0	0	0	0	1
FOLLICULAR HYPERKERATOSIS									
	Nad>	2	0	0	0	1	0	0	2
	Minimal>	0	0	0	0	1	0	0	0
.....Total Incidence of Finding Observed:		0	0	0	0	1	0	0	0
HAIR FOLLICLE: MATRIX/PAPILLA/SHAFT DEGENERATION/NECROSIS									
	Nad>	2	0	0	0	1	0	0	1
	Minimal>	0	0	0	0	1	0	0	0
	Slight>	0	0	0	0	0	0	0	1
.....Total Incidence of Finding Observed:		0	0	0	0	1	0	0	1
HAIR FOLLICLES: EMPTY/HAIR SHAFT ABSENT									
	Nad>	1	0	0	0	2	0	0	2
	Slight>	1	0	0	0	0	0	0	0
.....Total Incidence of Finding Observed:		1	0	0	0	0	0	0	0
FOLLICULAR DILATATION									
	Nad>	0	0	0	0	1	0	0	2
	Minimal>	2	0	0	0	1	0	0	0
.....Total Incidence of Finding Observed:		2	0	0	0	1	0	0	0

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Controls from group(s): 1	Animal sex:	-- Animals Affected -- Males --				-- Females --			
	Dosage group:	Ctls	2	3	4	Ctls	2	3	4
Tissues With Diagnoses	No. in group:	12	12	12	12	12	12	12	12
Skin-protocol	Number examined:	12	0	0	12	12	0	0	12
FOLLICULAR DILATATION/HAIR FOLLICLES: EMPTY/WITHOUT -HAIRSHAFT									
	Nad>	7	0	0	8	9	0	0	8
	Minimal>	5	0	0	4	3	0	0	4
.....	Total Incidence of Finding Observed:	5	0	0	4	3	0	0	4
DECREASE/FEW HAIR FOLLICLES/APPENDAGES									
	Nad>	11	0	0	12	12	0	0	10
	Minimal>	1	0	0	0	0	0	0	0
	Slight>	0	0	0	0	0	0	0	2
.....	Total Incidence of Finding Observed:	1	0	0	0	0	0	0	2
Spleen	Number examined:	12	0	0	12	12	0	0	12
Sternal Marrow	Number examined:	12	0	0	12	12	0	0	12
Sternum	Number examined:	12	0	0	12	12	0	0	12
Stomach	Number examined:	12	0	0	12	12	0	0	12
Testes	Number examined:	12	0	0	12				
GERM CELL DEGENERATION/MULTINUCLEATE CELLS									
	Nad>	12	0	0	11				
	Minimal>	0	0	0	1				
.....	Total Incidence of Finding Observed:	0	0	0	1				
SERTOLI CELL VACUOLATION									
	Nad>	6	0	0	8				
	Minimal>	6	0	0	4				
.....	Total Incidence of Finding Observed:	6	0	0	4				
Thoracic SC	Number examined:	12	0	0	12	11	0	0	12

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Controls from group(s): 1	Animal sex:	-- Animals Affected -- Males --				-- Females --			
	Dosage group:	Ctls	2	3	4	Ctls	2	3	4
Tissues With Diagnoses	No. in group:	12	12	12	12	12	12	12	12
Thymus	Number examined:	12	0	0	12	12	0	0	12
INVOLUTION/CORTICAL LYMPHOCYTOSIS									
	Nad>	0	0	0	1	0	0	0	0
	Minimal>	12	0	0	11	12	0	0	12
.....	Total Incidence of Finding Observed:	12	0	0	11	12	0	0	12
HEMORRHAGE									
	Nad>	2	0	0	2	11	0	0	6
	Minimal>	10	0	0	10	1	0	0	6
.....	Total Incidence of Finding Observed:	10	0	0	10	1	0	0	6
LYMPHOCYTIC HYPERPLASIA									
	Nad>	12	0	0	11	12	0	0	12
	Slight>	0	0	0	1	0	0	0	0
.....	Total Incidence of Finding Observed:	0	0	0	1	0	0	0	0
MEDULLA/HASSALL'S CORPUSCLE: CELLULAR NECROSIS/DEBRIS									
	Nad>	12	0	0	12	10	0	0	12
	Minimal>	0	0	0	0	2	0	0	0
.....	Total Incidence of Finding Observed:	0	0	0	0	2	0	0	0
Thyroid	Number examined:	12	0	0	11	11	0	0	12
THYMIC ECTOPIC TISSUE									
	Nad>	12	0	0	11	11	0	0	9
	Minimal>	0	0	0	0	0	0	0	3
.....	Total Incidence of Finding Observed:	0	0	0	0	0	0	0	3
ULTIMOBRANCHIAL REST(S)									
	Nad>	11	0	0	10	10	0	0	6
	Minimal>	1	0	0	1	1	0	0	5
	Slight>	0	0	0	0	0	0	0	1
.....	Total Incidence of Finding Observed:	1	0	0	1	1	0	0	6
Tibial Nerve	Number examined:	12	0	0	11	11	0	0	12

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Controls from group(s): 1	Animal sex:	-- Animals Affected -- Males --				-- Animals Affected -- Females --			
	Dosage group:	Ctls	2	3	4	Ctls	2	3	4
Tissues With Diagnoses	No. in group:	12	12	12	12	12	12	12	12
Trachea .....Number examined:		12	0	0	12	12	0	0	11
SUBACUTE/CHRONIC INFLAMMATORY CELL INFILTRATE									
	Nad>	10	0	0	12	12	0	0	10
	Minimal>	2	0	0	0	0	0	0	1
.....Total Incidence of Finding	Observed:	2	0	0	0	0	0	0	1
Urinary bladder .....Number examined:		12	0	0	11	12	0	0	11
Uterus .....Number examined:						12	0	0	12
LUMINAL DILATATION									
	Nad>					8	0	0	7
	Minimal>					0	0	0	2
	Slight>					1	0	0	0
	Moderate>					3	0	0	3
.....Total Incidence of Finding	Observed:					4	0	0	5
Vagina .....Number examined:						12	0	0	12

All Diagnoses; Phases: P2; Death types: Scheduled FS; Date of death range: 17-Feb-04 To 18-Feb-04

TABLE 13

PROPANE: COMBINED REPEATED-EXPOSURE TOXICITY, REPRODUCTION AND NEUROTOXICITY SCREENING IN RATS VIA WHOLE-BODY INHALATION EXPOSURES

SUMMARY OF SURVIVAL AND PREGNANCY

DOSE GROUP:		1	2	3	4
DOSE LEVEL (PPM):		0	1200	4000	12000
No. of males at start	N	12	12	12	12
Premating					
- Died/sacrificed	N	0	0	0	0
Postmating					
- Died/sacrificed	N	0	0	0	0
No. of females cohabitated	N	12	12	12	12
- Without evidence of mating	N	0	1	0	0
Pregnant	N	0	0	0	0
Nonpregnant	N	0	1	0	0
Pregnant	N	12	11	12	12
- Died/sacrificed	N	0	0	0	0
- Died delivering	N	0	0	0	0
- Died/sacrificed post partum	N	0	0	0	0
- Aborted died/sacrificed	N	0	0	0	0
Nonpregnant	N	0	1	0	0
- Died/sacrificed	N	0	0	0	0
Total females died/sacrificed	N	0	0	0	0
	%	0.0	0.0	0.0	0.0
Dams delivering	N	12	11	12	12
- With liveborn pups	N	12	11	12	12
	%	100.0	100.0	100.0	100.0
- With all pups dead	N	0	0	0	0
	%	0.0	0.0	0.0	0.0

No statistically significant differences

	Summary of Weekly Clinical Observations Satellite Study Preface	Table 14

Number of animals examined represents the total number of animals observed and animals which were killed at a scheduled sacrifice for a given interval. After Day 15, observations of pregnant animals are reported on Table 15.

Total represents a cumulative total of all animals with the indicated observation one or more times during the study.

Corresponding exposure levels for each group were as follows:

Group 1 - 0 ppm
Group 2 - 1200 ppm
Group 3 - 4000 ppm
Group 4 - 12000 ppm

TABLE 14

PROPANE: COMBINED REPEATED-EXPOSURE TOXICITY, REPRODUCTION AND NEUROTOXICITY SCREENING IN RATS VIA WHOLE-BODY INHALATION EXPOSURES

FEMALES — SUMMARY OF WEEKLY CLINICAL OBSERVATIONS

		DAY OF STUDY										
	GROUP#	-7	0	8	15	22	28	36	43	50	54	TOTAL
# OF ANIMALS EXAMINED	I	12	12	12	9	0	0	0	0	0	0	
	II	12	12	12	9	2	1	1	1	1	1	
	III	12	12	12	8	0	0	0	0	0	0	
	IV	12	12	12	9	0	0	0	0	0	0	
Normal												
WITHIN NORMAL LIMITS	I	12	12	12	9	0	0	0	0	0	0	12
	II	12	12	12	9	1	1	1	1	1	1	12
	III	12	12	12	8	0	0	0	0	0	0	12
	IV	12	12	12	9	0	0	0	0	0	0	12
Dead												
TERMINAL SACRIFICE	I	0	0	0	0	0	0	0	0	0	0	0
	II	0	0	0	0	0	0	0	0	0	1	1
	III	0	0	0	0	0	0	0	0	0	0	0
	IV	0	0	0	0	0	0	0	0	0	0	0
Dermal-General												
RED STAINS	I	0	0	0	0	0	0	0	0	0	0	0
EXTREMITIES/SNOUT	II	0	0	0	0	1	0	0	0	0	0	1
	III	0	0	0	0	0	0	0	0	0	0	0
	IV	0	0	0	0	0	0	0	0	0	0	0

TABLE 15

PROPANE: COMBINED REPEATED-EXPOSURE TOXICITY, REPRODUCTION AND NEUROTOXICITY SCREENING IN RATS VIA WHOLE-BODY INHALATION EXPOSURES

SUMMARY OF CLINICAL OBSERVATIONS DURING GESTATION - (frequency/animals)

DOSE GROUP:	1	2	3	4
DOSE LEVEL (PPM):	0	1200	4000	12000
DAY 0 to 20				
Normal				
WITHIN NORMAL LIMITS	47/12	44/11	44/12	45/12
Dermal-General				
ALOPECIA - EXTREMITIES/SNOUT	1/ 1	0/ 0	4/ 2	3/ 1

TABLE 16

PROPANE: COMBINED REPEATED-EXPOSURE TOXICITY, REPRODUCTION
AND NEUROTOXICITY SCREENING IN RATS VIA WHOLE-BODY
INHALATION EXPOSURES

SUMMARY OF MATERNAL CLINICAL OBSERVATIONS DURING LACTATION - (frequency/animals)

DOSE GROUP:	1	2	3	4
DOSE LEVEL (PPM):	0	1200	4000	12000
DAY 0 to 4				
Normal				
WITHIN NORMAL LIMITS	30/11	29/11	31/11	26/10
TERMINAL SACRIFICE	12/12	11/11	12/12	12/12
Gen. Appearance				
RED EXUDATE FROM ANO-GENITAL AREA	1/ 1	0/ 0	0/ 0	0/ 0
Dermal-General				
ALOPECIA - EXTREMITIES/SNOUT	5/ 2	2/ 1	4/ 2	7/ 3
ALOPECIA - GENERAL	0/ 0	1/ 1	0/ 0	0/ 0

TABLE 16

PROPANE: COMBINED REPEATED-EXPOSURE TOXICITY, REPRODUCTION
AND NEUROTOXICITY SCREENING IN RATS VIA WHOLE-BODY
INHALATION EXPOSURES

SUMMARY OF MATERNAL CLINICAL OBSERVATIONS DURING LACTATION - (frequency/animals)

DOSE GROUP:	1	2	3	4
DOSE LEVEL (PPM):	0	1200	4000	12000
DAY 0 to 4				
Normal				
WITHIN NORMAL LIMITS	30/11	29/11	31/11	26/10
TERMINAL SACRIFICE	12/12	11/11	12/12	12/12
Gen. Appearance				
RED EXUDATE FROM ANO-GENITAL AREA	1/ 1	0/ 0	0/ 0	0/ 0
Dermal-General				
ALOPECIA - EXTREMITIES/SNOUT	5/ 2	2/ 1	4/ 2	7/ 3
ALOPECIA - GENERAL	0/ 0	1/ 1	0/ 0	0/ 0

TABLE 17

PROPANE: COMBINED REPEATED-EXPOSURE TOXICITY, REPRODUCTION AND NEUROTOXICITY SCREENING IN RATS VIA WHOLE-BODY INHALATION EXPOSURES

FEMALES — MEAN BODY WEIGHT VALUES (GRAMS)

		DOSE GROUP:	1	2	3	4
		DOSE LEVEL (PPM):	0	1200	4000	12000
DAY	-7	MEAN	167	167	168	167
		S.D.	6.8	6.2	6.2	6.1
		N	12	12	12	12
DAY	0	MEAN	194	196	200	201
		S.D.	6.6	10.5	10.9	8.7
		N	12	12	12	12
DAY	4	MEAN	205	206	210	210
		S.D.	6.8	12.5	10.3	8.8
		N	12	12	12	12
DAY	7	MEAN	215	211	216	216
		S.D.	10.3	12.2	11.2	11.3
		N	12	12	12	12
DAY	11	MEAN	222	220	222	224
		S.D.	11.1	13.9	11.5	13.6
		N	12	12	12	12
DAY	14	MEAN	229	224	229	228
		S.D.	10.8	14.9	11.8	14.3
		N	12	12	12	12

No statistically significant differences

TABLE 18

PROPANE: COMBINED REPEATED-EXPOSURE TOXICITY, REPRODUCTION AND NEUROTOXICITY SCREENING IN RATS VIA WHOLE-BODY INHALATION EXPOSURES

FEMALES — MEAN BODY WEIGHT GAIN (GRAMS)

		DOSE GROUP:	1	2	3	4
		DOSE LEVEL (PPM):	0	1200	4000	12000
DAY	-7 TO 0	MEAN	27	29	32	34**
		S.D.	4.6	5.8	5.8	5.8
		N	12	12	12	12
DAY	0 TO 4	MEAN	11	10	10	8
		S.D.	6.6	5.4	3.6	2.8
		N	12	12	12	12
DAY	4 TO 7	MEAN	9	4	5	6
		S.D.	8.5	6.1	4.0	5.7
		N	12	12	12	12
DAY	7 TO 11	MEAN	7	9	6	9
		S.D.	4.2	3.1	4.1	4.5
		N	12	12	12	12
DAY	11 TO 14	MEAN	7	4	7	4
		S.D.	7.2	5.0	4.5	4.7
		N	12	12	12	12
DAY	0 TO 14	MEAN	34	28	29	27
		S.D.	10.0	9.8	5.8	8.0
		N	12	12	12	12

Statistical key: ** = p<0.01

TABLE 19

PROPANE: COMBINED REPEATED-EXPOSURE TOXICITY, REPRODUCTION AND NEUROTOXICITY SCREENING IN RATS VIA WHOLE-BODY INHALATION EXPOSURES

SUMMARY OF GESTATION BODY WEIGHTS (GRAMS)

DOSE GROUP:		1	2	3	4
DOSE LEVEL (PPM):		0	1200	4000	12000
DAY 0	MEAN	238	235	234	236
	S.D.	11.2	20.7	12.7	14.4
	N	12	11	12	12
DAY 7	MEAN	272	267	269	273
	S.D.	14.4	24.8	16.6	17.3
	N	12	11	12	12
DAY 14	MEAN	303	301	303	305
	S.D.	15.6	30.2	22.5	20.4
	N	12	11	12	12
DAY 20	MEAN	372	376	366	373
	S.D.	22.5	34.9	33.9	32.2
	N	12	11	12	12

No statistically significant differences

TABLE 20

PROPANE: COMBINED REPEATED-EXPOSURE TOXICITY, REPRODUCTION AND NEUROTOXICITY SCREENING IN RATS VIA WHOLE-BODY INHALATION EXPOSURES

SUMMARY OF GESTATION BODY WEIGHT GAIN (GRAMS)

DOSE GROUP:		1	2	3	4
DOSE LEVEL (PPM):		0	1200	4000	12000
DAYS 0 TO 7	MEAN	35	32	35	37
	S.D.	7.5	7.6	6.7	5.4
	N	12	11	12	12
DAYS 7 TO 14	MEAN	30	34	34	32
	S.D.	6.0	7.1	7.5	4.7
	N	12	11	12	12
DAYS 14 TO 20	MEAN	69	75	63	68
	S.D.	12.0	9.7	23.5	19.5
	N	12	11	12	12
DAYS 0 TO 20	MEAN	134	142	132	137
	S.D.	16.0	19.5	28.2	22.1
	N	12	11	12	12

No statistically significant differences

TABLE 21

PROPANE: COMBINED REPEATED-EXPOSURE TOXICITY, REPRODUCTION AND NEUROTOXICITY SCREENING IN RATS VIA WHOLE-BODY INHALATION EXPOSURES

SUMMARY OF MATERNAL LACTATION BODY WEIGHTS (GRAMS)

DOSE GROUP:		1	2	3	4
DOSE LEVEL (PPM):		0	1200	4000	12000
DAY 1	MEAN	280	278	281	284
	S.D.	19.1	26.1	24.3	18.6
	N	12	11	11	11
DAY 4	MEAN	293	298	286	293
	S.D.	16.7	26.5	33.1	24.7
	N	12	11	11	11

No statistically significant differences

TABLE 22

PROPANE: COMBINED REPEATED-EXPOSURE TOXICITY, REPRODUCTION AND NEUROTOXICITY SCREENING IN RATS VIA WHOLE-BODY INHALATION EXPOSURES

SUMMARY OF MATERNAL LACTATION BODY WEIGHT GAIN (GRAMS)

DOSE GROUP:		1	2	3	4
DOSE LEVEL (PPM):		0	1200	4000	12000
DAYS 1 TO 4	MEAN	13	20	5	10
	S.D.	9.4	4.5	19.5	24.7
	N	12	11	11	11

No statistically significant differences

TABLE 23

PROPANE: COMBINED REPEATED-EXPOSURE TOXICITY, REPRODUCTION AND NEUROTOXICITY SCREENING IN RATS VIA WHOLE-BODY INHALATION EXPOSURES

FEMALES — MEAN FEED CONSUMPTION (GRAMS/KG/DAY)

	DOSE GROUP:	1	2	3	4
	DOSE LEVEL (PPM):	0	1200	4000	12000
DAY 0	MEAN	91	94	95	97**
	S.D.	3.8	5.5	5.7	5.2
	N	11	12	12	12
DAY 7	MEAN	79	78	79	80
	S.D.	5.0	4.7	4.2	3.2
	N	11	12	12	12
DAY 14	MEAN	76	78	77	78
	S.D.	3.3	5.2	3.6	3.9
	N	12	12	12	12

Statistical key: ** = p<0.01

TABLE 24

PROPANE: COMBINED REPEATED-EXPOSURE TOXICITY, REPRODUCTION AND NEUROTOXICITY SCREENING IN RATS VIA WHOLE-BODY INHALATION EXPOSURES

SUMMARY OF GESTATION FEED CONSUMPTION (GRAMS/KG/DAY)

DOSE GROUP:		1	2	3	4
DOSE LEVEL (PPM):		0	1200	4000	12000
DAYS 0 TO 7	MEAN	81	83	83	85
	S.D.	4.8	5.6	4.0	4.4
	N	12	11	12	12
DAYS 7 TO 14	MEAN	75	80	78	79
	S.D.	2.3	5.4	5.8	5.2
	N	12	11	12	12
DAYS 14 TO 20	MEAN	68	70	68	70
	S.D.	4.0	3.1	3.6	4.4
	N	12	11	12	11
DAYS 0 TO 20	MEAN	75	77	76	78
	S.D.	2.2	4.2	3.8	4.1
	N	12	11	12	12

No statistically significant differences

TABLE 25

PROPANE: COMBINED REPEATED-EXPOSURE TOXICITY, REPRODUCTION AND NEUROTOXICITY SCREENING IN RATS VIA WHOLE-BODY INHALATION EXPOSURES

SUMMARY OF LACTATION FEED CONSUMPTION (GRAMS/KG/DAY)

DOSE GROUP:		1	2	3	4
DOSE LEVEL (PPM):		0	1200	4000	12000
DAYS 1 TO 4	MEAN	120	132	104	117
	S.D.	28.7	20.8	16.5	20.4
	N	12	11	11	11

No statistically significant differences

TABLE 26

PROPANE: COMBINED REPEATED-EXPOSURE TOXICITY, REPRODUCTION AND NEUROTOXICITY SCREENING IN RATS VIA WHOLE-BODY INHALATION EXPOSURES

SUMMARY OF COHABITATION DATA

DOSE GROUP:		1	2	3	4
DOSE LEVEL (PPM):		0	1200	4000	12000
Females paired with males	N	12	12	12	12
Total number mated	N	12	11	12	12
female mating index	%	100.0	91.7	100.0	100.0
pregnant	N	12	11	12	12
female fertility index	%	100.0	91.7	100.0	100.0
pregnancy index	%	100.0	100.0	100.0	100.0
Males placed with females	N	12	12	12	12
Total number mated	N	12	11	12	12
male mating index	%	100.0	91.7	100.0	100.0
with females pregnant	N	12	11	12	12
male fertility index	%	100.0	100.0	100.0	100.0
Females with defined day 0 of Gestation	N	12	11	12	12
No. of days until Mating	MEAN	2.8	4.0	2.4	2.8
	S.D.	1.29	3.79	1.24	1.27
Day 1 to 4	N	12	9	12	12
	%	100.0	81.8	100.0	100.0
Day 5 to 8	N	0	1	0	0
	%	0.0	9.1	0.0	0.0
Day 9 to 14	N	0	1	0	0
	%	0.0	9.1	0.0	0.0

No statistically significant differences

TABLE 27

PROPANE: COMBINED REPEATED-EXPOSURE TOXICITY, REPRODUCTION AND NEUROTOXICITY SCREENING IN RATS VIA WHOLE-BODY INHALATION EXPOSURES

SUMMARY OF DELIVERY AND LITTER DATA

DOSE GROUP:		1	2	3	4
DOSE LEVEL (PPM):		0	1200	4000	12000
Females on Study	N	12	12	12	12
Females Mated	N	12	11	12	12
Mating Index	%	100.0	91.7	100.0	100.0
Females Pregnant	N	12	11	12	12
Female Fertility Index	%	100.0	100.0	100.0	100.0
Females with Liveborn	N	12	11	12	12
Gestation Index	%	100.0	100.0	100.0	100.0
Females Completing Delivery	N	12	11	12	12
	%	100.0	100.0	100.0	100.0
with Stillborn Pups	N	0	0	1	3
	%	0.0	0.0	8.3	25.0
with all Stillborn	N	0	0	0	0
	%	0.0	0.0	0.0	0.0
Litters with Liveborn, but no Pups Alive					
day 4	N	0	0	1	1
	%	0.0	0.0	8.3	8.3
Duration of Gestation	MEAN	21.8	21.9	21.7	21.6
	S.D.	0.39	0.30	0.49	0.51
	N	12	11	12	12

No statistically significant differences

TABLE 27

PROPANE: COMBINED REPEATED-EXPOSURE TOXICITY, REPRODUCTION AND NEUROTOXICITY SCREENING IN RATS VIA WHOLE-BODY INHALATION EXPOSURES

SUMMARY OF DELIVERY AND LITTER DATA

DOSE GROUP:		1	2	3	4
DOSE LEVEL (PPM):		0	1200	4000	12000
Litters with Liveborn Pups	N	12	11	12	12
Pups Delivered (total)	N	165	167	161	177
	MEAN	13.8	15.2	13.4	14.8
	S.D.	2.05	1.66	3.00	1.60
Liveborn	N	165	167	148**	161**
Live Birth Index	%	100.0	100.0	91.9	91.0
Stillborn	N	0	0	13**	16**
	%	0.0	0.0	8.1	9.0
Liveborn, not culled prior to day 4	N	165	167	148	161
Pups Dying, Missing, and/or Cannibalized					
day 0	N	0	0	4	2
	%	0.0	0.0	2.7	1.2
days 1-4	N	2	1	4	1
	%	1.2	0.6	2.7	0.6
Pups Surviving 4 days	N	163	166	140	158
Viability Index	%	98.8	99.4	94.6	98.1

Statistical key: ** = p<0.01

TABLE 27

PROPANE: COMBINED REPEATED-EXPOSURE TOXICITY, REPRODUCTION AND NEUROTOXICITY SCREENING IN RATS VIA WHOLE-BODY INHALATION EXPOSURES

SUMMARY OF DELIVERY AND LITTER DATA

DOSE GROUP:		1	2	3	4
DOSE LEVEL (PPM):		0	1200	4000	12000
Implantation Sites	N	172	171	173	186
per Litter	MEAN	14.3	15.5	14.4	15.5
	S.D.	2.06	1.81	3.20	1.57
Corpora Lutea	TOTAL	180	178	188	190
	MEAN	15.0	16.2	15.7	15.8
	S.D.	1.65	2.18	2.19	1.64
Preimplantation Loss	MEAN	0.7	0.6	1.3	0.3
	S.D.	0.8	0.8	2.5	0.7
Postimplantation Loss	MEAN	0.6	0.4	2.1	2.1
	S.D.	0.9	0.7	4.2	3.6
Live Pups/Litter					
day 0	MEAN	13.8	15.2	12.3	13.4
	S.D.	2.05	1.66	3.82	3.80
	N	12	11	12	12
day 1	MEAN	13.6	15.2	12.7	14.5
	S.D.	2.07	1.66	2.76	1.29
	N	12	11	11	11
day 4	MEAN	13.6	15.1	12.7	14.4
	S.D.	2.07	1.64	2.76	1.29
	N	12	11	11	11
Sex Ratio - Male Pups:Total Pups					
day 0	N	83	80	73	77
	%	50.3	47.9	49.7	47.8
day 4	N	81	80	70	74
	%	49.7	48.2	50.0	46.8

No statistically significant differences

	Incidence Summary Report for Gross Necropsy Observations Preface	Table 28

Corresponding exposure levels for each group were as follows:

Group 1 - 0 ppm
Group 2 - 1200 ppm
Group 3 - 4000 ppm
Group 4 - 12000 ppm

Huntingdon Life Sciences
Princeton Research Center
East Millstone, New Jersey
Table 28 - Satellite Study

Incidence Summary Report for Gross Necropsy Observations
Study number: 034245

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	-- Females --			
Group:	1	2	3	4
Number in group:	12	12	12	12
Within normal limits	9	12	12	11
Liver				
Extra lobe	1	0	0	1
Urinary bladder				
Calculus	1	0	0	0
Skin (other)				
Hair Thin/Absent	1	0	0	0

	Mean Organ Weights Satellite Study Preface	Table 29

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Absolute Organ Weights 139
% Organ to Body Weight Ratios 141
% Organ to Brain Weight Ratios 143

Key to Abbreviations:

g = Grams
wt. = Weight
observ. = Observed

Corresponding exposure levels for each group were as follows:

Group 1 - 0 ppm
Group 2 - 1200 ppm
Group 3 - 4000 ppm
Group 4 - 12000 ppm

Huntingdon Life Sciences
Princeton Research Center
East Millstone, New Jersey

Summary statistics for absolute organ weights (g)
Study number: 034245

Printed: 07-Jul-04
Page: 1
Version 4.2.2

Table 29 - Satellite Study

Group	Terminal Body wt. (g)	Adrenal Glands	Brain	Heart	Kidneys	Liver	Lungs	Ovary Left
				Female Animals				
1								
Mean:	290.5	0.0881	2.0612	1.0288	2.4582	14.3153	1.4634	0.0724
Standard deviation:	17.9	0.0161	0.0678	0.0736	0.2707	1.4757	0.2305	0.0115
Number of observ. :	(12)	(12)	(12)	(12)	(12)	(12)	(12)	(12)
2								
Mean:	298.3	0.0872	2.0390	1.0182	2.3926	14.2951	1.5348	0.0735
Standard deviation:	26.5	0.0153	0.1081	0.1261	0.2669	1.1810	0.2903	0.0150
Number of observ. :	(11)	(11)	(11)	(11)	(11)	(11)	(11)	(11)
3								
Mean:	284.7	0.0863	2.0653	0.9796	2.3572	13.0129	1.5670	0.0749
Standard deviation:	31.7	0.0109	0.1308	0.0928	0.2408	1.5457	0.2277	0.0124
Number of observ. :	(12)	(12)	(12)	(12)	(12)	(12)	(12)	(12)
4								
Mean:	288.9	0.0847	2.0795	1.0515	2.3974	13.5544	1.5781	0.0748
Standard deviation:	28.0	0.0103	0.1356	0.1498	0.2522	2.2096	0.1730	0.0113
Number of observ. :	(12)	(12)	(12)	(12)	(12)	(12)	(12)	(12)

*(+) = mean value of group was significantly different from control at P = 0.05(0.01) with Dunnett's test of significance
%($) = mean value of group was significantly different from control at P = 0.05(0.01) with Modified T test of significance

Huntingdon Life Sciences
Princeton Research Center
East Millstone, New Jersey

Summary statistics for absolute organ weights (g)
Study number: 034245

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Table 29 - Satellite Study

Group	Terminal Body wt. (g)	Ovary Right	Spleen	Thymus	Uterus w/vagina
			Female Animals		
1					
Mean:	290.5	0.0759	0.6440	0.3013	1.0003
Standard deviation:	17.9	0.0100	0.0668	0.0897	0.1597
Number of observ. :	(12)	(12)	(12)	(12)	(12)
2					
Mean:	298.3	0.0711	0.6681	0.2627	0.9916
Standard deviation:	26.5	0.0165	0.1348	0.0354	0.1935
Number of observ. :	(11)	(11)	(11)	(11)	(11)
3					
Mean:	284.7	0.0682	0.6410	0.2631	0.9658
Standard deviation:	31.7	0.0123	0.0945	0.0943	0.1270
Number of observ. :	(12)	(12)	(12)	(12)	(12)
4					
Mean:	288.9	0.0750	0.6426	0.2765	1.0335
Standard deviation:	28.0	0.0094	0.1070	0.0939	0.1213
Number of observ. :	(12)	(12)	(12)	(12)	(12)

*(+) = mean value of group was significantly different from control at P = 0.05(0.01) with Dunnett's test of significance
%($) = mean value of group was significantly different from control at P = 0.05(0.01) with Modified T test of significance

Huntingdon Life Sciences
Princeton Research Center
East Millstone, New Jersey

Summary Statistics for % Organ to Body Weight
Study number: 034245

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Table 29 - Satellite Study

Group	Terminal Body wt. (g)	Adrenal Glands	Brain	Heart	Kidneys	Liver	Lungs	Ovary Left
				Female Animals				
1								
Mean:	290.5	0.0302	0.7119	0.3543	0.8474	4.9355	0.5052	0.0249
Standard deviation:	17.9	0.0041	0.0478	0.0179	0.0912	0.5091	0.0838	0.0032
Number of observ. :	(12)	(12)	(12)	(12)	(12)	(12)	(12)	(12)
2								
Mean:	298.3	0.0293	0.6869	0.3420	0.8066	4.8092	0.5141	0.0248
Standard deviation:	26.5	0.0051	0.0524	0.0387	0.1027	0.3989	0.0775	0.0055
Number of observ. :	(11)	(11)	(11)	(11)	(11)	(11)	(11)	(11)
3								
Mean:	284.7	0.0307	0.7321	0.3460	0.8324	4.5778	0.5555	0.0265
Standard deviation:	31.7	0.0052	0.0778	0.0306	0.0764	0.3053	0.0906	0.0049
Number of observ. :	(12)	(12)	(12)	(12)	(12)	(12)	(12)	(12)
4								
Mean:	288.9	0.0297	0.7249	0.3640	0.8313	4.6765	0.5495	0.0260
Standard deviation:	28.0	0.0050	0.0725	0.0410	0.0587	0.4771	0.0665	0.0037
Number of observ. :	(12)	(12)	(12)	(12)	(12)	(12)	(12)	(12)

*(+) = mean value of group was significantly different from control at P = 0.05(0.01) with Dunnett's test of significance
%($) = mean value of group was significantly different from control at P = 0.05(0.01) with Modified T test of significance

Huntingdon Life Sciences
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Table 29 - Satellite Study

Summary Statistics for % Organ to Body Weight
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Group	Terminal Body wt. (g)	Ovary Right	Spleen	Uterus w/vagina Thymus	
			Female Animals		
1					
Mean:	290.5	0.0261	0.2218	0.1028	0.3452
Standard deviation:	17.9	0.0029	0.0198	0.0277	0.0550
Number of observ. :	(12)	(12)	(12)	(12)	(12)
2					
Mean:	298.3	0.0239	0.2251	0.0881	0.3327
Standard deviation:	26.5	0.0056	0.0429	0.0089	0.0597
Number of observ. :	(11)	(11)	(11)	(11)	(11)
3					
Mean:	284.7	0.0243	0.2249	0.0919	0.3425
Standard deviation:	31.7	0.0058	0.0186	0.0288	0.0541
Number of observ. :	(12)	(12)	(12)	(12)	(12)
4					
Mean:	288.9	0.0263	0.2225	0.0943	0.3590
Standard deviation:	28.0	0.0052	0.0326	0.0284	0.0391
Number of observ. :	(12)	(12)	(12)	(12)	(12)

*(+) = mean value of group was significantly different from control at P = 0.05(0.01) with Dunnett's test of significance
%($) = mean value of group was significantly different from control at P = 0.05(0.01) with Modified T test of significance

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Table 29 - Satellite Study

Summary Statistics for % Organ to Brain Weight
Study number: 034245

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Group	Terminal Body wt. (g)	Adrenal Glands	Heart	Kidneys	Liver	Lungs	Ovary Left	Ovary Right
				Female Animals				
1								
Mean:	290.5	4.2726	49.9509	119.2074	694.1763	70.8553	3.5167	3.6757
Standard deviation:	17.9	0.7871	3.7231	11.9550	63.9599	9.5338	0.5668	0.4238
Number of observ. :	(12)	(12)	(12)	(12)	(12)	(12)	(12)	(12)
2								
Mean:	298.3	4.2709	49.8511	117.3442	701.2064	75.0343	3.5956	3.4759
Standard deviation:	26.5	0.6984	4.7851	11.2019	47.8501	11.5091	0.6591	0.7329
Number of observ. :	(11)	(11)	(11)	(11)	(11)	(11)	(11)	(11)
3								
Mean:	284.7	4.1905	47.4213	114.3649	629.6125	75.8730	3.6340	3.3032
Standard deviation:	31.7	0.5630	3.1304	11.9504	59.1330	9.6814	0.6173	0.5754
Number of observ. :	(12)	(12)	(12)	(12)	(12)	(12)	(12)	(12)
4								
Mean:	288.9	4.0885	50.6076	115.3185	651.2126	76.0516	3.6078	3.6225
Standard deviation:	28.0	0.5511	7.1123	9.7272	92.8281	8.6603	0.5727	0.5325
Number of observ. :	(12)	(12)	(12)	(12)	(12)	(12)	(12)	(12)

*(+) = mean value of group was significantly different from control at P = 0.05(0.01) with Dunnett's test of significance
%($) = mean value of group was significantly different from control at P = 0.05(0.01) with Modified T test of significance

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Table 29 - Satellite Study

Summary Statistics for % Organ to Brain Weight
Study number: 034245

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Group	Terminal Body wt. (g)	Spleen	Thymus	Uterus w/vagina
			Female Animals	
1				
Mean:	290.5	31.2734	14.5951	48.5131
Standard deviation:	17.9	3.4236	4.2730	7.3355
Number of observ. :	(12)	(12)	(12)	(12)
2				
Mean:	298.3	32.7665	12.8709	48.4602
Standard deviation:	26.5	6.2269	1.4097	7.9133
Number of observ. :	(11)	(11)	(11)	(11)
3				
Mean:	284.7	30.9788	12.5956	46.7614
Standard deviation:	31.7	3.6967	3.9392	5.5843
Number of observ. :	(12)	(12)	(12)	(12)
4				
Mean:	288.9	30.9576	13.2806	49.7150
Standard deviation:	28.0	5.2960	4.5853	5.1607
Number of observ. :	(12)	(12)	(12)	(12)

*(+) = mean value of group was significantly different from control at P = 0.05(0.01) with Dunnett's test of significance
%($) = mean value of group was significantly different from control at P = 0.05(0.01) with Modified T test of significance

TABLE 30

PROPANE: COMBINED REPEATED-EXPOSURE TOXICITY, REPRODUCTION
AND NEUROTOXICITY SCREENING IN RATS VIA WHOLE-BODY
INHALATION EXPOSURES

SUMMARY OF PUP CLINICAL OBSERVATIONS DURING LACTATION - (frequency/animals)

DOSE GROUP:	1	2	3	4
DOSE LEVEL (PPM):	0	1200	4000	12000
DAY 0 to 4				
Normal				
WITHIN NORMAL LIMITS	326/12	333/11	283/11	317/11
Gen. Appearance				
MISSING TAIL	2/ 1	0/ 0	0/ 0	0/ 0
Dermal-General				
BLACK SUBCUTANEOUS DISCOLORATION	0/ 0	0/ 0	1/ 1	0/ 0

TABLE 31

PROPANE: COMBINED REPEATED-EXPOSURE TOXICITY, REPRODUCTION AND NEUROTOXICITY SCREENING IN RATS VIA WHOLE-BODY INHALATION EXPOSURES

SUMMARY OF MEAN PUP BODY WEIGHTS (GRAMS)

			DOSE GROUP:	1	2	3	4
			DOSE LEVEL (PPM):	0	1200	4000	12000
day	1	males	MEAN	7.5	7.3	7.2	7.1
			S.D.	0.63	0.48	0.80	0.57
			N	12	11	11	11
	1	females	MEAN	7.2	6.9	6.8	6.6
			S.D.	0.59	0.53	0.80	0.50
			N	12	11	11	11
	1	males+females	MEAN	7.4	7.1	7.0	6.8
			S.D.	0.61	0.53	0.73	0.55
			N	12	11	11	11
day	4	males	MEAN	10.7	10.4	10.4	10.0
			S.D.	0.96	0.87	1.32	0.58
			N	12	11	11	11
	4	females	MEAN	10.2	9.9	9.7	9.5
			S.D.	1.00	0.91	1.20	0.59
			N	12	11	11	11
	4	males+females	MEAN	10.4	10.1	10.1	9.8
			S.D.	0.97	0.92	1.19	0.57
			N	12	11	11	11

No statistically significant differences

TABLE 32

PROPANE: COMBINED REPEATED-EXPOSURE TOXICITY, REPRODUCTION
AND NEUROTOXICITY SCREENING IN RATS VIA WHOLE-BODY
INHALATION EXPOSURES

SUMMARY OF PUP BODY WEIGHT GAIN -- GRAMS

DOSE GROUP:		1	2	3	4
DOSE LEVEL (PPM):		0	1200	4000	12000
day 1- 4 males	MEAN	3.1	3.1	3.2	2.9
	S.D.	0.42	0.54	0.83	0.43
	N	12	11	11	11
females	MEAN	3.0	3.0	2.9	2.9
	S.D.	0.52	0.52	0.67	0.43
	N	12	11	11	11
males+females	MEAN	3.1	3.1	3.1	2.9
	S.D.	0.46	0.53	0.74	0.42
	N	12	11	11	11

No statistically significant differences

	Summary of Pup Necropsy Observations Satellite Study Preface	Table 33

Notes:

1. From the litter of Dam No. 4524, the number of stillborn pups evaluated for Group 4 excludes pup No. 2 and pup Nos. 5-10, but includes three cannibalized pup Nos. 11-13 (of the 9 pups presented). See protocol deviation # 2.

2. External examinations are presented in the individual pup necropsy observations but are not summarized in this table.

TABLE 33

PROPANE: COMBINED REPEATED-EXPOSURE TOXICITY, REPRODUCTION AND NEUROTOXICITY SCREENING IN RATS VIA WHOLE-BODY INHALATION EXPOSURES

SUMMARY OF PUP NECROPSY OBSERVATIONS

DOSE GROUP:		1	2	3	4
DOSE LEVEL (PPM):		0	1200	4000	12000
Litters Evaluated	N	12	11	12	12
Pups Evaluated	N	164	166	158	177
Live	N	164	166	145	161
Stillborn	N	0	0	13	16
GROSS EXAM					
Litter Incidence	N	0	0	1	1
Pup Incidence	N	0	0	10	4
AUTOLYSIS					
Pup Incidence	N	0	0	0	1
	%	0.0	0.0	0.0	0.6
Litter Incidence	N	0	0	0	1
	%	0.0	0.0	0.0	8.3
CANNIBALIZED					
Pup Incidence	N	0	0	10	3
	%	0.0	0.0	6.3	1.7
Litter Incidence	N	0	0	1	1
	%	0.0	0.0	8.3	8.3
LUNGS					
Litter Incidence	N	1	0	2	4
Pup Incidence	N	1	0	10	8
LUNG FLOATATION TEST- FOUND DEAD					
Pup Incidence	N	1	0	5	3
	%	0.6	0.0	3.2	1.7
Litter Incidence	N	1	0	2	2
	%	8.3	0.0	16.7	16.7

No statistically significant differences

TABLE 33

PROPANE: COMBINED REPEATED-EXPOSURE TOXICITY, REPRODUCTION AND NEUROTOXICITY SCREENING IN RATS VIA WHOLE-BODY INHALATION EXPOSURES

SUMMARY OF PUP NECROPSY OBSERVATIONS

DOSE GROUP:		1	2	3	4
DOSE LEVEL (PPM):		0	1200	4000	12000
Litters Evaluated	N	12	11	12	12
Pups Evaluated	N	164	166	158	177
Live	N	164	166	145	161
Stillborn	N	0	0	13	16
LUNG FLOATATION TEST- STILLBORN					
Pup Incidence	N	0	0	5	5
	%	0.0	0.0	3.2	2.8
Litter Incidence	N	0	0	1	2
	%	0.0	0.0	8.3	16.7
STOMACH					
Litter Incidence	N	1	0	2	4
Pup Incidence	N	1	0	14	8
MILK IN STOMACH					
Pup Incidence	N	1	0	1	3
	%	0.6	0.0	0.6	1.7
Litter Incidence	N	1	0	1	2
	%	8.3	0.0	8.3	16.7
NO MILK IN STOMACH					
Pup Incidence	N	0	0	13	5
	%	0.0	0.0	8.2	2.8
Litter Incidence	N	0	0	1	2
	%	0.0	0.0	8.3	16.7

No statistically significant differences

APPENDIX A

PROPANE: COMBINED REPEATED-EXPOSURE TOXICITY, REPRODUCTION
AND NEUROTOXICITY SCREENING IN RATS VIA WHOLE-BODY
INHALATION EXPOSURES

INDIVIDUAL ANIMAL TERMINATION HISTORY

MALES GROUP 1 0 PPM

ANIMAL#	TYPE OF DEATH	DATE OF DEATH	STUDY DAY
1001	TERMINAL SACRIFICE	17-FEB-04	29
1002	TERMINAL SACRIFICE	17-FEB-04	29
1003	TERMINAL SACRIFICE	17-FEB-04	29
1004	TERMINAL SACRIFICE	17-FEB-04	29
1005	TERMINAL SACRIFICE	17-FEB-04	29
1006	TERMINAL SACRIFICE	17-FEB-04	29
1007	TERMINAL SACRIFICE	18-FEB-04	30
1008	TERMINAL SACRIFICE	18-FEB-04	30
1009	TERMINAL SACRIFICE	18-FEB-04	30
1010	TERMINAL SACRIFICE	18-FEB-04	30
1011	TERMINAL SACRIFICE	18-FEB-04	30
1012	TERMINAL SACRIFICE	18-FEB-04	30

APPENDIX A

PROPANE: COMBINED REPEATED-EXPOSURE TOXICITY, REPRODUCTION
AND NEUROTOXICITY SCREENING IN RATS VIA WHOLE-BODY
INHALATION EXPOSURES

INDIVIDUAL ANIMAL TERMINATION HISTORY

MALES GROUP 2 1200 PPM

ANIMAL#	TYPE OF DEATH	DATE OF DEATH	STUDY DAY
2001	TERMINAL SACRIFICE	17-FEB-04	29
2002	TERMINAL SACRIFICE	17-FEB-04	29
2003	TERMINAL SACRIFICE	17-FEB-04	29
2004	TERMINAL SACRIFICE	17-FEB-04	29
2005	TERMINAL SACRIFICE	17-FEB-04	29
2006	TERMINAL SACRIFICE	17-FEB-04	29
2007	TERMINAL SACRIFICE	18-FEB-04	30
2008	TERMINAL SACRIFICE	18-FEB-04	30
2009	TERMINAL SACRIFICE	18-FEB-04	30
2010	TERMINAL SACRIFICE	18-FEB-04	30
2011	TERMINAL SACRIFICE	18-FEB-04	30
2012	TERMINAL SACRIFICE	18-FEB-04	30

APPENDIX A

PROPANE: COMBINED REPEATED-EXPOSURE TOXICITY, REPRODUCTION
AND NEUROTOXICITY SCREENING IN RATS VIA WHOLE-BODY
INHALATION EXPOSURES

INDIVIDUAL ANIMAL TERMINATION HISTORY

MALES GROUP 3 4000 PPM

ANIMAL#	TYPE OF DEATH	DATE OF DEATH	STUDY DAY
3001	TERMINAL SACRIFICE	17-FEB-04	29
3002	TERMINAL SACRIFICE	17-FEB-04	29
3003	TERMINAL SACRIFICE	17-FEB-04	29
3004	TERMINAL SACRIFICE	17-FEB-04	29
3005	TERMINAL SACRIFICE	17-FEB-04	29
3006	TERMINAL SACRIFICE	17-FEB-04	29
3007	TERMINAL SACRIFICE	18-FEB-04	30
3008	TERMINAL SACRIFICE	18-FEB-04	30
3009	TERMINAL SACRIFICE	18-FEB-04	30
3010	TERMINAL SACRIFICE	18-FEB-04	30
3011	TERMINAL SACRIFICE	18-FEB-04	30
3012	TERMINAL SACRIFICE	18-FEB-04	30

APPENDIX A

PROPANE: COMBINED REPEATED-EXPOSURE TOXICITY, REPRODUCTION
AND NEUROTOXICITY SCREENING IN RATS VIA WHOLE-BODY
INHALATION EXPOSURES

INDIVIDUAL ANIMAL TERMINATION HISTORY

MALES GROUP 4 12000 PPM

ANIMAL#	TYPE OF DEATH	DATE OF DEATH	STUDY DAY
4001	TERMINAL SACRIFICE	17-FEB-04	29
4002	TERMINAL SACRIFICE	17-FEB-04	29
4003	TERMINAL SACRIFICE	17-FEB-04	29
4004	TERMINAL SACRIFICE	17-FEB-04	29
4005	TERMINAL SACRIFICE	17-FEB-04	29
4006	TERMINAL SACRIFICE	17-FEB-04	29
4007	TERMINAL SACRIFICE	18-FEB-04	30
4008	TERMINAL SACRIFICE	18-FEB-04	30
4009	TERMINAL SACRIFICE	18-FEB-04	30
4010	TERMINAL SACRIFICE	18-FEB-04	30
4011	TERMINAL SACRIFICE	18-FEB-04	30
4012	TERMINAL SACRIFICE	18-FEB-04	30

APPENDIX A

PROPANE: COMBINED REPEATED-EXPOSURE TOXICITY, REPRODUCTION
AND NEUROTOXICITY SCREENING IN RATS VIA WHOLE-BODY
INHALATION EXPOSURES

INDIVIDUAL ANIMAL TERMINATION HISTORY

FEMALES GROUP 1 0 PPM

ANIMAL#	TYPE OF DEATH	DATE OF DEATH	STUDY DAY
1501	TERMINAL SACRIFICE	17-FEB-04	29
1502	TERMINAL SACRIFICE	17-FEB-04	29
1503	TERMINAL SACRIFICE	17-FEB-04	29
1504	TERMINAL SACRIFICE	17-FEB-04	29
1505	TERMINAL SACRIFICE	17-FEB-04	29
1506	TERMINAL SACRIFICE	17-FEB-04	29
1507	TERMINAL SACRIFICE	18-FEB-04	30
1508	TERMINAL SACRIFICE	18-FEB-04	30
1509	TERMINAL SACRIFICE	18-FEB-04	30
1510	TERMINAL SACRIFICE	18-FEB-04	30
1511	TERMINAL SACRIFICE	18-FEB-04	30
1512	TERMINAL SACRIFICE	18-FEB-04	30

APPENDIX A

PROPANE: COMBINED REPEATED-EXPOSURE TOXICITY, REPRODUCTION
AND NEUROTOXICITY SCREENING IN RATS VIA WHOLE-BODY
INHALATION EXPOSURES

INDIVIDUAL ANIMAL TERMINATION HISTORY

FEMALES GROUP 2 1200 PPM

ANIMAL#	TYPE OF DEATH	DATE OF DEATH	STUDY DAY
2501	TERMINAL SACRIFICE	17-FEB-04	29
2502	TERMINAL SACRIFICE	17-FEB-04	29
2503	TERMINAL SACRIFICE	17-FEB-04	29
2504	TERMINAL SACRIFICE	17-FEB-04	29
2505	TERMINAL SACRIFICE	17-FEB-04	29
2506	TERMINAL SACRIFICE	17-FEB-04	29
2507	TERMINAL SACRIFICE	18-FEB-04	30
2508	TERMINAL SACRIFICE	18-FEB-04	30
2509	TERMINAL SACRIFICE	18-FEB-04	30
2510	TERMINAL SACRIFICE	18-FEB-04	30
2511	TERMINAL SACRIFICE	18-FEB-04	30
2512	TERMINAL SACRIFICE	18-FEB-04	30

APPENDIX A

PROPANE: COMBINED REPEATED-EXPOSURE TOXICITY, REPRODUCTION
AND NEUROTOXICITY SCREENING IN RATS VIA WHOLE-BODY
INHALATION EXPOSURES

INDIVIDUAL ANIMAL TERMINATION HISTORY

FEMALES GROUP 3 4000 PPM

ANIMAL#	TYPE OF DEATH	DATE OF DEATH	STUDY DAY
3501	TERMINAL SACRIFICE	17-FEB-04	29
3502	TERMINAL SACRIFICE	17-FEB-04	29
3503	TERMINAL SACRIFICE	17-FEB-04	29
3504	TERMINAL SACRIFICE	17-FEB-04	29
3505	TERMINAL SACRIFICE	17-FEB-04	29
3506	TERMINAL SACRIFICE	17-FEB-04	29
3507	TERMINAL SACRIFICE	18-FEB-04	30
3508	TERMINAL SACRIFICE	18-FEB-04	30
3509	TERMINAL SACRIFICE	18-FEB-04	30
3510	TERMINAL SACRIFICE	18-FEB-04	30
3511	TERMINAL SACRIFICE	18-FEB-04	30
3512	TERMINAL SACRIFICE	18-FEB-04	30

APPENDIX A

PROPANE: COMBINED REPEATED-EXPOSURE TOXICITY, REPRODUCTION
AND NEUROTOXICITY SCREENING IN RATS VIA WHOLE-BODY
INHALATION EXPOSURES

INDIVIDUAL ANIMAL TERMINATION HISTORY

FEMALES GROUP 4 12000 PPM

ANIMAL#	TYPE OF DEATH	DATE OF DEATH	STUDY DAY
4501	TERMINAL SACRIFICE	17-FEB-04	29
4502	TERMINAL SACRIFICE	17-FEB-04	29
4503	TERMINAL SACRIFICE	17-FEB-04	29
4504	TERMINAL SACRIFICE	17-FEB-04	29
4505	TERMINAL SACRIFICE	17-FEB-04	29
4506	TERMINAL SACRIFICE	17-FEB-04	29
4507	TERMINAL SACRIFICE	18-FEB-04	30
4508	TERMINAL SACRIFICE	18-FEB-04	30
4509	TERMINAL SACRIFICE	18-FEB-04	30
4510	TERMINAL SACRIFICE	18-FEB-04	30
4511	TERMINAL SACRIFICE	18-FEB-04	30
4512	TERMINAL SACRIFICE	18-FEB-04	30

APPENDIX B

PROPANE: COMBINED REPEATED-EXPOSURE TOXICITY, REPRODUCTION AND NEUROTOXICITY SCREENING IN RATS VIA WHOLE-BODY INHALATION EXPOSURES

INDIVIDUAL CLINICAL OBSERVATIONS

MALES GROUP 1 0 PPM

ANIMAL#	OBSERVATIONS	DAY OF STUDY - 7	0	8	5	12 2	8	2 3 9	0
1001	WITHIN NORMAL LIMITS	P	P	P	P				
	TERMINAL SACRIFICE								P
	ALOPECIA - EXTREMITIES/SNOUT					3	3		
1002	WITHIN NORMAL LIMITS	P	P	P	P	P	P		
	TERMINAL SACRIFICE								P
1003	WITHIN NORMAL LIMITS	P	P	P	P	P			
	TERMINAL SACRIFICE								P
	ALOPECIA - EXTREMITIES/SNOUT						3		
1004	WITHIN NORMAL LIMITS	P	P	P	P	P	P		
	TERMINAL SACRIFICE								P
1005	WITHIN NORMAL LIMITS	P	P						
	TERMINAL SACRIFICE								P
	ALOPECIA - EXTREMITIES/SNOUT			3	3	3	3		
1006	WITHIN NORMAL LIMITS	P	P	P	P	P	P		
	TERMINAL SACRIFICE								P
1007	WITHIN NORMAL LIMITS	P	P	P	P	P	P		
	TERMINAL SACRIFICE								P
1008	WITHIN NORMAL LIMITS	P	P	P	P	P	P		
	TERMINAL SACRIFICE								P
1009	WITHIN NORMAL LIMITS	P	P	P	P	P	P		
	TERMINAL SACRIFICE								P

CODE: 1-SLIGHT 2-MODERATE 3-MARKED P-PRESENT

APPENDIX B

PROPANE: COMBINED REPEATED-EXPOSURE TOXICITY, REPRODUCTION AND NEUROTOXICITY SCREENING IN RATS VIA WHOLE-BODY INHALATION EXPOSURES

INDIVIDUAL CLINICAL OBSERVATIONS

MALES GROUP 1 0 PPM

ANIMAL#	OBSERVATIONS	DAY OF STUDY - 7	0 8	1 2 5 2	2 8	2 9	3 0
1010	WITHIN NORMAL LIMITS	P	P	P	P	P	P
	TERMINAL SACRIFICE						P
1011	WITHIN NORMAL LIMITS	P	P	P	P	P	P
	TERMINAL SACRIFICE						P
1012	WITHIN NORMAL LIMITS	P	P	P	P	P	P
	TERMINAL SACRIFICE						P

CODE: 1-SLIGHT 2-MODERATE 3-MARKED P-PRESENT

APPENDIX B

PROPANE: COMBINED REPEATED-EXPOSURE TOXICITY, REPRODUCTION
AND NEUROTOXICITY SCREENING IN RATS VIA WHOLE-BODY
INHALATION EXPOSURES

INDIVIDUAL CLINICAL OBSERVATIONS

MALES GROUP 2 1200 PPM

ANIMAL#	OBSERVATIONS	DAY OF STUDY - 7	0	8	1 5	2 2	8	2 9	3 0
2001	WITHIN NORMAL LIMITS	P	P	P	P	P	P		
	TERMINAL SACRIFICE							P	
2002	WITHIN NORMAL LIMITS	P	P	P	P	P	P		
	TERMINAL SACRIFICE							P	
2003	WITHIN NORMAL LIMITS	P	P	P	P	P	P		
	TERMINAL SACRIFICE							P	
2004	WITHIN NORMAL LIMITS	P	P	P					
	TERMINAL SACRIFICE							P	
	ALOPECIA - EXTREMITIES/SNOUT					2	2		
	SCABS				P	P	P		
	CERVICAL								
2005	WITHIN NORMAL LIMITS	P	P	P	P	P	P		
	TERMINAL SACRIFICE							P	
2006	WITHIN NORMAL LIMITS	P	P	P	P	P	P		
	TERMINAL SACRIFICE							P	
2007	WITHIN NORMAL LIMITS	P	P	P	P	P	P		
	TERMINAL SACRIFICE								P
2008	WITHIN NORMAL LIMITS	P	P	P	P	P	P		
	TERMINAL SACRIFICE								P
2009	WITHIN NORMAL LIMITS	P	P	P	P	P			
	TERMINAL SACRIFICE								P
	RED STAINS - EXTREMITIES/SNOUT					1			

CODE: 1-SLIGHT 2-MODERATE 3-MARKED P-PRESENT

APPENDIX B

PROPANE: COMBINED REPEATED-EXPOSURE TOXICITY, REPRODUCTION AND NEUROTOXICITY SCREENING IN RATS VIA WHOLE-BODY INHALATION EXPOSURES

INDIVIDUAL CLINICAL OBSERVATIONS

MALES GROUP 2 1200 PPM

ANIMAL#	OBSERVATIONS	DAY OF STUDY - 7	0	8	5	2	8	9	0
2010	WITHIN NORMAL LIMITS	P	P	P	P	P			
	TERMINAL SACRIFICE								P
	RED STAINS - EXTREMITIES/SNOUT						1		
2011	WITHIN NORMAL LIMITS	P	P	P	P	P	P		
	TERMINAL SACRIFICE								P
2012	WITHIN NORMAL LIMITS	P	P	P	P	P	P		
	TERMINAL SACRIFICE								P

CODE: 1-SLIGHT 2-MODERATE 3-MARKED P-PRESENT

APPENDIX B

PROPANE: COMBINED REPEATED-EXPOSURE TOXICITY, REPRODUCTION AND NEUROTOXICITY SCREENING IN RATS VIA WHOLE-BODY INHALATION EXPOSURES

INDIVIDUAL CLINICAL OBSERVATIONS

MALES GROUP 3 4000 PPM

ANIMAL#	OBSERVATIONS	DAY OF STUDY - 7	0	8	1 5	2	2 8	2 9	3 0
3001	WITHIN NORMAL LIMITS	P	P	P	P	P	P		
	TERMINAL SACRIFICE							P	
3002	WITHIN NORMAL LIMITS	P	P	P	P				
	TERMINAL SACRIFICE							P	
	ALOPECIA - EXTREMITIES/SNOUT					2	2		
3003	WITHIN NORMAL LIMITS	P	P	P	P				
	TERMINAL SACRIFICE							P	
	ALOPECIA - EXTREMITIES/SNOUT					2	3		
3004	WITHIN NORMAL LIMITS	P	P	P	P	P	P		
	TERMINAL SACRIFICE							P	
3005	WITHIN NORMAL LIMITS	P	P	P	P	P	P		
	TERMINAL SACRIFICE							P	
3006	WITHIN NORMAL LIMITS	P	P	P	P				
	TERMINAL SACRIFICE							P	
	ALOPECIA - EXTREMITIES/SNOUT					2	2		
	RED STAINS - EXTREMITIES/SNOUT					1			
3007	WITHIN NORMAL LIMITS	P	P			P	P		
	TERMINAL SACRIFICE								P
	NASAL DISCHARGE - RED				P	P			
3008	WITHIN NORMAL LIMITS	P	P	P	P	P			
	TERMINAL SACRIFICE								P
	RED STAINS - EXTREMITIES/SNOUT						1		

CODE: 1-SLIGHT 2-MODERATE 3-MARKED P-PRESENT

APPENDIX B

PROPANE: COMBINED REPEATED-EXPOSURE TOXICITY, REPRODUCTION AND NEUROTOXICITY SCREENING IN RATS VIA WHOLE-BODY INHALATION EXPOSURES

INDIVIDUAL CLINICAL OBSERVATIONS

MALES GROUP 3 4000 PPM

ANIMAL#	OBSERVATIONS	DAY OF STUDY - 7	0	8	5	2	8	9	1 2 2 2 3 0
3009	WITHIN NORMAL LIMITS	P	P	P	P	P	P		
	TERMINAL SACRIFICE								P
3010	WITHIN NORMAL LIMITS	P	P	P	P	P	P		
	TERMINAL SACRIFICE								P
3011	WITHIN NORMAL LIMITS	P	P	P	P	P	P		
	TERMINAL SACRIFICE								P
3012	WITHIN NORMAL LIMITS	P	P	P	P	P	P		
	TERMINAL SACRIFICE								P

CODE: 1-SLIGHT 2-MODERATE 3-MARKED P-PRESENT

APPENDIX B

PROPANE: COMBINED REPEATED-EXPOSURE TOXICITY, REPRODUCTION AND NEUROTOXICITY SCREENING IN RATS VIA WHOLE-BODY INHALATION EXPOSURES

INDIVIDUAL CLINICAL OBSERVATIONS

MALES GROUP 4 12000 PPM

ANIMAL#	OBSERVATIONS	DAY OF STUDY - 7	0	8	5	2	8	9	0
4001	WITHIN NORMAL LIMITS	P	P	P	P	P	P		
	TERMINAL SACRIFICE								P
4002	WITHIN NORMAL LIMITS	P	P	P	P				
	TERMINAL SACRIFICE								P
	ALOPECIA - EXTREMITIES/SNOUT					2	2		
4003	WITHIN NORMAL LIMITS	P	P				P		
	TERMINAL SACRIFICE								P
	RED STAINS - EXTREMITIES/SNOUT					1			
	CHROMODACRYORRHEA - BILATERAL			P	P				
4004	WITHIN NORMAL LIMITS	P	P	P	P				
	TERMINAL SACRIFICE								P
	ALOPECIA - EXTREMITIES/SNOUT					2	2		
4005	WITHIN NORMAL LIMITS	P	P	P	P	P	P		
	TERMINAL SACRIFICE								P
4006	WITHIN NORMAL LIMITS	P	P	P	P	P	P		
	TERMINAL SACRIFICE								P
4007	WITHIN NORMAL LIMITS	P	P			P	P		
	TERMINAL SACRIFICE							P	
	CHROMODACRYORRHEA - BILATERAL			P	P				
4008	WITHIN NORMAL LIMITS	P	P	P	P	P	P		
	TERMINAL SACRIFICE							P	

CODE: 1-SLIGHT 2-MODERATE 3-MARKED P-PRESENT

APPENDIX B

PROPANE: COMBINED REPEATED-EXPOSURE TOXICITY, REPRODUCTION
AND NEUROTOXICITY SCREENING IN RATS VIA WHOLE-BODY
INHALATION EXPOSURES

INDIVIDUAL CLINICAL OBSERVATIONS

MALES GROUP 4 12000 PPM

ANIMAL#	OBSERVATIONS	DAY OF STUDY - 7	0	8	1 5	2 2	8	2 9	3 0
4009	WITHIN NORMAL LIMITS	P	P			P			
	TERMINAL SACRIFICE								P
	RED STAINS - EXTREMITIES/SNOUT						1		
	LACRIMATION - UNILATERAL				2				
	NASAL DISCHARGE - RED					P			
4010	WITHIN NORMAL LIMITS	P	P	P	P		P		
	TERMINAL SACRIFICE								P
	RED STAINS - EXTREMITIES/SNOUT						1		
4011	WITHIN NORMAL LIMITS	P	P	P	P		P		
	TERMINAL SACRIFICE								P
	RED STAINS - EXTREMITIES/SNOUT						1		
4012	WITHIN NORMAL LIMITS	P	P	P	P	P	P		
	TERMINAL SACRIFICE								P

CODE: 1-SLIGHT 2-MODERATE 3-MARKED P-PRESENT

APPENDIX B

PROPANE: COMBINED REPEATED-EXPOSURE TOXICITY, REPRODUCTION
AND NEUROTOXICITY SCREENING IN RATS VIA WHOLE-BODY
INHALATION EXPOSURES

INDIVIDUAL CLINICAL OBSERVATIONS

FEMALES GROUP 1 0 PPM

ANIMAL#	OBSERVATIONS	DAY OF STUDY - 7	0	8	1 5	2	2 8	2 9	3 0
1501	WITHIN NORMAL LIMITS	P	P	P	P	P	P		
	TERMINAL SACRIFICE							P	
1502	WITHIN NORMAL LIMITS	P	P	P	P				
	TERMINAL SACRIFICE							P	
	ALOPECIA - EXTREMITIES/SNOUT					3	3		
	RED STAINS - EXTREMITIES/SNOUT					1			
1503	WITHIN NORMAL LIMITS	P	P	P	P	P	P		
	TERMINAL SACRIFICE							P	
1504	WITHIN NORMAL LIMITS	P	P	P	P	P	P		
	TERMINAL SACRIFICE							P	
1505	WITHIN NORMAL LIMITS	P	P	P	P	P	P		
	TERMINAL SACRIFICE							P	
1506	WITHIN NORMAL LIMITS	P	P	P	P	P	P		
	TERMINAL SACRIFICE							P	
1507	WITHIN NORMAL LIMITS	P	P	P	P				
	TERMINAL SACRIFICE								P
	ALOPECIA - EXTREMITIES/SNOUT					3	3		
1508	WITHIN NORMAL LIMITS	P	P	P	P	P	P		
	TERMINAL SACRIFICE								P
1509	WITHIN NORMAL LIMITS	P	P	P	P		P		
	TERMINAL SACRIFICE								P
	RED STAINS - EXTREMITIES/SNOUT					1			

CODE: 1-SLIGHT 2-MODERATE 3-MARKED P-PRESENT

APPENDIX B

PROPANE: COMBINED REPEATED-EXPOSURE TOXICITY, REPRODUCTION AND NEUROTOXICITY SCREENING IN RATS VIA WHOLE-BODY INHALATION EXPOSURES

INDIVIDUAL CLINICAL OBSERVATIONS

FEMALES GROUP 1 0 PPM

ANIMAL#	OBSERVATIONS	DAY OF STUDY - 7	0	8	5	2	8	9	0
1510	WITHIN NORMAL LIMITS	P	P	P	P		P		
	TERMINAL SACRIFICE								P
	RED STAINS - EXTREMITIES/SNOUT					1			
1511	WITHIN NORMAL LIMITS	P	P	P	P	P	P		
	TERMINAL SACRIFICE								P
1512	WITHIN NORMAL LIMITS	P	P	P	P	P	P		
	TERMINAL SACRIFICE								P

CODE: 1-SLIGHT 2-MODERATE 3-MARKED P-PRESENT

APPENDIX B

PROPANE: COMBINED REPEATED-EXPOSURE TOXICITY, REPRODUCTION AND NEUROTOXICITY SCREENING IN RATS VIA WHOLE-BODY INHALATION EXPOSURES

INDIVIDUAL CLINICAL OBSERVATIONS

FEMALES GROUP 2 1200 PPM

ANIMAL#	OBSERVATIONS	DAY OF STUDY - 7	0	8	1 5	2 2	8	2 9	3 0
2501	WITHIN NORMAL LIMITS	P	P	P	P	P	P		
	TERMINAL SACRIFICE							P	
2502	WITHIN NORMAL LIMITS	P	P	P	P		P		
	TERMINAL SACRIFICE							P	
	RED STAINS - EXTREMITIES/SNOUT					1			
2503	WITHIN NORMAL LIMITS	P	P	P	P	P	P		
	TERMINAL SACRIFICE							P	
2504	WITHIN NORMAL LIMITS	P	P	P	P	P	P		
	TERMINAL SACRIFICE							P	
2505	WITHIN NORMAL LIMITS	P	P	P	P		P		
	TERMINAL SACRIFICE							P	
	ALOPECIA - EXTREMITIES/SNOUT					2			
2506	WITHIN NORMAL LIMITS	P	P	P	P	P	P		
	TERMINAL SACRIFICE							P	
2507	WITHIN NORMAL LIMITS	P	P	P	P	P	P		
	TERMINAL SACRIFICE								P
2508	WITHIN NORMAL LIMITS	P	P	P	P				
	TERMINAL SACRIFICE								P
	ALOPECIA - EXTREMITIES/SNOUT					2	2		
2509	WITHIN NORMAL LIMITS	P	P	P	P	P	P		
	TERMINAL SACRIFICE								P

CODE: 1-SLIGHT 2-MODERATE 3-MARKED P-PRESENT

APPENDIX B

PROPANE: COMBINED REPEATED-EXPOSURE TOXICITY, REPRODUCTION
AND NEUROTOXICITY SCREENING IN RATS VIA WHOLE-BODY
INHALATION EXPOSURES

INDIVIDUAL CLINICAL OBSERVATIONS

FEMALES GROUP 2 1200 PPM

ANIMAL#	OBSERVATIONS	DAY OF STUDY - 7	0	8	1 2 5	2	2 8	2 9	3 0
2510	WITHIN NORMAL LIMITS	P	P	P	P	P	P		
	TERMINAL SACRIFICE								P
2511	WITHIN NORMAL LIMITS	P	P	P	P		P		
	TERMINAL SACRIFICE								P
	RED STAINS - EXTREMITIES/SNOUT					1			
2512	WITHIN NORMAL LIMITS	P	P	P	P	P	P		
	TERMINAL SACRIFICE								P

CODE: 1-SLIGHT 2-MODERATE 3-MARKED P-PRESENT

APPENDIX B

PROPANE: COMBINED REPEATED-EXPOSURE TOXICITY, REPRODUCTION
AND NEUROTOXICITY SCREENING IN RATS VIA WHOLE-BODY
INHALATION EXPOSURES

INDIVIDUAL CLINICAL OBSERVATIONS

FEMALES GROUP 3 4000 PPM

ANIMAL#	OBSERVATIONS	DAY OF STUDY - 7	0	8	1 5	2	2 8	2 9	3 0
3501	WITHIN NORMAL LIMITS	P	P	P	P	P	P		
	TERMINAL SACRIFICE							P	
3502	WITHIN NORMAL LIMITS	P	P	P	P	P	P		
	TERMINAL SACRIFICE							P	
3503	WITHIN NORMAL LIMITS	P	P	P	P	P	P		
	TERMINAL SACRIFICE							P	
3504	WITHIN NORMAL LIMITS	P	P	P	P		P		
	TERMINAL SACRIFICE							P	
	RED STAINS - EXTREMITIES/SNOUT					1			
3505	WITHIN NORMAL LIMITS	P	P	P	P	P	P		
	TERMINAL SACRIFICE							P	
3506	WITHIN NORMAL LIMITS	P	P	P	P	P	P		
	TERMINAL SACRIFICE							P	
3507	WITHIN NORMAL LIMITS	P	P	P	P				
	TERMINAL SACRIFICE								P
	RED STAINS - EXTREMITIES/SNOUT					1	1		
3508	WITHIN NORMAL LIMITS	P	P	P	P	P			
	TERMINAL SACRIFICE								P
	RED STAINS - EXTREMITIES/SNOUT						1		
3509	WITHIN NORMAL LIMITS	P	P	P	P	P	P		
	TERMINAL SACRIFICE								P

CODE: 1-SLIGHT 2-MODERATE 3-MARKED P-PRESENT

APPENDIX B

PROPANE: COMBINED REPEATED-EXPOSURE TOXICITY, REPRODUCTION
AND NEUROTOXICITY SCREENING IN RATS VIA WHOLE-BODY
INHALATION EXPOSURES

INDIVIDUAL CLINICAL OBSERVATIONS

FEMALES GROUP 3 4000 PPM

ANIMAL#	OBSERVATIONS	DAY OF STUDY - 7	0	8	5	2	8	9	0
3510	WITHIN NORMAL LIMITS	P	P	P	P	P	P		
	TERMINAL SACRIFICE								P
3511	WITHIN NORMAL LIMITS	P	P	P	P	P	P		
	TERMINAL SACRIFICE								P
3512	WITHIN NORMAL LIMITS	P	P	P	P	P	P		
	TERMINAL SACRIFICE								P

CODE: 1-SLIGHT 2-MODERATE 3-MARKED P-PRESENT

APPENDIX B

PROPANE: COMBINED REPEATED-EXPOSURE TOXICITY, REPRODUCTION AND NEUROTOXICITY SCREENING IN RATS VIA WHOLE-BODY INHALATION EXPOSURES

INDIVIDUAL CLINICAL OBSERVATIONS

FEMALES GROUP 4 12000 PPM

ANIMAL#	OBSERVATIONS	DAY OF STUDY - 7	0	8	5	2	8	9	2 2 3 0
4501	WITHIN NORMAL LIMITS	P	P	P	P				
	TERMINAL SACRIFICE								P
	RED STAINS - EXTREMITIES/SNOUT					1	1		
4502	WITHIN NORMAL LIMITS	P	P	P	P	P	P		
	TERMINAL SACRIFICE								P
4503	WITHIN NORMAL LIMITS	P	P	P	P	P	P		
	TERMINAL SACRIFICE								P
4504	WITHIN NORMAL LIMITS	P	P	P	P	P	P		
	TERMINAL SACRIFICE								P
4505	WITHIN NORMAL LIMITS	P	P	P	P		P		
	TERMINAL SACRIFICE								P
	RED STAINS - EXTREMITIES/SNOUT					1			
4506	WITHIN NORMAL LIMITS	P	P	P	P				
	TERMINAL SACRIFICE								P
	ALOPECIA - EXTREMITIES/SNOUT					2	3		
	RED STAINS - EXTREMITIES/SNOUT					1			
4507	WITHIN NORMAL LIMITS	P	P	P	P	P	P		
	TERMINAL SACRIFICE								P
4508	WITHIN NORMAL LIMITS	P	P	P	P	P	P		
	TERMINAL SACRIFICE								P

CODE: 1-SLIGHT 2-MODERATE 3-MARKED P-PRESENT

APPENDIX B

PROPANE: COMBINED REPEATED-EXPOSURE TOXICITY, REPRODUCTION
AND NEUROTOXICITY SCREENING IN RATS VIA WHOLE-BODY
INHALATION EXPOSURES

INDIVIDUAL CLINICAL OBSERVATIONS

FEMALES GROUP 4 12000 PPM

ANIMAL#	OBSERVATIONS	DAY OF STUDY - 7	0	8	5	2	8	9	0
4509	WITHIN NORMAL LIMITS	P	P	P	P	P	P		
	TERMINAL SACRIFICE								P
4510	WITHIN NORMAL LIMITS	P	P	P	P		P		
	TERMINAL SACRIFICE								P
	RED STAINS - EXTREMITIES/SNOUT					1			
4511	WITHIN NORMAL LIMITS	P	P	P	P	P	P		
	TERMINAL SACRIFICE								P
4512	WITHIN NORMAL LIMITS	P	P	P	P				
	TERMINAL SACRIFICE								P
	ALOPECIA - EXTREMITIES/SNOUT					3	3		

CODE: 1-SLIGHT 2-MODERATE 3-MARKED P-PRESENT

APPENDIX C

PROPANE: COMBINED REPEATED-EXPOSURE TOXICITY, REPRODUCTION AND NEUROTOXICITY SCREENING IN RATS VIA WHOLE-BODY INHALATION EXPOSURES

INDIVIDUAL BODY WEIGHTS (GRAMS)

MALES GROUP 1 0 PPM

	DAY OF STUDY					
ANIMAL#	-7	0	7	14	21	28
1001	195	270	317	363	374	420
1002	198	265	307	342	375	396
1003	204	280	330	370	396	419
1004	206	280	334	356	386	412
1005	187	259	308	346	373	401
1006	202	283	334	376	404	435
1007	193	261	303	334	372	406
1008	210	285	335	373	398	435
1009	201	268	303	324	350	368
1010	194	275	339	383	431	462
1011	191	267	319	362	400	419
1012	184	247	289	317	338	362
MEAN	197	270	318	354	383	411
S.D.	8.0	11.2	16.2	21.3	25.1	27.8
N	12	12	12	12	12	12

APPENDIX C

PROPANE: COMBINED REPEATED-EXPOSURE TOXICITY, REPRODUCTION
AND NEUROTOXICITY SCREENING IN RATS VIA WHOLE-BODY
INHALATION EXPOSURES

INDIVIDUAL BODY WEIGHTS (GRAMS)

MALES GROUP 2 1200 PPM

	DAY OF STUDY					
ANIMAL#	-7	0	7	14	21	28
2001	184	251	287	322	361	380
2002	201	273	327	365	392	425
2003	186	245	283	314	328	354
2004	210	292	354	388	425	444
2005	197	263	310	337	375	393
2006	204	280	331	359	392	422
2007	208	285	325	375	400	422
2008	191	268	321	346	371	406
2009	198	267	315	354	389	419
2010	194	258	299	309	337	352
2011	193	250	287	309	337	347
2012	203	275	320	349	374	392
MEAN	197	267	313	344	373	396
S.D.	8.3	14.7	21.2	26.2	28.9	32.4
N	12	12	12	12	12	12

APPENDIX C

PROPANE: COMBINED REPEATED-EXPOSURE TOXICITY, REPRODUCTION AND NEUROTOXICITY SCREENING IN RATS VIA WHOLE-BODY INHALATION EXPOSURES

INDIVIDUAL BODY WEIGHTS (GRAMS)

MALES GROUP 3 4000 PPM

	DAY OF STUDY					
ANIMAL#	-7	0	7	14	21	28
3001	210	289	345	382	415	453
3002	194	263	311	350	379	399
3003	193	264	315	335	383	409
3004	205	297	356	408	449	491
3005	202	285	336	367	406	445
3006	191	270	328	362	390	401
3007	201	273	314	339	371	393
3008	194	260	303	341	373	401
3009	201	287	338	385	426	457
3010	207	283	316	338	356	379
3011	186	252	304	338	362	381
3012	184	250	288	317	354	371
MEAN	197	273	321	355	389	415
S.D.	8.3	15.3	19.7	26.3	29.7	37.4
N	12	12	12	12	12	12

APPENDIX C

PROPANE: COMBINED REPEATED-EXPOSURE TOXICITY, REPRODUCTION
AND NEUROTOXICITY SCREENING IN RATS VIA WHOLE-BODY
INHALATION EXPOSURES

INDIVIDUAL BODY WEIGHTS (GRAMS)

MALES GROUP 4 12000 PPM

	DAY OF STUDY					
ANIMAL#	-7	0	7	14	21	28
4001	195	264	307	345	367	361
4002	201	267	308	346	372	387
4003	205	273	305	335	361	381
4004	190	247	273	293	323	345
4005	209	283	321	351	392	417
4006	192	262	309	326	352	382
4007	188	257	297	324	359	382
4008	209	284	323	353	386	399
4009	201	269	304	333	360	375
4010	194	264	300	340	373	395
4011	185	243	266	289	313	326
4012	202	281	317	337	356	382
MEAN	198	266	302	331	359	378
S.D.	8.1	13.0	17.5	20.7	22.7	24.3
N	12	12	12	12	12	12

APPENDIX C

PROPANE: COMBINED REPEATED-EXPOSURE TOXICITY, REPRODUCTION
AND NEUROTOXICITY SCREENING IN RATS VIA WHOLE-BODY
INHALATION EXPOSURES

INDIVIDUAL BODY WEIGHTS (GRAMS)

FEMALES GROUP 1 0 PPM

	DAY OF STUDY					
ANIMAL#	-7	0	7	14	21	28
1501	162	200	210	222	230	238
1502	167	205	222	241	261	268
1503	174	215	224	247	252	273
1504	175	205	229	245	253	248
1505	179	212	221	246	253	257
1506	161	189	208	224	237	244
1507	154	195	221	232	236	248
1508	164	191	209	224	229	232
1509	162	202	213	231	248	255
1510	173	203	218	239	252	252
1511	169	213	224	239	266	276
1512	179	220	253	265	290	307
MEAN	168	204	221	238	251	258
S.D.	7.9	9.7	12.1	12.5	17.1	20.5
N	12	12	12	12	12	12

APPENDIX C

PROPANE: COMBINED REPEATED-EXPOSURE TOXICITY, REPRODUCTION
AND NEUROTOXICITY SCREENING IN RATS VIA WHOLE-BODY
INHALATION EXPOSURES

INDIVIDUAL BODY WEIGHTS (GRAMS)

FEMALES GROUP 2 1200 PPM

	DAY OF STUDY					
ANIMAL#	-7	0	7	14	21	28
2501	155	182	188	210	227	231
2502	178	202	234	258	272	274
2503	162	197	216	228	248	257
2504	176	209	215	222	253	261
2505	168	194	215	232	238	237
2506	173	205	223	233	236	252
2507	179	206	219	244	269	268
2508	160	191	219	231	241	251
2509	168	208	230	245	266	276
2510	165	184	206	219	224	240
2511	175	213	225	238	256	253
2512	163	195	199	219	225	236
MEAN	168	199	216	232	246	253
S.D.	7.6	10.0	13.0	13.5	17.2	15.0
N	12	12	12	12	12	12

APPENDIX C

PROPANE: COMBINED REPEATED-EXPOSURE TOXICITY, REPRODUCTION AND NEUROTOXICITY SCREENING IN RATS VIA WHOLE-BODY INHALATION EXPOSURES

INDIVIDUAL BODY WEIGHTS (GRAMS)

FEMALES GROUP 3 4000 PPM

	DAY OF STUDY					
ANIMAL#	-7	0	7	14	21	28
3501	161	194	210	227	235	240
3502	169	201	217	229	232	249
3503	177	207	215	239	247	257
3504	180	220	236	240	259	265
3505	170	201	223	237	239	254
3506	174	204	218	234	238	251
3507	168	194	211	224	222	237
3508	163	198	207	235	255	265
3509	166	207	223	235	262	272
3510	159	189	207	221	232	237
3511	177	210	226	243	250	260
3512	156	190	210	216	226	240
MEAN	168	201	217	232	241	252
S.D.	7.7	8.9	8.8	8.3	13.0	12.2
N	12	12	12	12	12	12

APPENDIX C

PROPANE: COMBINED REPEATED-EXPOSURE TOXICITY, REPRODUCTION
AND NEUROTOXICITY SCREENING IN RATS VIA WHOLE-BODY
INHALATION EXPOSURES

INDIVIDUAL BODY WEIGHTS (GRAMS)

FEMALES GROUP 4 12000 PPM

	DAY OF STUDY					
ANIMAL#	-7	0	7	14	21	28
4501	168	207	223	246	262	269
4502	181	211	219	232	244	245
4503	170	202	216	242	253	260
4504	177	204	214	231	233	235
4505	169	209	233	254	272	286
4506	164	190	212	219	232	242
4507	158	199	202	216	228	237
4508	157	188	201	212	224	228
4509	161	202	220	223	236	247
4510	177	213	230	235	250	260
4511	174	209	221	240	254	266
4512	162	196	211	223	236	254
MEAN	168	202	217	231	244	252
S.D.	7.9	8.1	9.7	12.9	14.7	16.6
N	12	12	12	12	12	12

APPENDIX D

PROPANE: COMBINED REPEATED-EXPOSURE TOXICITY, REPRODUCTION AND NEUROTOXICITY SCREENING IN RATS VIA WHOLE-BODY INHALATION EXPOSURES

INDIVIDUAL BODY WEIGHT GAIN (GRAMS)

MALES GROUP 1 0 PPM

	DAY OF STUDY					
ANIMAL#	-7-0	0-7	7-14	14-21	21-28	0-28
1001	75	47	47	11	45	149
1002	67	42	35	33	21	131
1003	76	50	40	27	23	139
1004	74	54	22	30	26	132
1005	72	49	39	27	28	143
1006	82	51	42	28	31	151
1007	68	42	31	38	34	146
1008	74	51	38	25	37	150
1009	67	35	21	26	18	100
1010	82	64	44	48	31	187
1011	75	52	43	39	18	152
1012	63	42	27	21	24	115
MEAN	73	48	36	29	28	141
S.D.	5.7	7.4	8.6	9.3	8.1	21.5
N	12	12	12	12	12	12

APPENDIX D

PROPANE: COMBINED REPEATED-EXPOSURE TOXICITY, REPRODUCTION AND NEUROTOXICITY SCREENING IN RATS VIA WHOLE-BODY INHALATION EXPOSURES

INDIVIDUAL BODY WEIGHT GAIN (GRAMS)

MALES GROUP 2 1200 PPM

	DAY OF STUDY					
ANIMAL#	-7-0	0-7	7-14	14-21	21-28	0-28
2001	67	36	35	38	19	129
2002	72	54	37	28	32	152
2003	59	38	31	15	26	109
2004	82	62	34	37	19	152
2005	66	47	28	37	18	130
2006	76	51	28	32	31	143
2007	77	41	49	25	23	137
2008	77	53	25	25	34	138
2009	69	48	39	35	30	152
2010	64	41	11	27	16	95
2011	57	37	22	28	10	97
2012	73	45	28	25	18	117
MEAN	70	46	31	29	23	129
S.D.	7.7	8.0	9.6	6.9	7.6	20.6
N	12	12	12	12	12	12

APPENDIX D

PROPANE: COMBINED REPEATED-EXPOSURE TOXICITY, REPRODUCTION AND NEUROTOXICITY SCREENING IN RATS VIA WHOLE-BODY INHALATION EXPOSURES

INDIVIDUAL BODY WEIGHT GAIN (GRAMS)

MALES GROUP 3 4000 PPM

	DAY OF STUDY					
ANIMAL#	-7-0	0-7	7-14	14-21	21-28	0-28
3001	79	56	37	33	38	164
3002	69	48	39	29	21	136
3003	72	51	20	48	26	145
3004	92	59	53	41	42	194
3005	84	51	31	38	40	160
3006	79	58	34	29	11	132
3007	72	41	24	32	23	120
3008	66	43	37	32	28	141
3009	86	51	47	41	30	170
3010	77	32	22	18	23	96
3011	66	52	34	24	18	128
3012	66	38	30	37	17	121
MEAN	76	48	34	34	26	142
S.D.	8.5	8.3	9.6	8.0	9.6	26.5
N	12	12	12	12	12	12

APPENDIX D

PROPANE: COMBINED REPEATED-EXPOSURE TOXICITY, REPRODUCTION AND NEUROTOXICITY SCREENING IN RATS VIA WHOLE-BODY INHALATION EXPOSURES

INDIVIDUAL BODY WEIGHT GAIN (GRAMS)

MALES GROUP 4 12000 PPM

	DAY OF STUDY					
ANIMAL#	-7-0	0-7	7-14	14-21	21-28	0-28
4001	69	43	38	22	-5	97
4002	65	42	37	26	16	121
4003	68	32	30	26	21	109
4004	57	25	20	30	22	97
4005	74	38	30	40	26	134
4006	70	47	17	26	31	120
4007	69	40	27	35	24	125
4008	75	39	30	33	12	115
4009	69	35	29	28	14	105
4010	71	36	40	33	22	130
4011	58	23	24	24	13	84
4012	78	36	20	19	26	101
MEAN	69	36	28	28	18	112
S.D.	6.2	7.0	7.4	6.0	9.4	15.3
N	12	12	12	12	12	12

APPENDIX D

PROPANE: COMBINED REPEATED-EXPOSURE TOXICITY, REPRODUCTION AND NEUROTOXICITY SCREENING IN RATS VIA WHOLE-BODY INHALATION EXPOSURES

INDIVIDUAL BODY WEIGHT GAIN (GRAMS)

FEMALES GROUP 1 0 PPM

	DAY OF STUDY					
ANIMAL#	-7-0	0-7	7-14	14-21	21-28	0-28
1501	38	10	12	9	7	38
1502	38	16	19	21	7	63
1503	41	9	22	6	21	58
1504	30	24	16	8	-5	43
1505	34	9	24	8	4	45
1506	28	19	15	13	8	56
1507	41	25	11	4	12	52
1508	27	19	14	5	3	41
1509	40	11	18	16	7	53
1510	31	15	21	14	0	49
1511	45	11	15	27	10	63
1512	41	33	12	24	17	87
MEAN	36	17	17	13	8	54
S.D.	5.9	7.6	4.3	7.7	7.2	13.2
N	12	12	12	12	12	12

APPENDIX D

PROPANE: COMBINED REPEATED-EXPOSURE TOXICITY, REPRODUCTION AND NEUROTOXICITY SCREENING IN RATS VIA WHOLE-BODY INHALATION EXPOSURES

INDIVIDUAL BODY WEIGHT GAIN (GRAMS)

FEMALES GROUP 2 1200 PPM

	DAY OF STUDY					
ANIMAL#	-7-0	0-7	7-14	14-21	21-28	0-28
2501	27	6	22	17	4	49
2502	24	32	24	14	2	72
2503	35	19	12	20	9	60
2504	32	6	7	31	8	53
2505	25	22	17	6	-1	43
2506	32	18	10	3	16	47
2507	27	13	25	25	-1	62
2508	31	28	13	10	11	60
2509	40	22	16	20	10	68
2510	19	22	13	5	16	56
2511	39	12	13	18	-3	40
2512	32	4	20	7	10	41
MEAN	30	17	16	15	7	54
S.D.	6.1	8.9	5.8	8.8	6.5	10.7
N	12	12	12	12	12	12

APPENDIX D

PROPANE: COMBINED REPEATED-EXPOSURE TOXICITY, REPRODUCTION AND NEUROTOXICITY SCREENING IN RATS VIA WHOLE-BODY INHALATION EXPOSURES

INDIVIDUAL BODY WEIGHT GAIN (GRAMS)

FEMALES GROUP 3 4000 PPM

	DAY OF STUDY					
ANIMAL#	-7-0	0-7	7-14	14-21	21-28	0-28
3501	33	15	18	8	5	46
3502	32	16	11	3	17	47
3503	30	8	24	8	10	50
3504	40	16	3	19	7	46
3505	31	22	15	2	14	53
3506	29	14	16	4	13	47
3507	26	16	14	-2	15	42
3508	35	10	28	19	10	68
3509	41	16	12	27	10	65
3510	30	17	14	11	5	47
3511	33	16	17	7	9	50
3512	34	20	6	10	14	50
MEAN	33	15	15	10	11	51
S.D.	4.3	3.8	6.8	8.5	3.9	7.8
N	12	12	12	12	12	12

APPENDIX D

PROPANE: COMBINED REPEATED-EXPOSURE TOXICITY, REPRODUCTION AND NEUROTOXICITY SCREENING IN RATS VIA WHOLE-BODY INHALATION EXPOSURES

INDIVIDUAL BODY WEIGHT GAIN (GRAMS)

FEMALES GROUP 4 12000 PPM

	DAY OF STUDY					
ANIMAL#	-7-0	0-7	7-14	14-21	21-28	0-28
4501	39	16	23	16	7	62
4502	30	9	13	11	1	34
4503	32	14	27	11	7	58
4504	27	10	17	3	2	31
4505	40	24	21	18	14	78
4506	25	22	8	13	10	52
4507	41	3	15	12	9	38
4508	30	14	10	12	4	40
4509	40	18	3	13	12	46
4510	36	17	6	15	10	47
4511	35	12	19	15	11	57
4512	34	15	11	14	18	58
MEAN	34	15	14	13	9	50
S.D.	5.4	5.8	7.2	3.7	4.8	13.3
N	12	12	12	12	12	12

APPENDIX E

PROPANE: COMBINED REPEATED-EXPOSURE TOXICITY, REPRODUCTION AND NEUROTOXICITY SCREENING IN RATS VIA WHOLE-BODY INHALATION EXPOSURES

INDIVIDUAL FEED CONSUMPTION (GRAMS/KG/DAY)

MALES GROUP 1 0 PPM

	DAY OF STUDY		
ANIMAL#	0	7	14
1001	103	83	75
1002	93	81	72
1003	101	85	75
1004	101	89	75
1005	105	87	77
1006	98	83	71
1007	96	85	69
1008	99	87	73
1009	98	82	72
1010	102	89	76
1011	107	91	78
1012	94	84	68
MEAN	100	85	73
S.D.	4.3	3.2	3.0
N	12	12	12

APPENDIX E

PROPANE: COMBINED REPEATED-EXPOSURE TOXICITY, REPRODUCTION AND NEUROTOXICITY SCREENING IN RATS VIA WHOLE-BODY INHALATION EXPOSURES

INDIVIDUAL FEED CONSUMPTION (GRAMS/KG/DAY)

MALES GROUP 2 1200 PPM

	DAY OF STUDY		
ANIMAL#	0	7	14
2001	100	81	70
2002	101	83	68
2003	98	84	68
2004	106	90	73
2005	105	87	73
2006	106	88	74
2007	107	82	74
2008	106	87	73
2009	101	85	75
2010	102	87	72
2011	101	84	73
2012	109	93	77
MEAN	103	86	73
S.D.	3.4	3.5	2.6
N	12	12	12

APPENDIX E

PROPANE: COMBINED REPEATED-EXPOSURE TOXICITY, REPRODUCTION AND NEUROTOXICITY SCREENING IN RATS VIA WHOLE-BODY INHALATION EXPOSURES

INDIVIDUAL FEED CONSUMPTION (GRAMS/KG/DAY)

MALES GROUP 3 4000 PPM

	DAY OF STUDY		
ANIMAL#	0	7	14
3001	103	87	73
3002	108	90	78
3003	104	88	69
3004	109	89	79
3005	96	87	74
3006	115	103	82
3007	99	79	68
3008	100	80	75
3009	107	88	74
3010	105	96	77
3011	108	99	82
3012	104	86	72
MEAN	105	89	75
S.D.	5.0	7.0	4.5
N	12	12	12

APPENDIX E

PROPANE: COMBINED REPEATED-EXPOSURE TOXICITY, REPRODUCTION AND NEUROTOXICITY SCREENING IN RATS VIA WHOLE-BODY INHALATION EXPOSURES

INDIVIDUAL FEED CONSUMPTION (GRAMS/KG/DAY)

MALES GROUP 4 12000 PPM

	DAY OF STUDY		
ANIMAL#	0	7	14
4001	102	84	74
4002	96	83	74
4003	97	78	69
4004	97	76	68
4005	105	87	71
4006	108	89	70
4007	108	85	74
4008	106	83	71
4009	103	83	69
4010	99	80	72
4011	103	79	72
4012	106	78	75
MEAN	102	82	72
S.D.	4.4	3.9	2.4
N	12	12	12

APPENDIX E

PROPANE: COMBINED REPEATED-EXPOSURE TOXICITY, REPRODUCTION
AND NEUROTOXICITY SCREENING IN RATS VIA WHOLE-BODY
INHALATION EXPOSURES

INDIVIDUAL FEED CONSUMPTION (GRAMS/KG/DAY)

FEMALES GROUP 1 0 PPM

	DAY OF STUDY				
ANIMAL#	0	7	14	21	28
1501	92	79	77	72	65
1502	99	81	78	72	65
1503	100	SF	80	71	71
1504	100	79	83	76	67
1505	SF	76	77	69	60
1506	97	94	81	77	71
1507	105	92	79	74	71
1508	94	87	83	76	75
1509	102	81	SF	75	67
1510	95	87	84	73	75
1511	99	SF	84	75	62
1512	98	88	81	81	73
MEAN	98	84	81	74	69
S.D.	3.7	6.0	2.6	3.1	4.8
N	11	10	11	12	12

SF=Spilled Feeder

APPENDIX E

PROPANE: COMBINED REPEATED-EXPOSURE TOXICITY, REPRODUCTION AND NEUROTOXICITY SCREENING IN RATS VIA WHOLE-BODY INHALATION EXPOSURES

INDIVIDUAL FEED CONSUMPTION (GRAMS/KG/DAY)

FEMALES GROUP 2 1200 PPM

	DAY OF STUDY				
ANIMAL#	0	7	14	21	28
2501	99	89	83	79	69
2502	90	87	81	68	66
2503	96	84	76	75	64
2504	SF	76	70	77	70
2505	101	90	77	67	72
2506	100	84	74	73	74
2507	98	87	87	82	72
2508	108	86	83	80	76
2509	102	80	84	72	68
2510	92	82	77	77	77
2511	100	79	77	77	66
2512	94	79	76	74	66
MEAN	98	84	79	75	70
S.D.	4.8	4.3	4.9	4.6	4.2
N	11	12	12	12	12

SF=Spilled Feeder

APPENDIX E

PROPANE: COMBINED REPEATED-EXPOSURE TOXICITY, REPRODUCTION AND NEUROTOXICITY SCREENING IN RATS VIA WHOLE-BODY INHALATION EXPOSURES

INDIVIDUAL FEED CONSUMPTION (GRAMS/KG/DAY)

FEMALES GROUP 3 4000 PPM

	DAY OF STUDY				
ANIMAL#	0	7	14	21	28
3501	SF	83	79	73	69
3502	101	86	78	76	75
3503	90	81	84	70	65
3504	90	77	74	73	65
3505	103	86	80	71	68
3506	93	80	80	70	68
3507	86	73	72	69	69
3508	92	79	84	76	72
3509	95	78	76	79	67
3510	SF	82	CF	69	60
3511	93	72	71	73	68
3512	97	89	78	78	71
MEAN	94	81	78	73	68
S.D.	5.3	5.0	4.3	3.4	3.7
N	10	12	11	12	12

SF=Spilled Feeder CF=Contaminated Feeder

APPENDIX E

PROPANE: COMBINED REPEATED-EXPOSURE TOXICITY, REPRODUCTION AND NEUROTOXICITY SCREENING IN RATS VIA WHOLE-BODY INHALATION EXPOSURES

INDIVIDUAL FEED CONSUMPTION (GRAMS/KG/DAY)

FEMALES GROUP 4 12000 PPM

	DAY OF STUDY				
ANIMAL#	0	7	14	21	28
4501	94	85	83	77	67
4502	89	77	75	69	66
4503	SF	SF	SF	71	69
4504	85	74	69	65	64
4505	92	81	78	74	68
4506	93	82	77	75	69
4507	100	82	79	73	68
4508	87	76	74	70	62
4509	97	82	78	74	66
4510	98	82	79	75	67
4511	101	83	74	68	67
4512	CF	CF	83	76	71
MEAN	94	80	77	72	67
S.D.	5.4	3.4	4.1	3.7	2.3
N	10	10	11	12	12

SF=Spilled Feeder CF=Contaminated Feeder

	Individual Functional Observational Battery Evaluations Main Study Preface	Appendix F

Key:

REFLEX ASSESSMENTS

Audition Assessment: (Sound)	1 - Normal; flinches and/or flicks ears 2 - No reaction 3 - Exaggerated; jumps, flips, bites
Pain Perception: (Pain)	1 - Normal; turns and bites at the site or walks forward, away from the stimulus 2 - No reaction 3 - Increased pain; jumps forward, with or without vocalization, or exhibits highly exaggerated bizarre reaction, attacks, bites

GRIP STRENGTH[1]

Forelimb and hindlimb grip strength measured in grams of force.

RECTAL TEMPERATURE

Measured in centigrade.

[1]The means of Trials 1 and 2 were calculated and statistically evaluated in Table 5.

Males	Individual Functional Observational Battery Evaluations 4th Week of Exposure	Appendix F

Animal Number	Reflex Assessments		Grip Strength (grams)						Rectal Temperature (°C)
			Forelimb			Hindlimb			
	Sound	Pain	Trial 1	Trial 2	Mean	Trial 1	Trial 2	Mean	
Group 1 – 0 ppm									
1001	1	1	785	800	**793**	670	610	**640**	37.9
1002	1	1	1325	1140	**1233**	695	620	**658**	37.7
1003	1	1	1275	910	**1093**	820	730	**775**	39.1
1004	1	1	1060	950	**1005**	715	710	**713**	38.5
1005	1	1	1060	935	**998**	680	710	**695**	38.1
1006	1	1	570	980	**775**	560	715	**638**	36.7
1007	1	1	1045	1000	**1023**	605	665	**635**	35.5
1008	1	2	965	950	**958**	855	810	**833**	36.0
1009	1	2	1145	1210	**1178**	780	650	**715**	36.8
1010	1	1	1195	825	**1010**	660	735	**698**	36.2
1011	1	1	985	585	**785**	690	930	**810**	36.7
1012	1	2	680	825	**753**	695	630	**663**	37.8

Males	Individual Functional Observational Battery Evaluations 4th Week of Exposure	Appendix F

Animal Number	Reflex Assessments		Grip Strength (grams)						Rectal Temperature (°C)
			Forelimb			Hindlimb			
	Sound	Pain	Trial 1	Trial 2	Mean	Trial 1	Trial 2	Mean	
Group 2 – 1200 ppm									
2001	1	1	990	915	**953**	655	820	**738**	37.9
2002	1	1	1135	1390	**1263**	750	850	**800**	36.8
2003	1	1	1270	695	**983**	560	640	**600**	38.4
2004	1	1	945	925	**935**	775	585	**680**	38.2
2005	1	1	965	920	**943**	590	665	**628**	38.9
2006	1	1	1075	780	**928**	665	665	**665**	38.1
2007	1	1	1060	920	**990**	660	695	**678**	35.5
2008	1	1	1100	935	**1018**	660	605	**633**	36.2
2009	1	1	735	810	**773**	650	625	**638**	38.9
2010	1	1	940	985	**963**	610	670	**640**	39.3
2011	1	1	1045	1360	**1203**	685	660	**673**	36.9
2012	1	1	735	940	**838**	795	665	**730**	36.5

Males	Individual Functional Observational Battery Evaluations 4th Week of Exposure	Appendix F

Animal Number	Reflex Assessments		Grip Strength (grams)						Rectal Temperature (°C)
			Forelimb			Hindlimb			
	Sound	Pain	Trial 1	Trial 2	Mean	Trial 1	Trial 2	Mean	
Group 3 – 4000 ppm									
3001	1	1	650	960	**805**	1030	900	**965**	37.9
3002	1	1	595	805	**700**	750	690	**720**	38.1
3003	1	1	1040	1140	**1090**	1075	990	**1033**	38.7
3004	1	1	875	915	**895**	595	690	**643**	36.5
3005	1	2	1235	985	**1110**	700	775	**738**	36.6
3006	1	1	1175	1170	**1173**	915	705	**810**	37.5
3007	1	1	975	1140	**1058**	745	820	**783**	39.4
3008	1	1	875	700	**788**	795	695	**745**	36.7
3009	1	1	1315	1010	**1163**	810	795	**803**	36.3
3010	1	1	855	790	**823**	725	755	**740**	33.8
3011	1	1	805	950	**878**	880	760	**820**	38.4
3012	1	1	755	1065	**910**	705	710	**708**	35.9

Males	Individual Functional Observational Battery Evaluations 4th Week of Exposure	Appendix F

Animal Number	Reflex Assessments		Grip Strength (grams)						Rectal Temperature (°C)
			Forelimb			Hindlimb			
	Sound	Pain	Trial 1	Trial 2	Mean	Trial 1	Trial 2	Mean	
Group 4 – 12000 ppm									
4001	1	1	1000	885	**943**	950	800	**875**	38.5
4002	1	1	960	980	**970**	690	625	**658**	37.5
4003	1	1	935	1225	**1080**	630	650	**640**	34.7
4004	1	1	1030	1030	**1030**	610	690	**650**	38.4
4005	1	1	955	945	**950**	470	640	**555**	38.4
4006	1	1	1010	855	**933**	690	660	**675**	34.5
4007	1	1	560	915	**738**	620	765	**693**	35.8
4008	1	1	845	930	**888**	675	775	**725**	38.2
4009	1	1	1335	1260	**1298**	705	870	**788**	38.1
4010	1	1	1050	1000	**1025**	700	725	**713**	38.5
4011	1	1	800	930	**865**	955	640	**798**	38.0
4012	1	1	1050	1100	**1075**	570	530	**550**	34.0

Females	Individual Functional Observational Battery Evaluations 4th Week of Exposure	Appendix F

Animal Number	Reflex Assessments		Grip Strength (grams)						Rectal Temperature (°C)
			Forelimb			Hindlimb			
	Sound	Pain	Trial 1	Trial 2	Mean	Trial 1	Trial 2	Mean	
Group 1 – 0 ppm									
1501	1	1	755	780	**768**	615	825	**720**	39.7
1502	1	1	685	1040	**863**	735	635	**685**	38.4
1503	1	1	750	750	**750**	615	715	**665**	38.6
1504	1	1	705	895	**800**	520	450	**485**	37.4
1505	1	1	1165	825	**995**	705	685	**695**	39.4
1506	1	1	970	805	**888**	705	655	**680**	37.7
1507	1	1	870	1050	**960**	610	775	**693**	38.7
1508	1	1	650	995	**823**	630	780	**705**	34.5
1509	1	1	990	930	**960**	615	765	**690**	38.6
1510	1	1	800	910	**855**	670	670	**670**	38.4
1511	1	1	1035	765	**900**	620	610	**615**	38.6
1512	1	1	905	910	**908**	565	935	**750**	38.5

Females	Individual Functional Observational Battery Evaluations 4th Week of Exposure	Appendix F

Animal Number	Reflex Assessments		Grip Strength (grams)						Rectal Temperature (°C)
			Forelimb			Hindlimb			
	Sound	Pain	Trial 1	Trial 2	Mean	Trial 1	Trial 2	Mean	
Group 2 – 1200 ppm									
2501	1	1	1015	1050	**1033**	420	645	**533**	38.3
2502	1	1	1080	975	**1028**	620	610	**615**	36.8
2503	1	1	940	800	**870**	645	660	**653**	38.3
2504	1	1	1100	985	**1043**	505	720	**613**	38.0
2505	1	1	690	830	**760**	490	560	**525**	37.5
2506	1	1	910	1060	**985**	725	620	**673**	37.2
2507	1	1	915	1135	**1025**	705	740	**723**	38.9
2508	1	1	890	755	**823**	680	720	**700**	38.4
2509	1	1	860	1025	**943**	520	625	**573**	37.6
2510	1	1	730	795	**763**	545	455	**500**	39.4
2511	1	1	855	995	**925**	765	750	**758**	38.2
2512	1	1	925	785	**855**	795	610	**703**	38.5

Females	Individual Functional Observational Battery Evaluations 4th Week of Exposure	Appendix F

Animal Number	Reflex Assessments		Grip Strength (grams)						Rectal Temperature (°C)
			Forelimb			Hindlimb			
	Sound	Pain	Trial 1	Trial 2	Mean	Trial 1	Trial 2	Mean	
Group 3 – 4000 ppm									
3501	1	1	805	910	**858**	680	660	**670**	38.3
3502	1	1	580	825	**703**	540	595	**568**	39.3
3503	1	1	960	755	**858**	675	580	**628**	38.6
3504	1	1	890	1065	**978**	550	570	**560**	38.9
3505	1	1	1015	765	**890**	650	520	**585**	38.7
3506	1	1	985	1085	**1035**	700	585	**643**	39.1
3507	1	1	660	925	**793**	555	555	**555**	38.4
3508	1	1	990	1080	**1035**	760	540	**650**	37.6
3509	1	1	805	645	**725**	750	745	**748**	37.1
3510	1	1	1190	935	**1063**	835	655	**745**	38.4
3511	1	1	800	735	**768**	540	510	**525**	39.5
3512	1	1	675	780	**728**	575	550	**563**	38.4

Females	Individual Functional Observational Battery Evaluations 4th Week of Exposure	Appendix F

Animal Number	Reflex Assessments		Grip Strength (grams)						Rectal Temperature (°C)
			Forelimb			Hindlimb			
	Sound	Pain	Trial 1	Trial 2	Mean	Trial 1	Trial 2	Mean	
Group 4 – 12000 ppm									
4501	1	1	1030	720	**875**	690	580	**635**	37.8
4502	1	1	855	795	**825**	685	755	**720**	38.5
4503	1	1	1020	1050	**1035**	710	730	**720**	38.6
4504	1	1	930	900	**915**	635	700	**668**	38.2
4505	1	1	1000	1190	**1095**	575	560	**568**	38.0
4506	1	1	840	455	**648**	520	560	**540**	38.4
4507	1	1	930	865	**898**	610	710	**660**	38.9
4508	1	1	935	835	**885**	775	660	**718**	38.5
4509	1	2	990	965	**978**	570	570	**570**	38.3
4510	1	1	765	850	**808**	715	660	**688**	37.3
4511	1	1	950	1060	**1005**	690	725	**708**	37.8
4512	1	1	1115	1110	**1113**	690	785	**738**	38.4

Males	Individual Motor Activity Values[a] Main Study 4th Week of Exposure	Appendix G

Animal Number	Interval 1	2	3	4	5	6	7	8	9	10	11	12	Total
Group 1 – 0 ppm													
1001	148	106	85	46	94	4	0	4	0	0	0	33	520
1002	199	153	152	49	109	12	30	0	3	1	0	2	710
1003	205	113	183	89	153	111	15	27	0	6	0	0	902
1004	189	139	1	0	0	2	0	0	14	93	81	41	560
1005	171	126	140	105	3	26	1	0	0	0	4	0	576
1006	250	171	158	142	175	167	169	118	87	65	75	110	1687
1007	163	161	83	28	146	25	11	95	34	79	4	0	829
1008	247	169	264	153	89	38	57	53	0	0	0	0	1070
1009	163	145	160	153	119	119	131	109	107	73	0	5	1284
1010	158	120	111	88	13	80	4	0	0	0	0	0	574
1011	237	166	120	117	144	134	121	104	47	78	19	2	1289
1012	217	139	162	173	93	34	34	1	0	0	0	0	853
Mean	**195.6**	**142.3**	**134.9**	**95.3**	**94.8**	**62.7**	**47.8**	**42.6**	**24.3**	**32.9**	**15.3**	**16.1**	**904.5**
S.D.	**36.09**	**22.42**	**64.03**	**55.37**	**60.15**	**56.94**	**59.29**	**49.95**	**37.52**	**39.96**	**29.83**	**32.75**	**364.49**
N	**12**	**12**	**12**	**12**	**12**	**12**	**12**	**12**	**12**	**12**	**12**	**12**	**12**
Group 2 – 1200 ppm													
2001	218	220	173	9	3	4	2	6	0	4	0	4	643
2002	203	140	168	56	2	0	3	0	1	0	3	0	576
2003	150	56	48	85	70	0	4	0	2	5	9	6	435
2004	232	157	118	166	62	84	44	0	0	0	50	64	977
2005	203	175	134	131	104	82	102	62	10	0	42	108	1153
2006	186	137	122	60	80	44	28	2	0	0	9	0	668
2007	232	149	91	116	83	76	2	77	0	0	9	2	837
2008	221	125	106	94	11	0	0	0	0	3	7	3	570
2009	207	215	232	102	49	0	0	12	4	3	0	1	825
2010	182	218	190	114	164	80	143	97	92	113	41	43	1477
2011	174	260	122	214	33	68	21	0	0	1	0	24	917
2012	225	133	75	74	29	38	3	8	3	7	0	1	596
Mean	**202.8**	**165.4**	**131.6**	**101.8**	**57.5**	**39.7**	**29.3**	**22.0**	**9.3**	**11.3**	**14.2**	**21.3**	**806.2**
S.D.	**25.42**	**55.34**	**51.70**	**53.50**	**47.23**	**37.04**	**46.45**	**35.19**	**26.20**	**32.10**	**18.68**	**34.10**	**293.80**
N	**12**	**12**	**12**	**12**	**12**	**12**	**12**	**12**	**12**	**12**	**12**	**12**	**12**

[a]Number of beam breaks per interval.

Males	Individual Motor Activity Values[a] Main Study 4th Week of Exposure	Appendix G

Animal Number	Interval 1	2	3	4	5	6	7	8	9	10	11	12	Total
Group 3 – 4000 ppm													
3001	193	102	38	0	0	0	0	0	0	0	0	0	333
3002	227	132	45	62	1	1	1	0	0	0	0	0	469
3003	139	126	59	22	51	126	6	5	0	2	0	0	536
3004	285	123	116	109	71	82	61	2	1	0	28	80	958
3005	216	88	106	35	0	18	100	58	5	12	4	11	653
3006	153	59	100	34	25	143	111	60	5	0	53	0	743
3007	180	182	133	79	15	43	0	0	0	0	131	140	903
3008	232	148	134	154	155	43	100	188	127	109	85	2	1477
3009	224	174	152	122	135	88	62	32	18	0	64	0	1071
3010	133	100	114	34	3	0	14	0	0	0	0	0	398
3011	220	181	174	124	88	78	86	9	44	0	0	16	1020
3012	235	123	90	190	70	50	105	45	21	0	0	0	929
Mean	**203.1**	**128.2**	**105.1**	**80.4**	**51.2**	**56.0**	**53.8**	**33.3**	**18.4**	**10.3**	**30.4**	**20.8**	**790.8**
S.D.	**44.91**	**38.30**	**41.84**	**59.13**	**53.92**	**48.40**	**46.48**	**54.10**	**36.69**	**31.29**	**43.68**	**43.92**	**332.37**
N	**12**	**12**	**12**	**12**	**12**	**12**	**12**	**12**	**12**	**12**	**12**	**12**	**12**
Group 4 – 12000 ppm													
4001	183	104	108	111	100	77	9	118	26	0	0	14	850
4002	181	118	95	7	4	3	0	6	0	0	4	1	419
4003	175	162	203	74	1	87	10	0	0	0	22	95	829
4004	87	94	164	78	50	0	0	9	81	62	0	94	719
4005	242	111	147	53	54	7	0	0	0	0	62	103	779
4006	216	158	109	104	115	71	28	0	0	0	0	0	801
4007	135	126	104	32	79	0	3	0	0	1	6	0	486
4008	197	169	160	63	114	87	54	2	0	0	0	5	851
4009	267	162	169	87	76	78	0	2	20	3	0	18	882
4010	214	172	130	144	67	61	1	0	0	1	2	2	794
4011	211	166	44	16	2	46	102	75	15	0	0	12	689
4012	173	136	177	151	84	108	81	111	78	6	0	9	1114
Mean	**190.1**	**139.8**	**134.2**	**76.7**	**62.2**	**52.1**	**24.0**	**26.9**	**18.3**	**6.1**	**8.0**	**29.4**	**767.8**
S.D.	**47.34**	**28.25**	**44.13**	**46.10**	**41.39**	**39.54**	**35.60**	**46.02**	**30.02**	**17.70**	**18.13**	**41.41**	**181.38**
N	**12**	**12**	**12**	**12**	**12**	**12**	**12**	**12**	**12**	**12**	**12**	**12**	**12**

[a]Number of beam breaks per interval.

Females	Individual Motor Activity Values[a] Main Study 4th Week of Exposure	Appendix G

Animal Number	Interval 1	2	3	4	5	6	7	8	9	10	11	12	Total
Group 1 – 0 ppm													
1501	150	135	97	126	44	106	55	71	7	0	4	0	795
1502	198	155	113	95	85	82	12	29	12	0	0	0	781
1503	211	115	108	85	114	68	66	40	52	95	106	52	1112
1504	229	177	132	125	120	141	67	74	48	0	35	79	1227
1505	127	48	105	55	121	106	22	0	0	0	16	43	643
1506	145	152	111	95	96	47	9	1	1	5	4	0	666
1507	161	85	129	147	69	38	0	0	0	0	2	0	631
1508	180	132	86	162	84	118	95	21	0	0	0	14	892
1509	133	102	97	88	62	83	32	1	0	15	48	0	661
1510	148	116	103	52	13	2	0	60	11	2	0	0	507
1511	127	110	164	86	89	84	65	86	56	6	52	85	1010
1512	203	153	93	129	8	51	178	38	62	12	0	75	1002
Mean	**167.7**	**123.3**	**111.5**	**103.8**	**75.4**	**77.2**	**50.1**	**35.1**	**20.8**	**11.3**	**22.3**	**29.0**	**827.3**
S.D.	**35.33**	**35.29**	**21.37**	**34.34**	**38.11**	**38.58**	**50.84**	**31.72**	**25.47**	**26.87**	**32.78**	**35.35**	**221.74**
N	**12**	**12**	**12**	**12**	**12**	**12**	**12**	**12**	**12**	**12**	**12**	**12**	**12**
Group 2 – 1200 ppm													
2501	128	89	112	68	13	0	2	7	0	0	0	0	419
2502	179	130	66	40	0	0	0	1	0	0	0	1	417
2503	98	65	75	60	64	3	0	0	0	0	0	0	365
2504	176	75	42	103	8	9	10	0	2	0	2	50	477
2505	184	139	70	58	86	92	103	73	0	0	27	34	866
2506	182	105	94	85	43	69	0	0	0	0	0	0	578
2507	130	137	119	99	47	29	72	46	66	39	2	0	786
2508	201	159	75	46	33	0	0	0	0	0	4	4	522
2509	167	167	141	109	57	3	12	70	88	121	37	0	972
2510	228	152	89	112	100	71	89	164	87	0	0	0	1092
2511	182	132	116	128	81	58	145	1	27	0	0	0	870
2512	102	91	87	35	25	101	51	10	15	0	2	1	520
Mean	**163.1**	**120.1**	**90.5**	**78.6**	**46.4**	**36.3**	**40.3**	**31.0**	**23.8**	**13.3**	**6.2**	**7.5**	**657.0**
S.D.	**39.92**	**34.01**	**27.56**	**31.43**	**32.27**	**39.31**	**50.51**	**50.33**	**35.49**	**35.71**	**12.32**	**16.51**	**246.67**
N	**12**	**12**	**12**	**12**	**12**	**12**	**12**	**12**	**12**	**12**	**12**	**12**	**12**

[a]Number of beam breaks per interval

Females	Individual Motor Activity Values[a] Main Study 4th Week of Exposure	Appendix G

Animal Number	Interval 1	2	3	4	5	6	7	8	9	10	11	12	Total
Group 3 – 4000 ppm													
3501	187	115	107	49	24	82	78	74	1	0	0	2	719
3502	113	99	65	49	5	0	0	0	0	2	0	6	339
3503	163	118	125	109	17	27	3	0	0	0	12	136	710
3504	147	130	87	64	59	19	5	4	2	0	40	35	592
3505	181	133	72	68	62	25	9	4	0	0	43	87	684
3506	128	98	131	84	92	54	61	121	5	0	0	0	774
3507	176	106	189	93	125	41	17	8	2	0	3	0	760
3508	171	125	132	79	131	149	59	54	46	24	5	12	987
3509	164	149	120	134	140	20	0	9	0	7	1	0	744
3510	151	124	149	119	71	108	77	76	121	30	6	0	1032
3511	193	150	70	59	161	101	135	63	103	139	14	25	1213
3512	179	133	95	136	82	39	0	0	1	0	0	0	665
Mean	**162.8**	**123.3**	**111.8**	**86.9**	**80.8**	**55.4**	**37.0**	**34.4**	**23.4**	**16.8**	**10.3**	**25.3**	**768.3**
S.D.	**24.15**	**17.15**	**36.68**	**31.32**	**50.90**	**44.89**	**44.12**	**41.28**	**43.51**	**39.83**	**15.31**	**43.12**	**224.58**
N	**12**	**12**	**12**	**12**	**12**	**12**	**12**	**12**	**12**	**12**	**12**	**12**	**12**
Group 4 – 12000 ppm													
4501	172	234	159	162	141	132	170	79	28	7	0	0	1284
4502	142	89	70	28	15	0	0	0	0	0	0	15	359
4503	126	120	62	98	69	86	115	103	75	38	0	0	892
4504	185	137	87	38	2	0	0	0	3	4	76	99	631
4505	170	75	20	0	0	0	0	0	0	30	105	58	458
4506	183	135	119	84	61	22	25	0	0	1	1	0	631
4507	154	94	97	37	12	0	1	0	0	0	0	2	397
4508	147	124	49	133	55	0	0	0	0	75	71	16	670
4509	107	101	93	102	121	90	22	1	3	1	1	2	644
4510	154	120	116	111	94	111	54	6	0	0	0	3	769
4511	143	95	142	81	31	11	113	149	65	119	92	13	1054
4512	110	62	87	72	44	72	47	30	98	16	11	19	668
Mean	**149.4**	**115.5**	**91.8**	**78.8**	**53.8**	**43.7**	**45.6**	**30.7**	**22.7**	**24.3**	**29.8**	**18.9**	**704.8**
S.D.	**25.89**	**44.00**	**39.06**	**46.79**	**46.19**	**50.59**	**57.36**	**51.08**	**35.79**	**37.41**	**42.44**	**30.00**	**267.81**
N	**12**	**12**	**12**	**12**	**12**	**12**	**12**	**12**	**12**	**12**	**12**	**12**	**12**

[a]Number of beam breaks per interval

	Individual Hematology Values Main Study Preface	Appendix H

Abbreviation	Parameter	Reporting Units
HGB	Hemoglobin Concentration	g/dL
HCT	Hematocrit	percent
RBC	Erythrocyte Count	10^6/µL
RETIC	Reticulocyte Count	10^9/L
PLT	Platelet Count	10^3/µL
MCV	Mean Corpuscular Volume	fL
MCH	Mean Corpuscular Hemoglobin	pg
MCHC	Mean Corpuscular Hemoglobin Concentration	g/dL
WBC	Total Leukocyte Count	10^3/µL
ANEU	Absolute Neutrophils	10^3/µL
ALYM	Absolute Lymphocytes	10^3/µL
AMONO	Absolute Monocytes	10^3/µL
AEOS	Absolute Eosinophils	10^3/µL
ABASO	Absolute Basophils	10^3/µL
ALUC	Absolute Large Unstained Cells	10^3/µL

ERYTHROCYTE MORPHOLOGY

Abbreviation	Cell Morphology	Range
Poly	Polychromasia	1+ = few
Poik	Poikilocytosis	2+ = slight
		NAN = No abnormalities noted

PLATELET MORPHOLOGY (PLT MORPH)

Abbreviation	Definition
CLSL	Slight Platelet Clumping Noted
LPO	Occasional Large Platelets noted
NAN	No abnormalities noted
NV	Non-valid result

Huntingdon Life Sciences Study No. 03-4245
Individual Hematology Values - Termination
Appendix H - Main Study

Group	Animal Number	HGB	HCT	RBC	RETIC	PLT	MCV	MCH	MCHC	WBC
		g/dL	%	x10^6/uL	x10^9/L	x10^3/uL	fL	pg	g/dL	x10^3/uL
1M	1001	13.9	43.7	7.32	392.1	1292	59.7	19.0	31.7	12.03
0 ppm	1002	15.2	46.1	7.84	182.8	825	58.8	19.4	33.0	15.90
	1003	16.1	49.6	8.67	180.5	1030	57.3	18.6	32.5	9.28
	1004	16.3	48.0	8.46	174.4	819	56.7	19.3	33.9	12.52
	1005	16.0	47.6	8.34	150.7	860	57.1	19.2	33.6	16.46
	1006	15.3	46.7	8.71	157.5	843	53.6	17.6	32.7	16.64
	1007	15.4	47.6	8.32	215.6	855	57.2	18.5	32.3	18.21
	1008	15.8	48.1	8.43	170.2	938	57.1	18.8	32.9	14.98
	1009	15.4	47.0	8.50	143.1	873	55.3	18.1	32.8	17.79
	1010	15.5	47.0	8.15	161.0	1121	57.7	19.0	33.0	22.36
	1011	15.4	45.9	7.56	150.6	1123	60.7	20.3	33.5	18.60
	1012	15.4	46.4	8.16	152.3	391	56.8	18.9	33.3	11.04
	Mean	15.5	47.0	8.21	185.9	914	57.3	18.9	32.9	15.48
	SD	0.61	1.45	0.431	67.88	223.0	1.86	0.68	0.61	3.710
	n	12	12	12	12	12	12	12	12	12

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Individual Hematology Values - Termination
Appendix H - Main Study

Group	Animal Number	ANEU	ALYM	AMONO	AEOS	ABASO	ALUC	Poik	Poly	PLT MORPH
		x10^3/uL	x10^3/uL	x10^3/uL	x10^3/uL	x10^3/uL	x10^3/uL			
1M	1001	1.85	9.83	0.17	0.03	0.08	0.07	NAN	1+	NAN
0 ppm	1002	1.62	13.66	0.24	0.14	0.14	0.09	1+	1+	NAN
	1003	1.36	7.54	0.15	0.09	0.07	0.07	1+	1+	NAN
	1004	1.27	10.82	0.14	0.07	0.13	0.10	1+	1+	NAN
	1005	1.51	14.41	0.21	0.11	0.15	0.06	1+	1+	NAN
	1006	1.63	14.34	0.25	0.18	0.14	0.10	1+	1+	LPO
	1007	2.21	15.32	0.29	0.09	0.17	0.13	NAN	1+	NAN
	1008	1.29	13.15	0.22	0.11	0.14	0.06	NAN	1+	LPO
	1009	1.49	15.64	0.26	0.09	0.17	0.14	NAN	1+	NAN
	1010	3.72	17.58	0.66	0.06	0.20	0.13	NAN	1+	NAN
	1011	1.13	16.77	0.26	0.06	0.20	0.17	1+	1+	NAN
	1012	2.06	8.46	0.13	0.25	0.08	0.07	NAN	1+	CLSL
	Mean	1.76	13.13	0.25	0.11	0.14	0.10			
	SD	0.696	3.259	0.140	0.060	0.044	0.036			
	n	12	12	12	12	12	12			

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Group	Animal Number	HGB	HCT	RBC	RETIC	PLT	MCV	MCH	MCHC	WBC
		g/dL	%	x10^6/uL	x10^9/L	x10^3/uL	fL	pg	g/dL	x10^3/uL
2M	2001	16.2	48.9	8.66	198.3	940	56.5	18.7	33.1	22.12
1200 ppm	2002	15.2	46.0	8.07	162.0	977	57.0	18.8	32.9	15.56
	2003	16.0	47.0	8.26	138.3	778	56.8	19.4	34.1	13.09
	2004	16.1	48.5	8.29	167.7	1032	58.5	19.4	33.2	11.85
	2005	15.4	46.4	8.16	191.6	1024	56.8	18.8	33.2	14.21
	2006	15.7	48.0	7.97	203.7	907	60.2	19.7	32.7	10.94
	2007	15.9	47.6	8.23	174.8	867	57.9	19.3	33.3	10.11
	2008	15.3	45.5	7.99	160.9	792	56.9	19.1	33.6	8.77
	2009	16.1	49.4	8.65	226.7	675	57.1	18.6	32.6	12.71
	2010	15.4	46.3	8.21	154.9	696	56.4	18.8	33.3	9.78
	2011	15.5	46.7	8.36	161.9	700	55.9	18.6	33.2	14.97
	2012	15.3	47.0	8.13	213.2	715	57.9	18.9	32.6	11.87
	Mean	15.7	47.3	8.25	179.5	842	57.3	19.0	33.2	13.00
	SD	0.37	1.22	0.223	26.76	132.8	1.16	0.36	0.43	3.550
	n	12	12	12	12	12	12	12	12	12

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Appendix H - Main Study

Group	Animal Number	ANEU	ALYM	AMONO	AEOS	ABASO	ALUC	Poik	Poly	PLT MORPH
		x10^3/uL	x10^3/uL	x10^3/uL	x10^3/uL	x10^3/uL	x10^3/uL			
2M	2001	2.34	18.97	0.22	0.14	0.23	0.22	1+	1+	NAN
1200 ppm	2002	2.29	12.64	0.30	0.12	0.12	0.09	1+	1+	NAN
	2003	2.27	10.36	0.16	0.15	0.10	0.05	NAN	1+	NAN
	2004	2.03	9.29	0.30	0.06	0.12	0.06	1+	1+	NAN
	2005	2.88	10.82	0.19	0.16	0.10	0.06	1+	1+	LPO
	2006	1.44	9.11	0.15	0.08	0.07	0.09	1+	1+	NAN
	2007	1.32	8.27	0.16	0.22	0.09	0.04	1+	1+	NAN
	2008	1.78	6.48	0.20	0.20	0.07	0.04	1+	1+	NAN
	2009	1.06	9.57	1.98	0.00	0.09	0.01	1+	1+	NAN
	2010	1.65	7.80	0.11	0.13	0.05	0.04	1+	1+	NAN
	2011	2.19	12.22	0.17	0.19	0.12	0.07	1+	1+	NAN
	2012	1.91	9.25	0.33	0.26	0.08	0.05	1+	1+	NAN
	Mean	1.93	10.40	0.36	0.14	0.10	0.07			
	SD	0.510	3.213	0.516	0.072	0.046	0.053			
	n	12	12	12	12	12	12			

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Group	Animal Number	HGB	HCT	RBC	RETIC	PLT	MCV	MCH	MCHC	WBC
		g/dL	%	x10^6/uL	x10^9/L	x10^3/uL	fL	pg	g/dL	x10^3/uL
3M	3001	15.2	47.0	8.09	209.1	NV	58.1	18.7	32.3	14.63
4000 ppm	3002	16.5	50.7	8.63	182.9	847	58.8	19.1	32.5	11.54
	3003	14.6	43.3	7.39	147.2	971	58.5	19.8	33.8	20.98
	3004	15.8	47.6	8.05	152.3	1019	59.1	19.7	33.3	15.36
	3005	15.3	46.3	7.63	181.2	930	60.7	20.1	33.1	12.29
	3006	15.8	48.4	8.02	160.9	974	60.3	19.7	32.6	9.88
	3007	16.0	48.1	8.65	186.0	871	55.6	18.5	33.2	12.16
	3008	15.7	47.6	8.45	147.0	755	56.3	18.6	33.1	19.48
	3009	15.0	44.7	7.61	162.0	912	58.8	19.7	33.5	14.85
	3010	16.4	49.8	8.73	148.4	663	57.0	18.8	32.9	14.39
	3011	16.1	49.1	8.59	143.8	751	57.1	18.7	32.8	9.90
	3012	16.1	48.1	8.25	166.5	578	58.4	19.6	33.5	9.93
	Mean	15.7	47.6	8.17	165.6	843	58.2	19.3	33.1	13.78
	SD	0.58	2.06	0.455	20.27	140.2	1.52	0.57	0.45	3.618
	n	12	12	12	12	11	12	12	12	12

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Group	Animal Number	ANEU	ALYM	AMONO	AEOS	ABASO	ALUC	Poik	Poly	PLT MORPH
		x10^3/uL	x10^3/uL	x10^3/uL	x10^3/uL	x10^3/uL	x10^3/uL			
3M	3001	3.06	10.90	0.19	0.24	0.14	0.09	1+	1+	NAN
4000 ppm	3002	1.32	9.78	0.21	0.09	0.10	0.05	1+	1+	LPO
	3003	2.65	17.49	0.36	0.12	0.21	0.14	1+	1+	NAN
	3004	1.96	12.61	0.41	0.13	0.15	0.09	1+	1+	NAN
	3005	2.01	9.82	0.20	0.08	0.07	0.10	1+	1+	NAN
	3006	1.49	8.04	0.14	0.07	0.08	0.05	NAN	1+	LPO
	3007	1.39	10.23	0.23	0.17	0.10	0.05	1+	1+	NAN
	3008	3.39	14.77	0.41	0.55	0.23	0.13	1+	1+	LPO
	3009	3.13	11.05	0.26	0.18	0.13	0.09	1+	1+	LPO
	3010	1.83	11.77	0.35	0.25	0.11	0.09	NAN	1+	NAN
	3011	2.22	7.33	0.18	0.07	0.07	0.03	1+	1+	NAN
	3012	1.78	7.70	0.21	0.12	0.07	0.05	1+	1+	LPO
	Mean	2.19	10.96	0.26	0.17	0.12	0.08			
	SD	0.711	2.956	0.094	0.134	0.054	0.034			
	n	12	12	12	12	12	12			

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Group	Animal Number	HGB	HCT	RBC	RETIC	PLT	MCV	MCH	MCHC	WBC
		g/dL	%	x10^6/uL	x10^9/L	x10^3/uL	fL	pg	g/dL	x10^3/uL
4M	4001	15.5	47.3	8.59	123.7	1290	55.0	18.0	32.7	12.34
12000 ppm	4002	16.2	50.1	9.14	141.7	1007	54.8	17.7	32.4	15.07
	4003	15.2	45.0	7.94	153.7	744	56.6	19.2	33.9	9.76
	4004	15.7	47.3	8.70	164.6	1037	54.4	18.1	33.3	14.80
	4005	15.7	48.1	8.54	228.6	747	56.3	18.4	32.7	14.50
	4006	15.9	48.2	8.45	178.4	856	57.1	18.8	32.9	14.25
	4007	15.4	46.1	7.90	147.6	771	58.3	19.5	33.4	13.09
	4008	15.1	45.9	8.01	124.5	828	57.3	18.9	32.9	13.67
	4009	15.8	48.1	8.40	144.6	680	57.3	18.8	32.8	13.51
	4010	15.2	46.1	8.18	175.0	861	56.4	18.5	32.9	12.22
	4011	14.3	43.7	7.79	164.3	919	56.2	18.4	32.8	10.74
	4012	16.0	47.9	8.54	157.4	926	56.1	18.7	33.4	12.27
	Mean	15.5	47.0	8.35	158.7	889	56.3	18.6	33.0	13.02
	SD	0.51	1.71	0.395	28.02	166.0	1.14	0.51	0.41	1.630
	n	12	12	12	12	12	12	12	12	12

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Group	Animal Number	ANEU	ALYM	AMONO	AEOS	ABASO	ALUC	Poik	Poly	PLT MORPH
		x10^3/uL	x10^3/uL	x10^3/uL	x10^3/uL	x10^3/uL	x10^3/uL			
4M	4001	2.35	9.39	0.24	0.19	0.12	0.05	NAN	1+	NAN
12000 ppm	4002	2.40	12.01	0.29	0.12	0.13	0.11	1+	1+	NAN
	4003	1.43	8.00	0.13	0.08	0.07	0.04	1+	1+	NAN
	4004	2.18	12.16	0.19	0.04	0.13	0.11	1+	1+	NAN
	4005	3.66	9.85	0.46	0.33	0.12	0.08	1+	1+	LPO
	4006	1.74	12.03	0.22	0.07	0.12	0.07	NAN	1+	NAN
	4007	1.08	11.59	0.14	0.05	0.12	0.12	1+	1+	NAN
	4008	1.64	11.15	0.18	0.12	0.12	0.45	1+	1+	LPO
	4009	2.35	10.44	0.23	0.30	0.13	0.07	1+	1+	NAN
	4010	1.87	9.82	0.27	0.11	0.09	0.07	1+	1+	NAN
	4011	1.54	8.90	0.11	0.08	0.05	0.07	1+	1+	NAN
	4012	1.45	10.37	0.23	0.07	0.09	0.05	1+	1+	NAN
	Mean	1.97	10.48	0.22	0.13	0.11	0.11			
	SD	0.680	1.346	0.093	0.095	0.026	0.111			
	n	12	12	12	12	12	12			

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Appendix H - Main Study

Group	Animal Number	HGB	HCT	RBC	RETIC	PLT	MCV	MCH	MCHC	WBC
		g/dL	%	x10^6/uL	x10^9/L	x10^3/uL	fL	pg	g/dL	x10^3/uL
1F	1501	15.1	45.3	8.05	162.7	1048	56.3	18.7	33.2	10.39
0 ppm	1502	16.0	46.9	8.24	167.8	1063	56.9	19.5	34.2	12.33
	1503	15.0	44.5	7.82	154.8	772	56.9	19.2	33.7	12.53
	1504	15.1	44.7	8.24	112.0	828	54.3	18.4	33.8	13.90
	1505	14.4	43.6	7.63	194.6	850	57.2	18.9	33.0	13.14
	1506	15.2	45.8	8.22	143.0	939	55.7	18.5	33.3	10.40
	1507	15.0	45.6	8.02	186.9	889	56.9	18.7	32.9	13.96
	1508	16.0	47.3	8.56	145.5	871	55.3	18.7	33.8	10.99
	1509	14.9	44.7	7.67	164.8	863	58.3	19.4	33.2	10.70
	1510	15.5	45.9	7.76	125.3	1041	59.1	20.0	33.8	23.73
	1511	14.9	44.2	8.17	170.2	774	54.1	18.3	33.8	10.51
	1512	14.3	43.0	7.41	198.4	877	58.1	19.3	33.2	13.61
	Mean	15.1	45.1	7.98	160.5	901	56.6	19.0	33.5	13.02
	SD	0.52	1.27	0.329	26.32	101.2	1.54	0.51	0.41	3.656
	n	12	12	12	12	12	12	12	12	12

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Group	Animal Number	ANEU	ALYM	AMONO	AEOS	ABASO	ALUC	Poik	Poly	PLT MORPH
		x10^3/uL	x10^3/uL	x10^3/uL	x10^3/uL	x10^3/uL	x10^3/uL			
1F	1501	1.02	8.99	0.12	0.14	0.07	0.05	1+	1+	NAN
0 ppm	1502	2.09	9.68	0.25	0.13	0.10	0.08	1+	1+	LPO
	1503	1.15	10.88	0.23	0.10	0.10	0.07	NAN	1+	NAN
	1504	1.27	12.04	0.24	0.19	0.10	0.07	2+	1+	LPO
	1505	2.55	10.04	0.23	0.18	0.10	0.05	2+	1+	NAN
	1506	2.73	6.97	0.22	0.33	0.07	0.07	2+	1+	NAN
	1507	1.31	12.03	0.30	0.06	0.12	0.14	2+	1+	NAN
	1508	1.72	8.67	0.29	0.16	0.09	0.06	1+	1+	LPO
	1509	1.50	8.77	0.14	0.14	0.09	0.07	2+	1+	LPO
	1510	1.71	21.10	0.35	0.16	0.26	0.16	1+	1+	LPO
	1511	2.53	7.51	0.17	0.20	0.06	0.04	1+	1+	LPO
	1512	1.67	11.36	0.20	0.19	0.10	0.11	2+	1+	NAN
	Mean	1.77	10.67	0.23	0.17	0.11	0.08			
	SD	0.581	3.674	0.066	0.066	0.052	0.037			
	n	12	12	12	12	12	12			

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Group	Animal Number	HGB	HCT	RBC	RETIC	PLT	MCV	MCH	MCHC	WBC
		g/dL	%	x10^6/uL	x10^9/L	x10^3/uL	fL	pg	g/dL	x10^3/uL
2F	2501	15.3	45.8	8.18	118.4	767	56.0	18.7	33.4	11.54
1200 ppm	2502	15.7	47.2	8.35	170.5	961	56.5	18.8	33.3	14.22
	2503	16.0	49.1	8.47	165.8	954	57.9	18.9	32.6	8.18
	2504	16.6	49.6	8.59	200.3	680	57.7	19.3	33.5	14.46
	2505	14.8	45.4	7.94	145.8	948	57.1	18.6	32.5	12.21
	2506	15.6	45.5	8.10	154.7	824	56.2	19.3	34.3	17.96
	2507	15.1	44.3	7.78	162.1	646	56.9	19.4	34.1	13.02
	2508	15.4	45.0	7.81	133.6	794	57.6	19.8	34.3	19.61
	2509	14.4	42.5	7.59	194.2	701	56.0	19.0	34.0	19.99
	2510	15.6	45.9	8.22	216.1	699	55.8	19.0	34.0	12.26
	2511	14.7	42.9	7.57	107.8	831	56.6	19.4	34.2	17.49
	2512	15.5	46.0	8.31	184.2	639	55.4	18.6	33.6	14.56
	Mean	15.4	45.8	8.08	162.8	787	56.6	19.1	33.7	14.63
	SD	0.60	2.13	0.337	32.98	119.2	0.81	0.37	0.62	3.545
	n	12	12	12	12	12	12	12	12	12

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Group	Animal Number	ANEU	ALYM	AMONO	AEOS	ABASO	ALUC	Poik	Poly	PLT MORPH
		x10^3/uL	x10^3/uL	x10^3/uL	x10^3/uL	x10^3/uL	x10^3/uL			
2F	2501	1.15	9.68	0.38	0.16	0.08	0.09	NAN	1+	NAN
1200 ppm	2502	1.71	11.81	0.27	0.24	0.11	0.08	2+	1+	NAN
	2503	0.85	6.95	0.20	0.07	0.06	0.06	NAN	1+	LPO
	2504	1.59	11.98	0.18	0.50	0.13	0.08	1+	1+	NAN
	2505	2.30	9.26	0.30	0.19	0.10	0.07	1+	1+	NAN
	2506	2.19	14.93	0.36	0.22	0.15	0.12	1+	1+	NAN
	2507	2.38	9.87	0.23	0.36	0.10	0.06	2+	1+	NAN
	2508	1.43	17.30	0.31	0.21	0.20	0.17	2+	1+	NAN
	2509	2.44	16.68	0.44	0.13	0.18	0.12	2+	1+	CLSL
	2510	0.84	10.92	0.19	0.14	0.09	0.08	1+	1+	NAN
	2511	1.10	15.67	0.29	0.11	0.18	0.14	1+	1+	LPO
	2512	1.68	12.31	0.25	0.18	0.10	0.05	1+	1+	LPO
	Mean	1.64	12.28	0.28	0.21	0.12	0.09			
	SD	0.586	3.238	0.080	0.118	0.045	0.037			
	n	12	12	12	12	12	12			

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Group	Animal Number	HGB	HCT	RBC	RETIC	PLT	MCV	MCH	MCHC	WBC
		g/dL	%	x10^6/uL	x10^9/L	x10^3/uL	fL	pg	g/dL	x10^3/uL
3F	3501	15.9	46.9	8.39	126.2	1098	55.9	19.0	34.0	14.71
4000 ppm	3502	15.4	46.0	8.26	180.5	996	55.7	18.6	33.4	16.44
	3503	15.5	46.3	8.39	141.7	579	55.2	18.4	33.3	12.05
	3504	15.9	48.0	8.60	186.0	829	55.8	18.5	33.1	13.84
	3505	15.3	44.2	7.97	156.9	763	55.5	19.2	34.6	14.81
	3506	15.4	45.7	8.30	168.0	1177	55.1	18.6	33.7	10.03
	3507	16.0	45.3	8.10	189.0	691	56.0	19.7	35.2	11.98
	3508	15.6	46.5	8.13	231.7	753	57.2	19.2	33.6	9.29
	3509	13.8	41.7	7.44	150.8	841	56.0	18.6	33.1	16.67
	3510	14.8	44.5	8.22	197.8	686	54.1	18.1	33.4	9.76
	3511	15.4	46.1	7.88	132.8	889	58.5	19.5	33.4	14.28
	3512	14.9	43.9	7.87	186.0	791	55.7	18.9	33.9	10.40
	Mean	15.3	45.4	8.13	170.6	841	55.9	18.9	33.7	12.86
	SD	0.60	1.66	0.308	30.46	175.0	1.09	0.48	0.63	2.618
	n	12	12	12	12	12	12	12	12	12

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Individual Hematology Values - Termination
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Group	Animal Number	ANEU	ALYM	AMONO	AEOS	ABASO	ALUC	Poik	Poly	PLT MORPH
		x10^3/uL	x10^3/uL	x10^3/uL	x10^3/uL	x10^3/uL	x10^3/uL			
3F	3501	1.29	12.81	0.22	0.20	0.13	0.07	1+	1+	NAN
4000 ppm	3502	1.65	14.14	0.25	0.18	0.14	0.09	1+	1+	NAN
	3503	1.78	9.54	0.18	0.38	0.09	0.08	1+	1+	NAN
	3504	1.92	11.29	0.26	0.14	0.13	0.10	1+	1+	NAN
	3505	2.72	11.48	0.34	0.06	0.12	0.09	1+	1+	NAN
	3506	1.67	7.85	0.23	0.13	0.06	0.09	1+	1+	NAN
	3507	1.14	10.20	0.24	0.24	0.08	0.09	1+	1+	LPO
	3508	1.33	7.56	0.18	0.13	0.05	0.04	1+	1+	NAN
	3509	1.83	14.18	0.26	0.10	0.14	0.15	1+	1+	LPO
	3510	0.96	8.32	0.21	0.16	0.06	0.05	1+	1+	NAN
	3511	1.42	12.16	0.19	0.29	0.11	0.11	1+	1+	NAN
	3512	1.42	8.44	0.24	0.20	0.06	0.04	1+	1+	NAN
	Mean	1.59	10.66	0.23	0.18	0.10	0.08			
	SD	0.458	2.371	0.044	0.087	0.035	0.031			
	n	12	12	12	12	12	12			

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Individual Hematology Values - Termination
Appendix H - Main Study

Group	Animal Number	HGB	HCT	RBC	RETIC	PLT	MCV	MCH	MCHC	WBC
		g/dL	%	x10^6/uL	x10^9/L	x10^3/uL	fL	pg	g/dL	x10^3/uL
4F	4501	15.6	47.2	8.29	132.8	851	56.9	18.8	33.0	14.27
12000 ppm	4502	15.8	46.3	8.00	130.3	572	57.8	19.8	34.2	12.67
	4503	16.2	48.3	8.35	161.0	794	57.9	19.5	33.6	14.08
	4504	15.8	46.7	8.31	150.8	570	56.2	19.0	33.8	15.38
	4505	15.9	47.2	8.43	150.8	586	56.0	18.9	33.7	14.93
	4506	16.4	47.9	8.41	200.7	923	56.9	19.5	34.2	15.68
	4507	15.5	47.1	8.19	201.4	813	57.5	18.9	32.9	14.95
	4508	15.7	46.7	8.38	162.8	772	55.8	18.7	33.5	10.24
	4509	15.7	46.7	8.39	183.7	990	55.7	18.8	33.7	11.51
	4510	15.2	46.1	8.50	130.6	1262	54.3	17.9	32.9	13.76
	4511	15.5	46.4	7.99	144.2	433	58.0	19.5	33.5	18.46
	4512	14.7	44.5	7.95	152.7	720	56.0	18.5	32.9	11.86
	Mean	15.7	46.8	8.27	158.5	774	56.6	19.0	33.5	13.98
	SD	0.44	0.96	0.189	24.99	224.0	1.12	0.53	0.48	2.199
	n	12	12	12	12	12	12	12	12	12

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Appendix H - Main Study

Group	Animal Number	ANEU	ALYM	AMONO	AEOS	ABASO	ALUC	Poik	Poly	PLT MORPH
		x10^3/uL	x10^3/uL	x10^3/uL	x10^3/uL	x10^3/uL	x10^3/uL			
4F	4501	1.93	11.65	0.28	0.19	0.12	0.11	1+	1+	NAN
12000 ppm	4502	1.97	9.98	0.35	0.17	0.10	0.10	1+	1+	NAN
	4503	2.24	10.73	0.29	0.61	0.12	0.09	1+	1+	CLSL
	4504	1.97	12.69	0.24	0.22	0.18	0.07	1+	1+	NAN
	4505	1.24	13.04	0.18	0.25	0.13	0.08	1+	1+	NAN
	4506	1.77	12.91	0.39	0.29	0.16	0.18	1+	1+	NAN
	4507	1.97	12.08	0.42	0.28	0.12	0.08	2+	1+	NAN
	4508	1.43	8.19	0.20	0.26	0.08	0.07	2+	1+	NAN
	4509	1.65	9.29	0.19	0.22	0.11	0.06	2+	1+	NAN
	4510	2.18	11.03	0.24	0.14	0.10	0.08	1+	1+	NAN
	4511	2.59	14.76	0.30	0.47	0.22	0.12	1+	1+	CLSL
	4512	2.08	9.04	0.23	0.41	0.06	0.04	2+	1+	NAN
	Mean	1.92	11.28	0.28	0.29	0.13	0.09			
	SD	0.363	1.936	0.078	0.138	0.044	0.036			
	n	12	12	12	12	12	12			

	Individual Coagulation Values Main Study Preface	Appendix I

Abbreviation	Parameter	Reporting Units
PT	Prothrombin Time	seconds
APTT	Activated Partial Thromboplastin Time	seconds

Huntingdon Life Sciences Study No. 03-4245
Individual Coagulation Values - Termination
Appendix I - Main Study

Group	Animal Number	PT	APTT
		Seconds	Seconds
1M	1001	12.5	20.4
0 ppm	1002	12.2	23.6
	1003	13.6	22.0
	1004	14.8	26.3
	1005	13.7	23.9
	1006	12.8	24.5
	1007	13.7	23.3
	1008	16.8	23.6
	1009	15.1	24.4
	1010	15.1	23.2
	1011	13.0	22.7
	1012	15.0	26.6
	Mean	14.0	23.7
	SD	1.35	1.69
	n	12	12

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Individual Coagulation Values - Termination
Appendix I - Main Study

Group	Animal Number	PT	APTT
		Seconds	Seconds
2M	2001	13.2	24.8
1200 ppm	2002	12.9	22.4
	2003	13.0	23.8
	2004	13.1	24.3
	2005	13.8	26.5
	2006	13.0	22.1
	2007	14.9	28.0
	2008	14.3	23.7
	2009	13.2	20.3
	2010	14.6	23.1
	2011	12.9	23.6
	2012	14.9	25.6
	Mean	13.7	24.0
	SD	0.81	2.06
	n	12	12

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Individual Coagulation Values - Termination
Appendix I - Main Study

Group	Animal Number	PT	APTT
		Seconds	Seconds
3M	3001	13.3	25.6
4000 ppm	3002	12.9	20.2
	3003	12.5	22.5
	3004	13.2	25.7
	3005	13.2	22.3
	3006	15.3	23.8
	3007	13.8	23.0
	3008	13.6	22.4
	3009	13.9	24.0
	3010	18.1	29.1
	3011	15.6	25.0
	3012	15.4	25.1
	Mean	14.2	24.1
	SD	1.59	2.27
	n	12	12

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Individual Coagulation Values - Termination
Appendix I - Main Study

Group	Animal Number	PT	APTT
		Seconds	Seconds
4M	4001	13.8	24.6
12000 ppm	4002	15.0	26.5
	4003	13.0	21.9
	4004	13.9	25.5
	4005	12.3	20.0
	4006	14.3	23.6
	4007	14.5	20.8
	4008	15.2	22.5
	4009	14.0	22.7
	4010	13.6	25.9
	4011	15.2	27.1
	4012	14.1	22.0
	Mean	14.1	23.6
	SD	0.87	2.31
	n	12	12

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Appendix I - Main Study

Group	Animal Number	PT	APTT
		Seconds	Seconds
1F	1501	11.9	20.2
0 ppm	1502	11.0	19.9
	1503	11.6	21.6
	1504	10.8	19.1
	1505	11.8	23.6
	1506	11.3	20.4
	1507	11.5	22.3
	1508	11.5	18.7
	1509	12.2	22.7
	1510	12.2	22.7
	1511	11.5	22.0
	1512	11.7	22.2
	Mean	11.6	21.3
	SD	0.42	1.57
	n	12	12

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Individual Coagulation Values - Termination
Appendix I - Main Study

Group	Animal Number	PT	APTT
		Seconds	Seconds
2F	2501	11.8	18.9
1200 ppm	2502	10.7	22.5
	2503	11.3	26.5
	2504	11.5	18.7
	2505	11.3	22.2
	2506	11.1	20.0
	2507	11.5	22.8
	2508	11.7	21.1
	2509	11.7	18.2
	2510	11.3	19.8
	2511	11.5	21.9
	2512	11.4	23.0
	Mean	11.4	21.3
	SD	0.30	2.35
	n	12	12

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Appendix I - Main Study

Group	Animal Number	PT	APTT
		Seconds	Seconds
3F	3501	11.9	23.4
4000 ppm	3502	11.8	20.9
	3503	11.6	22.5
	3504	12.3	24.1
	3505	11.8	22.4
	3506	11.9	22.3
	3507	12.1	25.9
	3508	11.7	21.7
	3509	11.1	21.3
	3510	12.6	20.7
	3511	11.9	25.3
	3512	11.7	22.2
	Mean	11.9	22.7
	SD	0.37	1.66
	n	12	12

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Appendix I - Main Study

Group	Animal Number	PT	APTT
		Seconds	Seconds
4F	4501	12.2	24.4
12000 ppm	4502	11.7	21.4
	4503	11.3	17.6
	4504	12.7	25.6
	4505	11.6	24.3
	4506	11.9	22.3
	4507	12.1	22.2
	4508	12.1	22.0
	4509	11.7	25.1
	4510	12.2	25.2
	4511	11.6	19.3
	4512	11.3	22.2
	Mean	11.9	22.6
	SD	0.41	2.45
	n	12	12

	Individual Clinical Chemistry Values Main Study Preface	Appendix J

Abbreviation	Parameter	Reporting Units
AST	Aspartate Aminotransferase	U/L
ALT	Alanine Aminotransferase	U/L
ALKP	Alkaline Phosphatase	U/L
BUN	Blood Urea Nitrogen	mg/dL
CREAT	Creatinine	mg/dL
GLU	Fasting Glucose	mg/dL
CHOL	Total Cholesterol (Enzymatic)	mg/dL
TRIG	Triglycerides	mg/dL
TP	Total Protein	g/dL
ALB	Albumin	g/dL
Glob	Globulin (calculated)	g/dL
A/G	Albumin/Globulin Ratio (calculated)	
TBILI	Total Bilirubin	mg/dL
Na^+	Sodium	mEq/L
K^+	Potassium	mEq/L
Cl^-	Chloride	mEq/L
Ca^{++}	Calcium	mg/dL
PHOS	Inorganic Phosphorus	mg/dL
GGT	Gamma-Glutamyl Transferase	U/L

Huntingdon Life Sciences Study No. 03-4245
Individual Clinical Chemistry Values - Termination
Appendix J - Main Study

Group	Animal Number	AST	ALT	ALKP	BUN	CREAT	GLU	CHOL	TRIG	TP
		U/L	U/L	U/L	mg/dL	mg/dL	mg/dL	mg/dL	mg/dL	g/dL
1M	1001	77	36	121	11.6	0.2	91	47	60	6.0
0 ppm	1002	70	41	200	11.3	0.3	95	61	78	6.1
	1003	93	46	206	10.3	0.3	100	69	74	6.9
	1004	72	35	158	11.6	0.3	95	57	45	6.9
	1005	78	42	184	11.1	0.3	92	54	63	6.6
	1006	78	35	139	10.7	0.3	83	54	61	6.9
	1007	73	33	153	10.9	0.3	191	37	48	6.4
	1008	93	44	169	13.0	0.4	84	43	67	6.8
	1009	95	46	170	12.1	0.3	102	46	40	6.1
	1010	81	34	181	9.8	0.3	102	59	81	6.7
	1011	83	43	160	10.1	0.3	107	42	61	6.4
	1012	73	42	158	12.1	0.3	91	41	35	5.8
	Mean	81	40	167	11.2	0.3	103	51	59	6.5
	SD	8.8	4.8	24.1	0.93	0.04	28.7	9.6	14.8	0.39
	n	12	12	12	12	12	12	12	12	12

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Individual Clinical Chemistry Values - Termination
Appendix J - Main Study

Group	Animal Number	ALB	Glob	A/G	TBILI	Na+	K+	Cl-	Ca++	PHOS
		g/dL	g/dL		mg/dL	mEq/L	mEq/L	mEq/L	mg/dL	mg/dL
1M	1001	4.0	2.0	2.0	0.11	148	6.0	104	10.3	8.3
0 ppm	1002	4.3	1.8	2.4	0.10	147	5.4	99	10.6	8.2
	1003	4.6	2.3	2.0	0.10	148	6.0	100	10.9	7.5
	1004	4.5	2.4	1.9	0.09	151	5.4	101	11.0	8.1
	1005	4.5	2.1	2.1	0.11	147	5.2	98	10.9	8.2
	1006	4.4	2.5	1.8	0.09	145	5.3	99	10.6	8.2
	1007	4.4	2.0	2.2	0.11	150	7.2	103	11.0	8.8
	1008	4.5	2.3	2.0	0.15	153	5.8	104	10.8	7.7
	1009	4.2	1.9	2.2	0.14	151	5.3	106	10.9	8.5
	1010	4.4	2.3	1.9	0.13	151	6.2	102	11.7	9.0
	1011	4.5	1.9	2.4	0.12	151	6.1	104	11.1	8.1
	1012	4.0	1.8	2.2	0.09	151	5.7	104	10.2	8.5
	Mean	4.4	2.1	2.1	0.11	149	5.8	102	10.8	8.3
	SD	0.20	0.24	0.19	0.020	2.4	0.56	2.6	0.39	0.42
	n	12	12	12	12	12	12	12	12	12

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Individual Clinical Chemistry Values - Termination
Appendix J - Main Study

Group	Animal Number	GGT
		U/L
1M	1001	0
0 ppm	1002	0
	1003	0
	1004	0
	1005	0
	1006	0
	1007	0
	1008	0
	1009	0
	1010	0
	1011	0
	1012	0
	Mean	0
	SD	0.0
	n	12

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Appendix J - Main Study

Group	Animal Number	AST	ALT	ALKP	BUN	CREAT	GLU	CHOL	TRIG	TP
		U/L	U/L	U/L	mg/dL	mg/dL	mg/dL	mg/dL	mg/dL	g/dL
2M	2001	66	39	149	13.0	0.2	96	51	60	6.6
1200 ppm	2002	69	30	119	9.0	0.2	91	43	70	6.1
	2003	77	39	200	11.2	0.3	90	54	47	6.3
	2004	77	43	214	12.7	0.3	115	56	70	7.0
	2005	77	45	153	12.1	0.3	100	50	58	6.4
	2006	70	41	220	12.0	0.3	110	59	57	6.3
	2007	83	35	122	11.5	0.3	100	50	44	6.6
	2008	96	43	211	13.7	0.4	106	48	39	6.6
	2009	96	39	210	9.3	0.4	94	64	72	6.9
	2010	88	39	276	16.4	0.4	100	29	19	6.5
	2011	80	42	133	11.9	0.3	115	73	71	6.6
	2012	83	38	141	11.1	0.3	95	56	32	6.2
	Mean	80	39	179	12.0	0.3	101	53	53	6.5
	SD	9.7	4.0	49.3	1.95	0.07	8.7	10.9	17.2	0.27
	n	12	12	12	12	12	12	12	12	12

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Individual Clinical Chemistry Values - Termination
Appendix J - Main Study

Group	Animal Number	ALB	Glob	A/G	TBILI	Na+	K+	Cl-	Ca++	PHOS
		g/dL	g/dL		mg/dL	mEq/L	mEq/L	mEq/L	mg/dL	mg/dL
2M	2001	4.4	2.2	2.0	0.12	148	5.9	101	10.7	8.5
1200 ppm	2002	4.3	1.8	2.4	0.09	147	5.4	100	10.3	8.1
	2003	4.4	1.9	2.3	0.10	149	5.4	102	10.8	7.4
	2004	4.3	2.7	1.6	0.10	148	6.1	101	11.0	8.6
	2005	4.4	2.0	2.2	0.10	150	5.2	102	10.6	7.2
	2006	4.4	1.9	2.3	0.13	150	5.6	104	10.7	8.6
	2007	4.4	2.2	2.0	0.14	147	5.5	100	9.9	7.2
	2008	4.2	2.4	1.8	0.12	148	6.3	101	11.1	10.6
	2009	4.7	2.2	2.1	0.13	153	6.1	105	11.6	8.7
	2010	4.4	2.1	2.1	0.13	151	5.6	106	10.3	8.6
	2011	4.5	2.1	2.1	0.15	150	6.1	102	10.7	7.3
	2012	4.1	2.1	2.0	0.10	148	5.8	102	10.7	7.9
	Mean	4.4	2.1	2.1	0.12	149	5.8	102	10.7	8.2
	SD	0.15	0.24	0.22	0.019	1.8	0.35	1.9	0.43	0.96
	n	12	12	12	12	12	12	12	12	12

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Appendix J - Main Study

Group	Animal Number	GGT
		U/L
2M	2001	0
1200 ppm	2002	0
	2003	0
	2004	0
	2005	0
	2006	0
	2007	0
	2008	0
	2009	0
	2010	0
	2011	0
	2012	0
	Mean	0
	SD	0.0
	n	12

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Appendix J - Main Study

Group	Animal Number	AST	ALT	ALKP	BUN	CREAT	GLU	CHOL	TRIG	TP
		U/L	U/L	U/L	mg/dL	mg/dL	mg/dL	mg/dL	mg/dL	g/dL
3M	3001	81	45	176	14.1	0.4	103	60	52	6.8
4000 ppm	3002	77	48	258	11.5	0.3	116	51	70	6.8
	3003	84	41	176	8.9	0.3	103	70	49	6.3
	3004	73	37	234	11.5	0.3	112	57	65	6.5
	3005	67	38	138	13.6	0.3	112	48	45	6.2
	3006	74	40	142	8.6	0.2	106	39	46	6.6
	3007	68	37	154	11.7	0.2	88	59	39	6.7
	3008	106	51	217	10.9	0.3	90	51	60	6.6
	3009	75	35	180	9.6	0.3	102	55	41	6.4
	3010	87	46	137	11.6	0.3	95	47	45	6.6
	3011	79	37	188	10.8	0.3	100	47	32	6.5
	3012	77	32	167	8.8	0.3	99	68	47	6.6
	Mean	79	41	181	11.0	0.3	102	54	49	6.6
	SD	10.3	5.7	38.6	1.78	0.05	8.6	9.0	11.0	0.18
	n	12	12	12	12	12	12	12	12	12

Huntingdon Life Sciences Study No. 03-4245
Individual Clinical Chemistry Values - Termination
Appendix J - Main Study

Group	Animal Number	ALB	Glob	A/G	TBILI	Na+	K+	Cl-	Ca++	PHOS
		g/dL	g/dL		mg/dL	mEq/L	mEq/L	mEq/L	mg/dL	mg/dL
3M	3001	4.4	2.4	1.8	0.12	147	5.7	99	11.2	8.2
4000 ppm	3002	4.5	2.3	2.0	0.11	149	6.4	101	10.9	8.8
	3003	4.3	2.0	2.2	0.12	146	5.3	101	10.2	7.5
	3004	4.4	2.1	2.1	0.12	146	5.6	98	11.0	8.5
	3005	4.2	2.0	2.1	0.11	149	5.1	102	10.4	7.6
	3006	4.4	2.2	2.0	0.09	147	4.8	100	10.6	8.6
	3007	4.5	2.2	2.0	0.10	152	5.6	103	10.9	7.6
	3008	4.5	2.1	2.1	0.13	147	6.0	101	11.2	8.1
	3009	4.2	2.2	1.9	0.11	143	5.1	97	10.2	7.1
	3010	4.4	2.2	2.0	0.10	153	5.6	104	11.3	8.8
	3011	4.4	2.1	2.1	0.11	149	5.8	103	10.5	7.5
	3012	4.2	2.4	1.8	0.11	153	6.2	104	11.0	9.0
	Mean	4.4	2.2	2.0	0.11	148	5.6	101	10.8	8.1
	SD	0.12	0.13	0.12	0.011	3.1	0.47	2.3	0.39	0.63
	n	12	12	12	12	12	12	12	12	12

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Appendix J - Main Study

Group	Animal Number	GGT
		U/L
3M	3001	0
4000 ppm	3002	0
	3003	0
	3004	0
	3005	0
	3006	0
	3007	0
	3008	0
	3009	0
	3010	0
	3011	0
	3012	0
	Mean	0
	SD	0.0
	n	12

Huntingdon Life Sciences Study No. 03-4245
Individual Clinical Chemistry Values - Termination
Appendix J - Main Study

Group	Animal Number	AST	ALT	ALKP	BUN	CREAT	GLU	CHOL	TRIG	TP
		U/L	U/L	U/L	mg/dL	mg/dL	mg/dL	mg/dL	mg/dL	g/dL
4M	4001	91	46	135	10.6	0.3	93	49	42	7.0
12000 ppm	4002	79	43	196	11.6	0.3	92	60	62	6.8
	4003	75	35	160	14.2	0.3	105	48	27	6.2
	4004	79	38	135	14.7	0.3	81	35	52	6.2
	4005	86	44	173	10.6	0.3	158	51	66	6.3
	4006	80	39	169	12.3	0.3	104	62	76	6.7
	4007	101	38	130	10.5	0.3	108	50	27	6.3
	4008	90	42	182	10.5	0.3	96	47	49	6.6
	4009	91	35	237	11.1	0.3	100	43	46	6.4
	4010	86	39	175	10.5	0.4	113	55	33	7.0
	4011	70	28	111	10.4	0.2	97	51	37	5.8
	4012	96	45	166	9.0	0.3	100	59	49	6.9
	Mean	85	39	164	11.3	0.3	104	51	47	6.5
	SD	9.0	5.1	33.8	1.65	0.04	19.0	7.6	15.3	0.38
	n	12	12	12	12	12	12	12	12	12

Huntingdon Life Sciences Study No. 03-4245
Individual Clinical Chemistry Values - Termination
Appendix J - Main Study

Group	Animal Number	ALB	Glob	A/G	TBILI	Na+	K+	Cl-	Ca++	PHOS
		g/dL	g/dL		mg/dL	mEq/L	mEq/L	mEq/L	mg/dL	mg/dL
4M	4001	4.1	2.9	1.4	0.12	145	5.8	99	10.6	7.8
12000 ppm	4002	4.5	2.3	2.0	0.11	149	5.2	102	11.1	8.1
	4003	4.3	1.9	2.3	0.09	146	5.4	103	10.3	8.1
	4004	4.2	2.0	2.1	0.11	147	6.0	103	10.4	8.9
	4005	4.3	2.0	2.2	0.11	147	5.1	102	11.1	9.0
	4006	4.5	2.2	2.0	0.09	146	5.5	99	11.1	9.0
	4007	4.5	1.8	2.5	0.08	152	6.0	106	10.5	8.9
	4008	4.4	2.2	2.0	0.10	151	6.4	105	11.0	9.0
	4009	4.4	2.0	2.2	0.11	152	5.7	104	11.0	8.5
	4010	4.7	2.3	2.0	0.13	151	6.3	103	11.7	9.2
	4011	4.0	1.8	2.2	0.08	149	5.4	102	10.7	8.5
	4012	4.6	2.3	2.0	0.11	149	6.0	103	10.7	8.9
	Mean	4.4	2.1	2.1	0.10	149	5.7	103	10.9	8.7
	SD	0.21	0.30	0.26	0.016	2.5	0.42	2.1	0.39	0.45
	n	12	12	12	12	12	12	12	12	12

Huntingdon Life Sciences Study No. 03-4245
Individual Clinical Chemistry Values - Termination
Appendix J - Main Study

Group	Animal Number	GGT
		U/L
4M	4001	0
12000 ppm	4002	0
	4003	0
	4004	0
	4005	0
	4006	0
	4007	0
	4008	0
	4009	0
	4010	0
	4011	0
	4012	0
	Mean	0
	SD	0.0
	n	12

Huntingdon Life Sciences Study No. 03-4245
Individual Clinical Chemistry Values - Termination
Appendix J - Main Study

Group	Animal Number	AST	ALT	ALKP	BUN	CREAT	GLU	CHOL	TRIG	TP
		U/L	U/L	U/L	mg/dL	mg/dL	mg/dL	mg/dL	mg/dL	g/dL
1F	1501	93	33	73	15.5	0.4	94	76	35	6.8
0 ppm	1502	71	34	101	14.7	0.3	107	62	26	7.5
	1503	67	33	70	14.3	0.4	114	83	55	7.4
	1504	104	32	84	15.0	0.4	109	63	36	7.2
	1505	86	37	95	14.1	0.3	96	59	28	7.0
	1506	76	34	70	12.9	0.3	103	60	27	7.5
	1507	83	36	75	14.0	0.4	99	65	40	7.7
	1508	81	36	113	11.3	0.3	95	100	66	6.8
	1509	70	33	129	13.3	0.3	102	50	40	6.3
	1510	76	36	87	13.9	0.4	94	62	39	7.0
	1511	88	35	57	10.5	0.4	108	75	42	7.6
	1512	80	23	80	14.4	0.4	109	48	31	7.1
	Mean	81	34	86	13.7	0.4	103	67	39	7.2
	SD	10.5	3.7	20.4	1.47	0.05	6.9	14.5	11.7	0.41
	n	12	12	12	12	12	12	12	12	12

Huntingdon Life Sciences Study No. 03-4245
Individual Clinical Chemistry Values - Termination
Appendix J - Main Study

Group	Animal Number	ALB	Glob	A/G	TBILI	Na+	K+	Cl-	Ca++	PHOS
		g/dL	g/dL		mg/dL	mEq/L	mEq/L	mEq/L	mg/dL	mg/dL
1F	1501	4.7	2.1	2.2	0.09	148	6.1	104	10.5	7.1
0 ppm	1502	5.2	2.3	2.3	0.18	148	5.7	103	11.4	8.3
	1503	5.2	2.2	2.4	0.15	147	5.9	103	11.3	7.4
	1504	4.8	2.4	2.0	0.11	143	6.8	104	11.4	9.2
	1505	4.7	2.3	2.0	0.15	145	5.8	102	11.2	8.2
	1506	5.3	2.2	2.4	0.13	145	5.4	104	11.2	8.1
	1507	5.1	2.6	2.0	0.14	147	5.8	101	11.9	7.6
	1508	4.8	2.0	2.4	0.19	148	5.3	103	10.9	7.3
	1509	4.6	1.7	2.7	0.16	146	6.0	106	10.7	8.3
	1510	5.0	2.0	2.5	0.15	148	5.3	104	11.0	7.0
	1511	5.1	2.5	2.0	0.13	148	5.4	104	11.1	6.9
	1512	4.7	2.4	2.0	0.11	146	5.3	103	11.2	6.6
	Mean	4.9	2.2	2.2	0.14	147	5.7	103	11.2	7.7
	SD	0.24	0.25	0.24	0.029	1.6	0.44	1.2	0.36	0.76
	n	12	12	12	12	12	12	12	12	12

Huntingdon Life Sciences Study No. 03-4245
Individual Clinical Chemistry Values - Termination
Appendix J - Main Study

Group	Animal Number	GGT
		U/L
1F	1501	0
0 ppm	1502	0
	1503	0
	1504	0
	1505	0
	1506	0
	1507	0
	1508	0
	1509	0
	1510	0
	1511	0
	1512	0
	Mean	0
	SD	0.0
	n	12

Huntingdon Life Sciences Study No. 03-4245
Individual Clinical Chemistry Values - Termination
Appendix J - Main Study

Group	Animal Number	AST	ALT	ALKP	BUN	CREAT	GLU	CHOL	TRIG	TP
		U/L	U/L	U/L	mg/dL	mg/dL	mg/dL	mg/dL	mg/dL	g/dL
2F	2501	88	28	85	16.5	0.4	93	51	25	7.2
1200 ppm	2502	82	36	83	14.9	0.4	93	78	51	7.8
	2503	74	32	73	11.9	0.4	93	66	38	7.6
	2504	89	39	109	14.0	0.5	96	52	38	7.2
	2505	70	30	125	12.7	0.3	103	82	32	7.4
	2506	74	34	102	15.4	0.3	110	62	38	7.0
	2507	89	31	107	13.5	0.5	92	79	39	7.5
	2508	89	38	107	16.7	0.4	101	89	56	7.0
	2509	90	42	83	15.2	0.4	100	63	40	6.5
	2510	83	33	73	15.2	0.5	100	68	40	7.7
	2511	82	40	81	14.4	0.4	103	63	36	7.0
	2512	81	30	92	13.9	0.4	98	63	37	6.9
	Mean	83	34	93	14.5	0.4	99	68	39	7.2
	SD	6.9	4.5	16.4	1.43	0.07	5.4	11.7	8.0	0.38
	n	12	12	12	12	12	12	12	12	12

Huntingdon Life Sciences Study No. 03-4245
Individual Clinical Chemistry Values - Termination
Appendix J - Main Study

Group	Animal Number	ALB	Glob	A/G	TBILI	Na+	K+	Cl-	Ca++	PHOS
		g/dL	g/dL		mg/dL	mEq/L	mEq/L	mEq/L	mg/dL	mg/dL
2F	2501	5.0	2.2	2.3	0.14	149	5.7	103	11.0	8.6
1200 ppm	2502	5.3	2.5	2.1	0.15	146	6.2	100	11.4	8.4
	2503	5.4	2.2	2.5	0.13	147	6.1	102	11.3	7.5
	2504	5.0	2.2	2.3	0.13	146	6.4	100	11.1	8.7
	2505	5.1	2.3	2.2	0.20	145	5.5	99	11.6	8.1
	2506	5.3	1.7	3.1	0.17	146	5.8	99	11.3	8.9
	2507	5.0	2.5	2.0	0.18	148	5.5	103	11.1	6.8
	2508	5.0	2.0	2.5	0.16	149	6.1	104	11.3	7.8
	2509	4.4	2.1	2.1	0.18	145	5.7	100	10.9	8.2
	2510	5.6	2.1	2.7	0.20	145	6.6	100	11.5	8.1
	2511	4.7	2.3	2.0	0.15	146	5.1	102	10.8	7.1
	2512	4.7	2.2	2.1	0.14	147	5.8	103	10.8	7.1
	Mean	5.0	2.2	2.3	0.16	147	5.9	101	11.2	7.9
	SD	0.33	0.22	0.33	0.025	1.4	0.42	1.8	0.27	0.69
	n	12	12	12	12	12	12	12	12	12

Huntingdon Life Sciences Study No. 03-4245
Individual Clinical Chemistry Values - Termination
Appendix J - Main Study

Group	Animal Number	GGT
		U/L
2F	2501	0
1200 ppm	2502	0
	2503	0
	2504	0
	2505	0
	2506	0
	2507	0
	2508	0
	2509	0
	2510	0
	2511	0
	2512	0
	Mean	0
	SD	0.0
	n	12

Huntingdon Life Sciences Study No. 03-4245
Individual Clinical Chemistry Values - Termination
Appendix J - Main Study

Group	Animal Number	AST	ALT	ALKP	BUN	CREAT	GLU	CHOL	TRIG	TP
		U/L	U/L	U/L	mg/dL	mg/dL	mg/dL	mg/dL	mg/dL	g/dL
3F	3501	76	37	72	13.2	0.4	87	64	27	7.5
4000 ppm	3502	99	46	81	13.3	0.4	106	48	30	7.1
	3503	70	37	80	13.7	0.3	88	75	57	6.8
	3504	75	43	73	12.6	0.3	105	76	35	7.1
	3505	79	30	95	13.5	0.4	93	79	42	7.4
	3506	81	36	64	13.6	0.4	96	59	34	7.7
	3507	73	33	119	13.8	0.3	99	65	41	6.9
	3508	82	43	106	13.5	0.4	111	105	134	7.6
	3509	64	25	77	14.0	0.4	123	88	75	7.0
	3510	88	35	88	10.7	0.3	96	58	37	7.2
	3511	80	31	110	15.1	0.4	92	72	46	7.2
	3512	70	31	104	11.9	0.4	103	89	41	7.9
	Mean	78	36	89	13.2	0.4	100	73	50	7.3
	SD	9.2	6.1	17.5	1.11	0.05	10.4	15.8	29.5	0.34
	n	12	12	12	12	12	12	12	12	12

Huntingdon Life Sciences Study No. 03-4245
Individual Clinical Chemistry Values - Termination
Appendix J - Main Study

Group	Animal Number	ALB	Glob	A/G	TBILI	Na+	K+	Cl-	Ca++	PHOS
		g/dL	g/dL		mg/dL	mEq/L	mEq/L	mEq/L	mg/dL	mg/dL
3F	3501	5.1	2.4	2.1	0.18	147	6.3	104	11.3	8.8
4000 ppm	3502	4.9	2.2	2.2	0.15	148	6.4	106	11.2	8.9
	3503	4.8	2.0	2.4	0.12	148	6.0	103	11.0	7.6
	3504	4.8	2.3	2.1	0.16	146	5.2	99	11.1	7.4
	3505	5.0	2.4	2.1	0.16	147	5.2	102	10.9	8.4
	3506	5.1	2.6	2.0	0.15	149	5.3	102	11.0	8.1
	3507	4.7	2.2	2.1	0.17	148	5.7	102	11.0	7.3
	3508	5.2	2.4	2.2	0.17	147	5.2	102	11.2	6.9
	3509	4.6	2.4	1.9	0.11	143	5.2	100	10.8	5.9
	3510	4.8	2.4	2.0	0.16	149	5.6	105	10.9	7.1
	3511	4.6	2.6	1.8	0.13	148	5.6	102	11.2	6.9
	3512	5.3	2.6	2.0	0.16	148	5.3	103	11.3	7.4
	Mean	4.9	2.4	2.1	0.15	147	5.6	103	11.1	7.6
	SD	0.23	0.18	0.15	0.021	1.6	0.44	1.9	0.17	0.87
	n	12	12	12	12	12	12	12	12	12

Huntingdon Life Sciences Study No. 03-4245
Individual Clinical Chemistry Values - Termination
Appendix J - Main Study

Group	Animal Number	GGT
		U/L
3F	3501	0
4000 ppm	3502	0
	3503	0
	3504	0
	3505	0
	3506	0
	3507	0
	3508	0
	3509	0
	3510	0
	3511	0
	3512	0
	Mean	0
	SD	0.0
	n	12

Huntingdon Life Sciences Study No. 03-4245
Individual Clinical Chemistry Values - Termination
Appendix J - Main Study

Group	Animal Number	AST	ALT	ALKP	BUN	CREAT	GLU	CHOL	TRIG	TP
		U/L	U/L	U/L	mg/dL	mg/dL	mg/dL	mg/dL	mg/dL	g/dL
4F	4501	84	33	78	17.5	0.4	103	62	39	7.1
12000 ppm	4502	82	36	68	12.5	0.3	92	60	31	7.6
	4503	77	34	72	15.8	0.4	119	71	53	7.6
	4504	77	29	73	11.3	0.3	93	64	48	6.5
	4505	71	37	107	13.4	0.3	111	70	47	7.4
	4506	84	34	98	11.4	0.3	101	62	31	7.3
	4507	74	29	71	15.0	0.4	101	89	54	7.5
	4508	83	41	122	15.5	0.4	113	90	51	7.5
	4509	77	31	91	13.6	0.5	99	77	33	7.2
	4510	73	35	80	12.8	0.3	105	62	42	7.4
	4511	84	30	93	12.2	0.4	100	61	31	6.9
	4512	76	42	103	14.5	0.4	105	74	50	7.2
	Mean	79	34	88	13.8	0.4	104	70	43	7.3
	SD	4.7	4.3	17.1	1.91	0.07	7.9	10.6	9.2	0.32
	n	12	12	12	12	12	12	12	12	12

Huntingdon Life Sciences Study No. 03-4245
Individual Clinical Chemistry Values - Termination
Appendix J - Main Study

Group	Animal Number	ALB	Glob	A/G	TBILI	Na+	K+	Cl-	Ca++	PHOS
		g/dL	g/dL		mg/dL	mEq/L	mEq/L	mEq/L	mg/dL	mg/dL
4F	4501	5.0	2.1	2.4	0.14	149	5.6	104	11.2	8.2
12000 ppm	4502	5.2	2.4	2.2	0.15	147	6.0	102	11.2	7.4
	4503	4.9	2.7	1.8	0.16	146	5.3	103	12.3	11.0
	4504	4.7	1.8	2.6	0.23	148	5.7	103	10.9	7.1
	4505	5.2	2.2	2.4	0.17	148	5.8	102	11.7	9.1
	4506	5.1	2.2	2.3	0.16	148	5.6	103	11.3	8.1
	4507	4.9	2.6	1.9	0.16	150	5.9	103	11.6	7.6
	4508	5.1	2.4	2.1	0.17	150	5.0	104	11.4	6.6
	4509	4.9	2.3	2.1	0.11	148	4.9	102	11.4	7.1
	4510	5.1	2.3	2.2	0.14	147	5.8	102	11.1	7.5
	4511	4.5	2.4	1.9	0.11	150	6.3	105	11.2	8.4
	4512	5.0	2.2	2.3	0.14	148	5.2	103	11.3	7.4
	Mean	5.0	2.3	2.2	0.15	148	5.6	103	11.4	8.0
	SD	0.21	0.23	0.24	0.031	1.3	0.42	1.0	0.36	1.17
	n	12	12	12	12	12	12	12	12	12

Huntingdon Life Sciences Study No. 03-4245
Individual Clinical Chemistry Values - Termination
Appendix J - Main Study

Group	Animal Number	GGT
		U/L
4F	4501	0
12000 ppm	4502	0
	4503	0
	4504	0
	4505	0
	4506	0
	4507	0
	4508	0
	4509	0
	4510	0
	4511	0
	4512	0
	Mean	0
	SD	0.0
	n	12

	Individual Organ Weights Main Study Preface	Appendix K

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Key to Abbreviations:

g	=	Grams
observ.	=	Observed
wt.	=	Weight

Corresponding exposure levels for each group were as follows:

Group 1 - 0 ppm
Group 2 - 1200 ppm
Group 3 - 4000 ppm
Group 4 - 12000 ppm

Note:

Ovaries w/Oviduct were weighed together.

Huntingdon Life Sciences
Princeton Research Center
East Millstone, New Jersey
Appendix K - Main Study

Summary statistics for absolute organ weights (g)
Study number: 034245

Printed: 21-May-04
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Animal No/sex	Group/ Subgroup	Terminal Body wt. (g)	Adrenal Glands	Brain	Epididymis Left	Epididymis Right	Heart	Kidneys
				Male Animals				
1001/M	1/1	379.4	0.0725	2.1417	0.6080	0.6231	1.6007	3.4783
1002/M	1/1	366.5	0.0633	2.1870	0.5395	0.5832	1.5048	3.2643
1003/M	1/1	391.2	0.0563	2.3190	0.5712	0.5900	1.5259	3.7668
1004/M	1/1	371.0	0.0865	2.2168	0.5731	0.6264	1.5324	3.7914
1005/M	1/1	363.1	0.1061	2.1403	0.6823	0.6904	1.2976	3.6469
1006/M	1/1	393.0	0.0576	2.2538	0.5743	0.5694	1.2395	3.8284
1007/M	1/1	374.9	0.0895	2.2899	0.6411	0.6738	1.4642	3.8728
1008/M	1/1	395.1	0.0616	2.3841	0.7065	0.7004	1.6865	3.6773
1009/M	1/1	332.2	0.0599	2.3312	0.5926	0.5908	1.4037	3.4202
1010/M	1/1	431.7	0.0709	2.4120	0.7390	0.7344	1.6800	3.8676
1011/M	1/1	399.1	0.0706	2.1630	0.5755	0.6371	1.9171	3.9899
1012/M	1/1	332.8	0.0581	2.1570	0.5602	0.5936	1.2736	3.1513
Mean:		377.5	0.0711	2.2497	0.6136	0.6344	1.5105	3.6463
Standard deviation:		27.9	0.0155	0.0964	0.0640	0.0536	0.1959	0.2626
Number of observ. :		(12)	(12)	(12)	(12)	(12)	(12)	(12)
2001/M	2/1	346.4	0.0708	2.2842	0.7389	0.6205	1.2688	3.0112
2002/M	2/1	398.0	0.0506	2.0751	0.5086	0.5480	1.2822	3.2938
2003/M	2/1	333.6	0.0641	1.9899	0.5650	0.5594	1.1078	2.7132
2004/M	2/1	414.3	0.0734	2.1423	0.6636	0.6467	1.5007	3.3519
2005/M	2/1	367.0	0.0790	2.1446	0.5439	0.6580	1.3095	3.1027
2006/M	2/1	394.8	0.0680	2.0101	0.6950	0.7818	1.5439	3.5656
2007/M	2/1	391.5	0.0867	2.3294	0.7275	0.7372	1.7129	3.7361
2008/M	2/1	376.4	0.0274	2.2300	0.6239	0.5387	1.2831	3.3426
2009/M	2/1	392.1	0.0620	2.2865	0.5623	0.5325	1.8240	3.1871
2010/M	2/1	327.7	0.0572	2.3268	0.6476	0.5717	1.2932	3.3105
2011/M	2/1	334.5	0.0734	2.1155	0.5577	0.5425	1.1342	3.1890
2012/M	2/1	366.7	0.0761	2.4265	0.5603	0.6476	1.6710	3.1772
Mean:		370.3	0.0657	2.1967	0.6162	0.6154	1.4109	3.2484
Standard deviation:		29.1	0.0155	0.1378	0.0774	0.0820	0.2337	0.2594
Number of observ. :		(12)	(12)	(12)	(12)	(12)	(12)	(12)
3001/M	3/1	414.0	0.0658	2.2557	0.5340	0.6286	1.3843	3.6048
3002/M	3/1	373.2	0.0755	2.0047	0.7273	0.6690	1.2277	2.9824
3003/M	3/1	389.8	0.0676	2.1546	0.6083	0.6039	1.2897	3.4307
3004/M	3/1	454.3	0.0865	2.1104	0.7100	0.7323	1.5581	3.9125
3005/M	3/1	419.1	0.0801	2.2161	0.6497	0.6089	1.2981	3.3911
3006/M	3/1	371.1	0.0751	2.1784	0.6233	0.6469	1.5385	3.7509
3007/M	3/1	362.8	0.0638	2.2351	0.6689	0.5906	1.7300	3.9860
3008/M	3/1	371.4	0.0640	2.5154	0.6670	0.6207	1.5409	3.2770
3009/M	3/1	427.3	0.0714	2.1646	0.5723	0.5890	1.6085	4.1806
3010/M	3/1	352.3	0.0732	2.3023	0.6948	0.6712	1.3727	3.4519
3011/M	3/1	358.2	0.0659	2.3111	0.5976	0.6077	1.5367	3.5147
3012/M	3/1	349.5	0.0545	2.2112	0.6891	0.5826	1.3169	3.3856
Mean:		386.9	0.0703	2.2216	0.6452	0.6293	1.4502	3.5724

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Animal No/sex	Group/ Subgroup	Terminal Body wt. (g)	Adrenal Glands	Brain	Epididymis Left	Epididymis Right	Heart	Kidneys
Standard deviation:		33.9	0.0085	0.1248	0.0589	0.0439	0.1552	0.3345
Number of observ. :		(12)	(12)	(12)	(12)	(12)	(12)	(12)
4001/M	4/1	346.5	0.0642	2.1870	0.6898	0.5828	1.3070	3.3569
4002/M	4/1	356.0	0.0637	2.1670	0.7062	0.7404	1.2002	3.1635
4003/M	4/1	360.2	0.0631	2.0316	0.5814	0.6083	1.1643	3.1004
4004/M	4/1	318.7	0.0499	2.1817	0.5569	0.6190	1.1588	3.0114
4005/M	4/1	384.7	0.0674	2.3401	0.6902	0.6672	1.3817	3.4320
4006/M	4/1	346.5	0.0749	1.9640	0.6337	0.6547	1.2437	3.3642
4007/M	4/1	355.4	0.0638	2.1752	0.6144	0.6352	1.4001	3.5241
4008/M	4/1	374.4	0.0732	2.4027	0.6334	0.6503	1.9267	3.6027
4009/M	4/1	344.5	0.0536	2.4075	0.5950	0.7269	1.7430	3.0948
4010/M	4/1	372.2	0.0727	2.3809	0.5822	0.5536	1.4921	3.6549
4011/M	4/1	309.1	0.0605	2.2181	0.6489	0.6327	1.4040	3.1055
4012/M	4/1	357.7	0.0516	2.1955	0.4732	0.4912	1.1614	3.1179
M e a n:		352.2	0.0632	2.2209	0.6171	0.6302	1.3819	3.2940
Standard deviation:		21.7	0.0083	0.1407	0.0657	0.0687	0.2419	0.2230
Number of observ. :		(12)	(12)	(12)	(12)	(12)	(12)	(12)

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Animal No/sex	Group/ Subgroup	Terminal Body wt. (g)	Liver	Lungs	Spleen	Testis Left	Testis Right	Thymus
				Male Animals				
1001/M	1/1	379.4	11.4095	1.9597	0.8551	1.6126	1.6177	0.5934
1002/M	1/1	366.5	11.7506	1.9464	0.7459	1.5973	1.5986	0.6796
1003/M	1/1	391.2	14.2114	3.9668	0.6012	1.4612	1.5007	0.4304
1004/M	1/1	371.0	12.7828	2.0896	0.7298	1.7312	1.6592	0.5156
1005/M	1/1	363.1	13.0213	1.8022	0.7571	1.6868	1.7060	0.6202
1006/M	1/1	393.0	13.1167	1.7602	0.9586	1.6945	1.5941	0.5710
1007/M	1/1	374.9	13.5964	2.3361	0.7169	1.6499	1.6404	0.7122
1008/M	1/1	395.1	11.5354	2.1993	0.7784	1.8339	1.7947	0.5103
1009/M	1/1	332.2	9.7470	2.0447	0.6310	1.4485	1.4445	0.6379
1010/M	1/1	431.7	15.4506	2.2311	0.9972	2.0640	2.0341	0.5178
1011/M	1/1	399.1	12.6753	2.3427	1.0197	1.8618	1.8189	0.4874
1012/M	1/1	332.8	10.0623	2.0519	0.6839	1.4635	1.5021	0.3780
Mean:		377.5	12.4466	2.2276	0.7896	1.6754	1.6593	0.5545
Standard deviation:		27.9	1.6451	0.5787	0.1390	0.1828	0.1631	0.0997
Number of observ. :		(12)	(12)	(12)	(12)	(12)	(12)	(12)
2001/M	2/1	346.4	11.7111	1.9781	0.7801	1.8363	1.8028	0.7042
2002/M	2/1	398.0	13.3385	1.6707	0.7212	1.5050	1.5387	0.5033
2003/M	2/1	333.6	10.1418	1.3975	0.5228	1.5700	1.5732	0.5008
2004/M	2/1	414.3	14.2171	2.2341	0.6924	1.4535	1.5162	0.6558
2005/M	2/1	367.0	11.6522	1.9204	0.6491	1.5423	1.5367	0.4312
2006/M	2/1	394.8	13.3882	2.2069	0.7012	2.0116	2.0176	0.4806
2007/M	2/1	391.5	11.7677	2.5236	0.9277	1.8626	1.8455	0.4675
2008/M	2/1	376.4	12.3103	2.1283	0.7955	1.7564	1.7549	0.4873
2009/M	2/1	392.1	11.3758	2.2997	0.7352	1.6156	1.6059	0.5296
2010/M	2/1	327.7	13.1998	1.8944	0.5528	1.5047	1.5135	0.3658
2011/M	2/1	334.5	11.0064	1.7164	0.6488	1.4769	1.4285	0.4362
2012/M	2/1	366.7	10.5250	1.7771	0.6869	1.5866	1.5615	0.3887
Mean:		370.3	12.0528	1.9789	0.7011	1.6435	1.6413	0.4959
Standard deviation:		29.1	1.2577	0.3151	0.1077	0.1797	0.1741	0.0988
Number of observ. :		(12)	(12)	(12)	(12)	(12)	(12)	(12)
3001/M	3/1	414.0	14.3348	2.3949	0.7872	1.5495	1.4985	0.6854
3002/M	3/1	373.2	12.6397	1.9090	0.7957	1.5736	1.5372	0.4584
3003/M	3/1	389.8	11.9943	1.8109	0.9791	1.6622	1.6087	0.5042
3004/M	3/1	454.3	15.0379	2.1291	0.8903	1.7261	1.7404	0.7071
3005/M	3/1	419.1	13.1366	1.7699	0.7047	1.8317	1.8425	0.5306
3006/M	3/1	371.1	11.8786	2.0864	0.6367	1.6924	1.6562	0.5409
3007/M	3/1	362.8	11.8835	2.1504	0.9012	1.7116	1.6940	0.4280
3008/M	3/1	371.4	13.7355	2.2979	0.8347	1.9323	1.8749	0.4957
3009/M	3/1	427.3	13.4380	2.2428	0.9860	1.6226	1.5130	0.5196
3010/M	3/1	352.3	12.5023	1.9421	0.7225	1.5676	1.5910	0.4816
3011/M	3/1	358.2	11.4588	1.8854	0.5929	1.6206	1.5641	0.4099
3012/M	3/1	349.5	12.6074	2.0797	0.5833	1.6205	1.5041	0.3545
Mean:		386.9	12.8873	2.0582	0.7845	1.6759	1.6354	0.5097

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Animal No/sex	Group/ Subgroup	Terminal Body wt. (g)	Liver	Lungs	Spleen	Testis Left	Testis Right	Thymus
Standard deviation:		33.9	1.0853	0.1976	0.1399	0.1134	0.1292	0.1026
Number of observ. :		(12)	(12)	(12)	(12)	(12)	(12)	(12)
4001/M	4/1	346.5	11.0211	1.7990	0.7379	1.4527	1.4824	0.4460
4002/M	4/1	356.0	10.5430	1.8909	0.7423	1.7081	1.7363	0.6846
4003/M	4/1	360.2	11.0767	1.5116	0.7563	1.5376	1.5083	0.5834
4004/M	4/1	318.7	10.0110	1.5867	0.7169	1.5010	1.5057	0.5233
4005/M	4/1	384.7	13.1856	2.3694	0.6767	1.8327	1.8722	0.5338
4006/M	4/1	346.5	10.7492	1.4960	0.5907	1.3963	1.5263	0.5235
4007/M	4/1	355.4	12.4963	2.0024	0.7742	1.6635	1.5909	0.5334
4008/M	4/1	374.4	12.1829	1.9887	0.9517	1.8513	1.8460	0.5336
4009/M	4/1	344.5	11.4342	2.2395	0.7775	1.9822	1.9048	0.3654
4010/M	4/1	372.2	11.4116	2.1795	0.7639	1.7228	1.7452	0.4523
4011/M	4/1	309.1	9.3993	1.6804	0.5759	1.4911	1.5479	0.2639
4012/M	4/1	357.7	9.8021	1.4469	0.5092	1.3396	1.3612	0.5021
M e a n:		352.2	11.1094	1.8493	0.7144	1.6232	1.6356	0.4954
Standard deviation:		21.7	1.1234	0.3129	0.1158	0.2010	0.1780	0.1063
Number of observ. :		(12)	(12)	(12)	(12)	(12)	(12)	(12)

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Animal No/sex	Group/ Subgroup	Terminal Body wt. (g)	Adrenal Glands	Brain	Heart	Kidneys	Liver	Lungs
				F e m a l e	A n i m a l s			
1501/F	1/1	212.7	0.0528	2.0376	0.8144	2.0528	7.9699	1.6279
1502/F	1/1	239.9	0.0855	1.8796	0.9379	2.2730	8.2896	1.6620
1503/F	1/1	248.0	0.0659	1.7893	0.9063	1.7904	8.0763	1.3342
1504/F	1/1	232.5	0.0598	1.8385	0.8443	1.9765	8.2595	1.1979
1505/F	1/1	239.8	0.0672	2.0113	0.9189	1.8902	7.1710	1.4316
1506/F	1/1	221.3	0.0722	1.9402	0.8234	2.0474	9.3936	1.4703
1507/F	1/1	224.3	0.0804	1.8477	0.9166	2.0723	8.1838	1.5016
1508/F	1/1	219.0	0.0655	2.0585	0.9038	2.3762	7.7684	1.6426
1509/F	1/1	233.4	0.0809	1.8859	1.0969	2.1404	7.2549	1.5747
1510/F	1/1	239.0	0.0733	2.0749	1.0198	2.5319	8.1043	2.0886
1511/F	1/1	242.2	0.0801	2.1740	0.9934	1.9292	8.2623	1.8048
1512/F	1/1	277.2	0.0804	2.1099	1.0753	2.3183	10.5938	1.3884
M e a n:		235.8	0.0720	1.9706	0.9376	2.1166	8.2773	1.5604
Standard deviation:		16.8	0.0100	0.1233	0.0925	0.2193	0.9202	0.2337
Number of observ. :		(12)	(12)	(12)	(12)	(12)	(12)	(12)
2501/F	2/1	206.2	0.0686	1.7976	0.8346	1.7185	6.0844	1.2334
2502/F	2/1	257.4	0.0806	2.0987	0.9258	2.1666	10.2229	2.0967
2503/F	2/1	232.9	0.0718	1.9985	0.8788	2.2440	8.8562	1.9872
2504/F	2/1	237.4	0.0529	1.7432	1.2435	1.7744	7.3210	2.3718
2505/F	2/1	228.0	0.0708	1.9316	0.8960	2.1366	8.4177	1.2842
2506/F	2/1	233.0	0.0591	1.9540	0.8346	1.8579	7.2816	1.1427
2507/F	2/1	248.5	0.1057	2.1791	0.9424	2.4677	8.4785	1.6572
2508/F	2/1	228.9	0.0842	2.0580	1.0116	2.2597	7.8240	1.7812
2509/F	2/1	250.4	0.0652	2.2596	0.9270	2.3553	8.6486	1.4685
2510/F	2/1	220.7	0.0746	2.1486	0.8811	1.8276	7.7048	1.4398
2511/F	2/1	245.7	0.0742	2.1805	1.0553	2.4238	8.8298	1.4552
2512/F	2/1	220.2	0.0715	2.1215	0.9669	2.0342	7.2391	1.3422
M e a n:		234.1	0.0733	2.0392	0.9498	2.1055	8.0757	1.6050
Standard deviation:		14.7	0.0133	0.1588	0.1136	0.2603	1.0644	0.3816
Number of observ. :		(12)	(12)	(12)	(12)	(12)	(12)	(12)
3501/F	3/1	219.2	0.0875	1.9903	0.8780	2.1413	8.0163	1.6585
3502/F	3/1	227.7	0.0205	1.9486	0.8658	1.9807	7.0957	1.3804
3503/F	3/1	235.4	0.0527	2.0165	0.9774	1.9010	6.5255	1.4844
3504/F	3/1	245.9	0.0651	2.0518	0.8672	2.3064	7.6626	1.3700
3505/F	3/1	230.6	0.0680	2.0594	0.9994	1.9587	7.6505	1.5181
3506/F	3/1	227.2	0.0795	1.8426	0.8224	1.9990	7.2205	1.3862
3507/F	3/1	215.5	0.0613	2.1392	0.8936	2.3751	7.5926	1.8889
3508/F	3/1	238.6	0.0593	2.2329	1.0051	2.2080	8.2856	2.0731
3509/F	3/1	252.2	0.0761	2.0370	1.0579	1.9968	8.8936	1.6045
3510/F	3/1	219.9	0.0910	2.1295	0.9092	2.3805	7.2604	1.3968
3511/F	3/1	238.5	0.0695	2.1474	1.1810	2.0226	7.9026	1.9387
3512/F	3/1	215.9	0.0746	1.8288	0.9064	1.8572	7.7267	1.1387
M e a n:		230.6	0.0671	2.0353	0.9470	2.0939	7.6527	1.5699

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Animal No/sex	Group/ Subgroup	Terminal Body wt. (g)	Adrenal Glands	Brain	Heart	Kidneys	Liver	Lungs
Standard deviation:		11.9	0.0185	0.1213	0.1015	0.1833	0.6080	0.2756
Number of observ. :		(12)	(12)	(12)	(12)	(12)	(12)	(12)
4501/F	4/1	242.7	0.0764	2.0431	0.7944	1.8237	6.7258	1.5269
4502/F	4/1	227.8	0.0655	1.8693	0.7882	1.7909	7.4724	1.3052
4503/F	4/1	237.3	0.0662	1.9745	0.8653	2.1253	6.8676	1.4842
4504/F	4/1	220.9	0.0616	1.9130	0.8128	1.9413	6.8415	1.3070
4505/F	4/1	256.9	0.0822	1.9709	1.0514	2.1364	7.7241	1.9100
4506/F	4/1	218.4	0.0682	1.9381	0.7865	1.9997	7.7222	1.3147
4507/F	4/1	216.3	0.0657	2.1025	1.1013	2.1258	7.8485	1.3923
4508/F	4/1	206.2	0.0649	2.0909	0.8332	1.9025	8.4025	1.5472
4509/F	4/1	219.5	0.0955	1.9900	1.0751	1.9720	7.8815	1.6358
4510/F	4/1	233.2	0.0779	2.2204	1.0444	2.4574	8.7406	1.6075
4511/F	4/1	238.8	0.0746	2.1171	0.8591	2.3513	8.1932	1.3302
4512/F	4/1	229.9	0.0755	2.1521	0.9380	1.9558	8.4263	1.4226
M e a n:		229.0	0.0729	2.0318	0.9125	2.0485	7.7372	1.4820
Standard deviation:		13.8	0.0096	0.1062	0.1228	0.2011	0.6618	0.1792
Number of observ. :		(12)	(12)	(12)	(12)	(12)	(12)	(12)

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Animal No/sex	Group/ Subgroup	Terminal Body wt. (g)	Ovary Left	Ovary Right	Spleen	Thymus	Uterus w/vagina
				F e m a l e	A n i m a l s		
1501/F	1/1	212.7	0.0536	0.0638	0.5351	0.4168	1.1152
1502/F	1/1	239.9	0.0668	0.0690	0.5565	0.5392	1.0549
1503/F	1/1	248.0	0.0607	0.0479	0.5556	0.4946	1.0076
1504/F	1/1	232.5	0.0726	0.0655	0.4757	0.4261	0.5929
1505/F	1/1	239.8	0.0685	0.0586	0.6579	0.2300	0.6020
1506/F	1/1	221.3	0.0707	0.0817	0.5694	0.3245	0.6755
1507/F	1/1	224.3	0.0828	0.0672	0.5390	0.5140	0.7394
1508/F	1/1	219.0	0.0792	0.0605	0.5487	0.5101	0.6739
1509/F	1/1	233.4	0.0967	0.0706	0.6420	0.5912	1.0926
1510/F	1/1	239.0	0.0782	0.0779	0.6296	0.5444	0.7564
1511/F	1/1	242.2	0.0838	0.0773	0.4505	0.4109	0.7924
1512/F	1/1	277.2	0.0804	0.0814	0.5334	0.5498	0.7897
M e a n:		235.8	0.0745	0.0685	0.5578	0.4626	0.8244
Standard deviation:		16.8	0.0115	0.0101	0.0619	0.1053	0.1919
Number of observ. :		(12)	(12)	(12)	(12)	(12)	(12)
2501/F	2/1	206.2	0.0609	0.0587	0.4094	0.4133	0.5662
2502/F	2/1	257.4	0.0683	0.0752	0.4632	0.5784	0.6428
2503/F	2/1	232.9	0.0667	0.0591	0.4223	0.5403	1.2282
2504/F	2/1	237.4	0.0547	0.0472	0.5095	0.6311	0.7292
2505/F	2/1	228.0	0.0690	0.0687	0.3590	0.5027	0.7460
2506/F	2/1	233.0	0.0796	0.0965	0.6486	0.4183	0.8636
2507/F	2/1	248.5	0.0877	0.0847	0.6503	0.4582	1.5581
2508/F	2/1	228.9	0.0892	0.0590	0.6095	0.3347	0.5357
2509/F	2/1	250.4	0.0736	0.0604	0.6904	0.5831	0.7189
2510/F	2/1	220.7	0.0827	0.0568	0.4173	0.2536	0.9188
2511/F	2/1	245.7	0.1079	0.0672	0.7203	0.5510	0.8069
2512/F	2/1	220.2	0.0679	0.0713	0.4977	0.4546	0.5854
M e a n:		234.1	0.0757	0.0671	0.5331	0.4766	0.8250
Standard deviation:		14.7	0.0146	0.0135	0.1246	0.1103	0.2983
Number of observ. :		(12)	(12)	(12)	(12)	(12)	(12)
3501/F	3/1	219.2	0.0844	0.0667	0.4146	0.4952	0.7446
3502/F	3/1	227.7	0.0654	0.0575	0.4822	0.4598	0.7465
3503/F	3/1	235.4	0.0697	0.0655	0.4574	0.4313	0.6380
3504/F	3/1	245.9	0.0633	0.0774	0.6024	0.5957	1.2094
3505/F	3/1	230.6	0.0622	0.0617	0.5500	0.3537	0.7682
3506/F	3/1	227.2	0.0675	0.0524	0.4280	0.3743	0.9252
3507/F	3/1	215.5	0.0689	0.0560	0.4947	0.5617	0.9818
3508/F	3/1	238.6	0.1021	0.0653	0.5118	0.4381	1.6387
3509/F	3/1	252.2	0.0848	0.0781	0.5279	0.6190	0.9244
3510/F	3/1	219.9	0.1063	0.0668	0.5504	0.4844	1.3341
3511/F	3/1	238.5	0.1046	0.0752	0.6169	0.5195	0.5949
3512/F	3/1	215.9	0.0532	0.0513	0.4358	0.4485	0.5863
M e a n:		230.6	0.0777	0.0645	0.5060	0.4818	0.9243

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Summary statistics for absolute organ weights (g)
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Animal No/sex	Group/ Subgroup	Terminal Body wt. (g)	Ovary Left	Ovary Right	Spleen	Thymus	Uterus w/vagina
Standard deviation:		11.9	0.0183	0.0092	0.0664	0.0819	0.3242
Number of observ. :		(12)	(12)	(12)	(12)	(12)	(12)
4501/F	4/1	242.7	0.0498	0.0666	0.5547	0.5628	0.6360
4502/F	4/1	227.8	0.0567	0.0545	0.3903	0.3673	0.8439
4503/F	4/1	237.3	0.0731	0.0727	0.5629	0.4346	0.7593
4504/F	4/1	220.9	0.0660	0.0550	0.4706	0.3342	0.5136
4505/F	4/1	256.9	0.0743	0.0714	0.6938	0.6310	0.9815
4506/F	4/1	218.4	0.0800	0.0649	0.4444	0.3939	1.3299
4507/F	4/1	216.3	0.0878	0.0698	0.5356	0.4773	1.5047
4508/F	4/1	206.2	0.0973	0.0670	0.4539	0.3513	0.7714
4509/F	4/1	219.5	0.0708	0.0573	0.5553	0.4777	0.7424
4510/F	4/1	233.2	0.0915	0.0632	0.4950	0.4708	0.7274
4511/F	4/1	238.8	0.0992	0.0808	0.5814	0.5272	1.6234
4512/F	4/1	229.9	0.0945	0.0538	0.6481	0.3943	0.6034
M e a n:		229.0	0.0784	0.0648	0.5322	0.4519	0.9197
Standard deviation:		13.8	0.0161	0.0084	0.0869	0.0904	0.3664
Number of observ. :		(12)	(12)	(12)	(12)	(12)	(12)

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Summary Statistics for % Organ to Body Weight
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Animal No/sex	Group/ Subgroup	Terminal Body wt. (g)	Adrenal Glands	Brain	Epididymis Left	Epididymis Right	Heart	Kidneys
				M a l e	A n i m a l s			
1001/M	1/1	379.4	0.0191	0.5645	0.1603	0.1642	0.4219	0.9168
1002/M	1/1	366.5	0.0173	0.5967	0.1472	0.1591	0.4106	0.8907
1003/M	1/1	391.2	0.0144	0.5928	0.1460	0.1508	0.3901	0.9629
1004/M	1/1	371.0	0.0233	0.5975	0.1545	0.1688	0.4130	1.0219
1005/M	1/1	363.1	0.0292	0.5895	0.1879	0.1901	0.3574	1.0044
1006/M	1/1	393.0	0.0147	0.5735	0.1461	0.1449	0.3154	0.9741
1007/M	1/1	374.9	0.0239	0.6108	0.1710	0.1797	0.3906	1.0330
1008/M	1/1	395.1	0.0156	0.6034	0.1788	0.1773	0.4269	0.9307
1009/M	1/1	332.2	0.0180	0.7017	0.1784	0.1778	0.4225	1.0296
1010/M	1/1	431.7	0.0164	0.5587	0.1712	0.1701	0.3892	0.8959
1011/M	1/1	399.1	0.0177	0.5420	0.1442	0.1596	0.4804	0.9997
1012/M	1/1	332.8	0.0175	0.6481	0.1683	0.1784	0.3827	0.9469
	M e a n:	377.5	0.0189	0.5983	0.1628	0.1684	0.4000	0.9672
Standard deviation:		27.9	0.0044	0.0426	0.0151	0.0132	0.0405	0.0513
Number of observ. :		(12)	(12)	(12)	(12)	(12)	(12)	(12)
2001/M	2/1	346.4	0.0204	0.6594	0.2133	0.1791	0.3663	0.8693
2002/M	2/1	398.0	0.0127	0.5214	0.1278	0.1377	0.3222	0.8276
2003/M	2/1	333.6	0.0192	0.5965	0.1694	0.1677	0.3321	0.8133
2004/M	2/1	414.3	0.0177	0.5171	0.1602	0.1561	0.3622	0.8091
2005/M	2/1	367.0	0.0215	0.5844	0.1482	0.1793	0.3568	0.8454
2006/M	2/1	394.8	0.0172	0.5091	0.1760	0.1980	0.3911	0.9031
2007/M	2/1	391.5	0.0221	0.5950	0.1858	0.1883	0.4375	0.9543
2008/M	2/1	376.4	0.0073	0.5925	0.1658	0.1431	0.3409	0.8880
2009/M	2/1	392.1	0.0158	0.5831	0.1434	0.1358	0.4652	0.8128
2010/M	2/1	327.7	0.0175	0.7100	0.1976	0.1745	0.3946	1.0102
2011/M	2/1	334.5	0.0219	0.6324	0.1667	0.1622	0.3391	0.9534
2012/M	2/1	366.7	0.0208	0.6617	0.1528	0.1766	0.4557	0.8664
	M e a n:	370.3	0.0179	0.5969	0.1673	0.1665	0.3803	0.8794
Standard deviation:		29.1	0.0044	0.0620	0.0238	0.0200	0.0491	0.0652
Number of observ. :		(12)	(12)	(12)	(12)	(12)	(12)	(12)
3001/M	3/1	414.0	0.0159	0.5449	0.1290	0.1518	0.3344	0.8707
3002/M	3/1	373.2	0.0202	0.5372	0.1949	0.1793	0.3290	0.7991
3003/M	3/1	389.8	0.0173	0.5527	0.1561	0.1549	0.3309	0.8801
3004/M	3/1	454.3	0.0190	0.4645	0.1563	0.1612	0.3430	0.8612
3005/M	3/1	419.1	0.0191	0.5288	0.1550	0.1453	0.3097	0.8091
3006/M	3/1	371.1	0.0202	0.5870	0.1680	0.1743	0.4146	1.0108
3007/M	3/1	362.8	0.0176	0.6161	0.1844	0.1628	0.4768	1.0987
3008/M	3/1	371.4	0.0172	0.6773	0.1796	0.1671	0.4149	0.8823
3009/M	3/1	427.3	0.0167	0.5066	0.1339	0.1378	0.3764	0.9784
3010/M	3/1	352.3	0.0208	0.6535	0.1972	0.1905	0.3896	0.9798
3011/M	3/1	358.2	0.0184	0.6452	0.1668	0.1697	0.4290	0.9812
3012/M	3/1	349.5	0.0156	0.6327	0.1972	0.1667	0.3768	0.9687
	M e a n:	386.9	0.0182	0.5789	0.1682	0.1635	0.3771	0.9267

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Animal No/sex	Group/ Subgroup	Terminal Body wt. (g)	Adrenal Glands	Brain	Epididymis Left	Epididymis Right	Heart	Kidneys
Standard deviation:		33.9	0.0017	0.0663	0.0233	0.0147	0.0501	0.0897
Number of observ. :		(12)	(12)	(12)	(12)	(12)	(12)	(12)
4001/M	4/1	346.5	0.0185	0.6312	0.1991	0.1682	0.3772	0.9688
4002/M	4/1	356.0	0.0179	0.6087	0.1984	0.2080	0.3371	0.8886
4003/M	4/1	360.2	0.0175	0.5640	0.1614	0.1689	0.3232	0.8607
4004/M	4/1	318.7	0.0157	0.6846	0.1747	0.1942	0.3636	0.9449
4005/M	4/1	384.7	0.0175	0.6083	0.1794	0.1734	0.3592	0.8921
4006/M	4/1	346.5	0.0216	0.5668	0.1829	0.1889	0.3589	0.9709
4007/M	4/1	355.4	0.0180	0.6120	0.1729	0.1787	0.3940	0.9916
4008/M	4/1	374.4	0.0196	0.6417	0.1692	0.1737	0.5146	0.9623
4009/M	4/1	344.5	0.0156	0.6988	0.1727	0.2110	0.5060	0.8983
4010/M	4/1	372.2	0.0195	0.6397	0.1564	0.1487	0.4009	0.9820
4011/M	4/1	309.1	0.0196	0.7176	0.2099	0.2047	0.4542	1.0047
4012/M	4/1	357.7	0.0144	0.6138	0.1323	0.1373	0.3247	0.8717
M e a n:		352.2	0.0179	0.6323	0.1758	0.1797	0.3928	0.9364
Standard deviation:		21.7	0.0020	0.0481	0.0209	0.0229	0.0657	0.0508
Number of observ. :		(12)	(12)	(12)	(12)	(12)	(12)	(12)

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Animal No/sex	Group/ Subgroup	Terminal Body wt. (g)	Liver	Lungs	Spleen	Testis Left	Testis Right	Thymus
				Male Animals				
1001/M	1/1	379.4	3.0072	0.5165	0.2254	0.4250	0.4264	0.1564
1002/M	1/1	366.5	3.2062	0.5311	0.2035	0.4358	0.4362	0.1854
1003/M	1/1	391.2	3.6328	1.0140	0.1537	0.3735	0.3836	0.1100
1004/M	1/1	371.0	3.4455	0.5632	0.1967	0.4666	0.4472	0.1390
1005/M	1/1	363.1	3.5861	0.4963	0.2085	0.4646	0.4698	0.1708
1006/M	1/1	393.0	3.3376	0.4479	0.2439	0.4312	0.4056	0.1453
1007/M	1/1	374.9	3.6267	0.6231	0.1912	0.4401	0.4376	0.1900
1008/M	1/1	395.1	2.9196	0.5566	0.1970	0.4642	0.4542	0.1292
1009/M	1/1	332.2	2.9341	0.6155	0.1899	0.4360	0.4348	0.1920
1010/M	1/1	431.7	3.5790	0.5168	0.2310	0.4781	0.4712	0.1199
1011/M	1/1	399.1	3.1760	0.5870	0.2555	0.4665	0.4558	0.1221
1012/M	1/1	332.8	3.0235	0.6166	0.2055	0.4398	0.4514	0.1136
Mean:		377.5	3.2895	0.5904	0.2085	0.4434	0.4395	0.1478
Standard deviation:		27.9	0.2802	0.1437	0.0273	0.0281	0.0254	0.0305
Number of observ. :		(12)	(12)	(12)	(12)	(12)	(12)	(12)
2001/M	2/1	346.4	3.3808	0.5710	0.2252	0.5301	0.5204	0.2033
2002/M	2/1	398.0	3.3514	0.4198	0.1812	0.3781	0.3866	0.1265
2003/M	2/1	333.6	3.0401	0.4189	0.1567	0.4706	0.4716	0.1501
2004/M	2/1	414.3	3.4316	0.5392	0.1671	0.3508	0.3660	0.1583
2005/M	2/1	367.0	3.1750	0.5233	0.1769	0.4202	0.4187	0.1175
2006/M	2/1	394.8	3.3911	0.5590	0.1776	0.5095	0.5110	0.1217
2007/M	2/1	391.5	3.0058	0.6446	0.2370	0.4758	0.4714	0.1194
2008/M	2/1	376.4	3.2705	0.5654	0.2113	0.4666	0.4662	0.1295
2009/M	2/1	392.1	2.9012	0.5865	0.1875	0.4120	0.4096	0.1351
2010/M	2/1	327.7	4.0280	0.5781	0.1687	0.4592	0.4619	0.1116
2011/M	2/1	334.5	3.2904	0.5131	0.1940	0.4415	0.4271	0.1304
2012/M	2/1	366.7	2.8702	0.4846	0.1873	0.4327	0.4258	0.1060
Mean:		370.3	3.2614	0.5336	0.1892	0.4456	0.4447	0.1341
Standard deviation:		29.1	0.3106	0.0669	0.0241	0.0512	0.0472	0.0264
Number of observ. :		(12)	(12)	(12)	(12)	(12)	(12)	(12)
3001/M	3/1	414.0	3.4625	0.5785	0.1901	0.3743	0.3620	0.1656
3002/M	3/1	373.2	3.3868	0.5115	0.2132	0.4217	0.4119	0.1228
3003/M	3/1	389.8	3.0770	0.4646	0.2512	0.4264	0.4127	0.1293
3004/M	3/1	454.3	3.3101	0.4687	0.1960	0.3799	0.3831	0.1556
3005/M	3/1	419.1	3.1345	0.4223	0.1681	0.4371	0.4396	0.1266
3006/M	3/1	371.1	3.2009	0.5622	0.1716	0.4560	0.4463	0.1458
3007/M	3/1	362.8	3.2755	0.5927	0.2484	0.4718	0.4669	0.1180
3008/M	3/1	371.4	3.6983	0.6187	0.2247	0.5203	0.5048	0.1335
3009/M	3/1	427.3	3.1449	0.5249	0.2308	0.3797	0.3541	0.1216
3010/M	3/1	352.3	3.5488	0.5513	0.2051	0.4450	0.4516	0.1367
3011/M	3/1	358.2	3.1990	0.5264	0.1655	0.4524	0.4367	0.1144
3012/M	3/1	349.5	3.6073	0.5951	0.1669	0.4637	0.4304	0.1014
Mean:		386.9	3.3371	0.5347	0.2026	0.4357	0.4250	0.1309

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Animal No/sex	Group/ Subgroup	Terminal Body wt. (g)	Liver	Lungs	Spleen	Testis Left	Testis Right	Thymus
Standard deviation:		33.9	0.2032	0.0600	0.0314	0.0430	0.0434	0.0180
Number of observ. :		(12)	(12)	(12)	(12)	(12)	(12)	(12)
4001/M	4/1	346.5	3.1807	0.5192	0.2130	0.4192	0.4278	0.1287
4002/M	4/1	356.0	2.9615	0.5312	0.2085	0.4798	0.4877	0.1923
4003/M	4/1	360.2	3.0752	0.4197	0.2100	0.4269	0.4187	0.1620
4004/M	4/1	318.7	3.1412	0.4979	0.2249	0.4710	0.4725	0.1642
4005/M	4/1	384.7	3.4275	0.6159	0.1759	0.4764	0.4867	0.1388
4006/M	4/1	346.5	3.1022	0.4317	0.1705	0.4030	0.4405	0.1511
4007/M	4/1	355.4	3.5161	0.5634	0.2178	0.4681	0.4476	0.1501
4008/M	4/1	374.4	3.2540	0.5312	0.2542	0.4945	0.4931	0.1425
4009/M	4/1	344.5	3.3191	0.6501	0.2257	0.5754	0.5529	0.1061
4010/M	4/1	372.2	3.0660	0.5856	0.2052	0.4629	0.4689	0.1215
4011/M	4/1	309.1	3.0409	0.5436	0.1863	0.4824	0.5008	0.0854
4012/M	4/1	357.7	2.7403	0.4045	0.1424	0.3745	0.3805	0.1404
M e a n:		352.2	3.1521	0.5245	0.2029	0.4612	0.4648	0.1402
Standard deviation:		21.7	0.2093	0.0766	0.0298	0.0515	0.0451	0.0280
Number of observ. :		(12)	(12)	(12)	(12)	(12)	(12)	(12)

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Animal No/sex	Group/ Subgroup	Terminal Body wt. (g)	Adrenal Glands	Brain	Heart	Kidneys	Liver	Lungs
				F e m a l e	A n i m a l s			
1501/F	1/1	212.7	0.0248	0.9580	0.3829	0.9651	3.7470	0.7654
1502/F	1/1	239.9	0.0356	0.7835	0.3910	0.9475	3.4554	0.6928
1503/F	1/1	248.0	0.0266	0.7215	0.3654	0.7219	3.2566	0.5380
1504/F	1/1	232.5	0.0257	0.7908	0.3631	0.8501	3.5525	0.5152
1505/F	1/1	239.8	0.0280	0.8387	0.3832	0.7882	2.9904	0.5970
1506/F	1/1	221.3	0.0326	0.8767	0.3721	0.9252	4.2447	0.6644
1507/F	1/1	224.3	0.0358	0.8238	0.4086	0.9239	3.6486	0.6695
1508/F	1/1	219.0	0.0299	0.9400	0.4127	1.0850	3.5472	0.7500
1509/F	1/1	233.4	0.0347	0.8080	0.4700	0.9171	3.1084	0.6747
1510/F	1/1	239.0	0.0307	0.8682	0.4267	1.0594	3.3909	0.8739
1511/F	1/1	242.2	0.0331	0.8976	0.4102	0.7965	3.4114	0.7452
1512/F	1/1	277.2	0.0290	0.7611	0.3879	0.8363	3.8217	0.5009
M e a n:		235.8	0.0305	0.8390	0.3978	0.9014	3.5146	0.6656
Standard deviation:		16.8	0.0038	0.0717	0.0302	0.1083	0.3354	0.1122
Number of observ. :		(12)	(12)	(12)	(12)	(12)	(12)	(12)
2501/F	2/1	206.2	0.0333	0.8718	0.4048	0.8334	2.9507	0.5982
2502/F	2/1	257.4	0.0313	0.8153	0.3597	0.8417	3.9716	0.8146
2503/F	2/1	232.9	0.0308	0.8581	0.3773	0.9635	3.8026	0.8532
2504/F	2/1	237.4	0.0223	0.7343	0.5238	0.7474	3.0838	0.9991
2505/F	2/1	228.0	0.0311	0.8472	0.3930	0.9371	3.6920	0.5632
2506/F	2/1	233.0	0.0254	0.8386	0.3582	0.7974	3.1252	0.4904
2507/F	2/1	248.5	0.0425	0.8769	0.3792	0.9930	3.4119	0.6669
2508/F	2/1	228.9	0.0368	0.8991	0.4419	0.9872	3.4181	0.7782
2509/F	2/1	250.4	0.0260	0.9024	0.3702	0.9406	3.4539	0.5865
2510/F	2/1	220.7	0.0338	0.9735	0.3992	0.8281	3.4911	0.6524
2511/F	2/1	245.7	0.0302	0.8875	0.4295	0.9865	3.5937	0.5923
2512/F	2/1	220.2	0.0325	0.9634	0.4391	0.9238	3.2875	0.6095
M e a n:		234.1	0.0313	0.8723	0.4063	0.8983	3.4402	0.6837
Standard deviation:		14.7	0.0053	0.0637	0.0470	0.0843	0.3006	0.1471
Number of observ. :		(12)	(12)	(12)	(12)	(12)	(12)	(12)
3501/F	3/1	219.2	0.0399	0.9080	0.4005	0.9769	3.6571	0.7566
3502/F	3/1	227.7	0.0090	0.8558	0.3802	0.8699	3.1162	0.6062
3503/F	3/1	235.4	0.0224	0.8566	0.4152	0.8076	2.7721	0.6306
3504/F	3/1	245.9	0.0265	0.8344	0.3527	0.9379	3.1161	0.5571
3505/F	3/1	230.6	0.0295	0.8931	0.4334	0.8494	3.3176	0.6583
3506/F	3/1	227.2	0.0350	0.8110	0.3620	0.8798	3.1780	0.6101
3507/F	3/1	215.5	0.0284	0.9927	0.4147	1.1021	3.5232	0.8765
3508/F	3/1	238.6	0.0249	0.9358	0.4212	0.9254	3.4726	0.8689
3509/F	3/1	252.2	0.0302	0.8077	0.4195	0.7918	3.5264	0.6362
3510/F	3/1	219.9	0.0414	0.9684	0.4135	1.0825	3.3017	0.6352
3511/F	3/1	238.5	0.0291	0.9004	0.4952	0.8481	3.3135	0.8129
3512/F	3/1	215.9	0.0346	0.8471	0.4198	0.8602	3.5788	0.5274
M e a n:		230.6	0.0292	0.8842	0.4107	0.9110	3.3228	0.6813

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Animal No/sex	Group/ Subgroup	Terminal Body wt. (g)	Adrenal Glands	Brain	Heart	Kidneys	Liver	Lungs
Standard deviation:		11.9	0.0086	0.0596	0.0366	0.0996	0.2507	0.1181
Number of observ. :		(12)	(12)	(12)	(12)	(12)	(12)	(12)
4501/F	4/1	242.7	0.0315	0.8418	0.3273	0.7514	2.7712	0.6291
4502/F	4/1	227.8	0.0288	0.8206	0.3460	0.7862	3.2802	0.5730
4503/F	4/1	237.3	0.0279	0.8321	0.3646	0.8956	2.8941	0.6255
4504/F	4/1	220.9	0.0279	0.8660	0.3679	0.8788	3.0971	0.5917
4505/F	4/1	256.9	0.0320	0.7672	0.4093	0.8316	3.0067	0.7435
4506/F	4/1	218.4	0.0312	0.8874	0.3601	0.9156	3.5358	0.6020
4507/F	4/1	216.3	0.0304	0.9720	0.5092	0.9828	3.6285	0.6437
4508/F	4/1	206.2	0.0315	1.0140	0.4041	0.9226	4.0749	0.7503
4509/F	4/1	219.5	0.0435	0.9066	0.4898	0.8984	3.5907	0.7452
4510/F	4/1	233.2	0.0334	0.9521	0.4479	1.0538	3.7481	0.6893
4511/F	4/1	238.8	0.0312	0.8866	0.3598	0.9846	3.4310	0.5570
4512/F	4/1	229.9	0.0328	0.9361	0.4080	0.8507	3.6652	0.6188
M e a n:		229.0	0.0318	0.8902	0.3995	0.8960	3.3936	0.6474
Standard deviation:		13.8	0.0041	0.0704	0.0573	0.0857	0.3892	0.0685
Number of observ. :		(12)	(12)	(12)	(12)	(12)	(12)	(12)

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Animal No/sex	Group/ Subgroup	Terminal Body wt. (g)	Ovary Left	Ovary Right	Spleen	Thymus	Uterus w/vagina
				F e m a l e	A n i m a l s		
1501/F	1/1	212.7	0.0252	0.0300	0.2516	0.1960	0.5243
1502/F	1/1	239.9	0.0278	0.0288	0.2320	0.2248	0.4397
1503/F	1/1	248.0	0.0245	0.0193	0.2240	0.1994	0.4063
1504/F	1/1	232.5	0.0312	0.0282	0.2046	0.1833	0.2550
1505/F	1/1	239.8	0.0286	0.0244	0.2744	0.0959	0.2510
1506/F	1/1	221.3	0.0319	0.0369	0.2573	0.1466	0.3052
1507/F	1/1	224.3	0.0369	0.0300	0.2403	0.2292	0.3296
1508/F	1/1	219.0	0.0362	0.0276	0.2505	0.2329	0.3077
1509/F	1/1	233.4	0.0414	0.0302	0.2751	0.2533	0.4681
1510/F	1/1	239.0	0.0327	0.0326	0.2634	0.2278	0.3165
1511/F	1/1	242.2	0.0346	0.0319	0.1860	0.1697	0.3272
1512/F	1/1	277.2	0.0290	0.0294	0.1924	0.1983	0.2849
M e a n:		235.8	0.0317	0.0291	0.2376	0.1964	0.3513
Standard deviation:		16.8	0.0050	0.0043	0.0304	0.0436	0.0876
Number of observ. :		(12)	(12)	(12)	(12)	(12)	(12)
2501/F	2/1	206.2	0.0295	0.0285	0.1985	0.2004	0.2746
2502/F	2/1	257.4	0.0265	0.0292	0.1800	0.2247	0.2497
2503/F	2/1	232.9	0.0286	0.0254	0.1813	0.2320	0.5274
2504/F	2/1	237.4	0.0230	0.0199	0.2146	0.2658	0.3072
2505/F	2/1	228.0	0.0303	0.0301	0.1575	0.2205	0.3272
2506/F	2/1	233.0	0.0342	0.0414	0.2784	0.1795	0.3706
2507/F	2/1	248.5	0.0353	0.0341	0.2617	0.1844	0.6270
2508/F	2/1	228.9	0.0390	0.0258	0.2663	0.1462	0.2340
2509/F	2/1	250.4	0.0294	0.0241	0.2757	0.2329	0.2871
2510/F	2/1	220.7	0.0375	0.0257	0.1891	0.1149	0.4163
2511/F	2/1	245.7	0.0439	0.0274	0.2932	0.2243	0.3284
2512/F	2/1	220.2	0.0308	0.0324	0.2260	0.2064	0.2658
M e a n:		234.1	0.0323	0.0287	0.2269	0.2027	0.3513
Standard deviation:		14.7	0.0058	0.0055	0.0464	0.0414	0.1191
Number of observ. :		(12)	(12)	(12)	(12)	(12)	(12)
3501/F	3/1	219.2	0.0385	0.0304	0.1891	0.2259	0.3397
3502/F	3/1	227.7	0.0287	0.0253	0.2118	0.2019	0.3278
3503/F	3/1	235.4	0.0296	0.0278	0.1943	0.1832	0.2710
3504/F	3/1	245.9	0.0257	0.0315	0.2450	0.2423	0.4918
3505/F	3/1	230.6	0.0270	0.0268	0.2385	0.1534	0.3331
3506/F	3/1	227.2	0.0297	0.0231	0.1884	0.1647	0.4072
3507/F	3/1	215.5	0.0320	0.0260	0.2296	0.2606	0.4556
3508/F	3/1	238.6	0.0428	0.0274	0.2145	0.1836	0.6868
3509/F	3/1	252.2	0.0336	0.0310	0.2093	0.2454	0.3665
3510/F	3/1	219.9	0.0483	0.0304	0.2503	0.2203	0.6067
3511/F	3/1	238.5	0.0439	0.0315	0.2587	0.2178	0.2494
3512/F	3/1	215.9	0.0246	0.0238	0.2019	0.2077	0.2716
M e a n:		230.6	0.0337	0.0279	0.2193	0.2089	0.4006

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Animal No/sex	Group/ Subgroup	Terminal Body wt. (g)	Ovary Left	Ovary Right	Spleen	Thymus	Uterus w/vagina
Standard deviation:		11.9	0.0078	0.0030	0.0245	0.0330	0.1371
Number of observ. :		(12)	(12)	(12)	(12)	(12)	(12)
4501/F	4/1	242.7	0.0205	0.0274	0.2286	0.2319	0.2621
4502/F	4/1	227.8	0.0249	0.0239	0.1713	0.1612	0.3705
4503/F	4/1	237.3	0.0308	0.0306	0.2372	0.1831	0.3200
4504/F	4/1	220.9	0.0299	0.0249	0.2130	0.1513	0.2325
4505/F	4/1	256.9	0.0289	0.0278	0.2701	0.2456	0.3821
4506/F	4/1	218.4	0.0366	0.0297	0.2035	0.1804	0.6089
4507/F	4/1	216.3	0.0406	0.0323	0.2476	0.2207	0.6957
4508/F	4/1	206.2	0.0472	0.0325	0.2201	0.1704	0.3741
4509/F	4/1	219.5	0.0323	0.0261	0.2530	0.2176	0.3382
4510/F	4/1	233.2	0.0392	0.0271	0.2123	0.2019	0.3119
4511/F	4/1	238.8	0.0415	0.0338	0.2435	0.2208	0.6798
4512/F	4/1	229.9	0.0411	0.0234	0.2819	0.1715	0.2625
M e a n:		229.0	0.0345	0.0283	0.2318	0.1964	0.4032
Standard deviation:		13.8	0.0078	0.0035	0.0304	0.0307	0.1638
Number of observ. :		(12)	(12)	(12)	(12)	(12)	(12)

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Animal No/sex	Group/ Subgroup	Terminal Body wt. (g)	Adrenal Glands	Epididymis Left	Epididymis Right	Heart	Kidneys	Liver
				M a l e	A n i m a l s			
1001/M	1/1	379.4	3.3852	28.3887	29.0937	74.7397	162.4084	532.7311
1002/M	1/1	366.5	2.8944	24.6685	26.6667	68.8066	149.2593	537.2932
1003/M	1/1	391.2	2.4278	24.6313	25.4420	65.7999	162.4321	612.8245
1004/M	1/1	371.0	3.9020	25.8526	28.2569	69.1267	171.0303	576.6330
1005/M	1/1	363.1	4.9572	31.8787	32.2572	60.6270	170.3920	608.3867
1006/M	1/1	393.0	2.5557	25.4814	25.2640	54.9960	169.8642	581.9816
1007/M	1/1	374.9	3.9085	27.9969	29.4249	63.9417	169.1253	593.7552
1008/M	1/1	395.1	2.5838	29.6338	29.3780	70.7395	154.2427	483.8472
1009/M	1/1	332.2	2.5695	25.4204	25.3432	60.2136	146.7142	418.1109
1010/M	1/1	431.7	2.9395	30.6385	30.4478	69.6517	160.3483	640.5722
1011/M	1/1	399.1	3.2640	26.6066	29.4545	88.6315	184.4614	586.0056
1012/M	1/1	332.8	2.6936	25.9713	27.5197	59.0450	146.0964	466.4951
M e a n:		377.5	3.1734	27.2640	28.2124	67.1932	162.1979	553.2197
Standard deviation:		27.9	0.7579	2.4204	2.2152	8.8473	11.6025	67.1373
Number of observ. :		(12)	(12)	(12)	(12)	(12)	(12)	(12)
2001/M	2/1	346.4	3.0996	32.3483	27.1649	55.5468	131.8273	512.7003
2002/M	2/1	398.0	2.4384	24.5097	26.4084	61.7898	158.7297	642.7883
2003/M	2/1	333.6	3.2213	28.3934	28.1120	55.6711	136.3486	509.6638
2004/M	2/1	414.3	3.4262	30.9761	30.1872	70.0509	156.4627	663.6373
2005/M	2/1	367.0	3.6837	25.3614	30.6817	61.0603	144.6750	543.3275
2006/M	2/1	394.8	3.3829	34.5754	38.8936	76.8071	177.3842	666.0465
2007/M	2/1	391.5	3.7220	31.2312	31.6476	73.5340	160.3889	505.1816
2008/M	2/1	376.4	1.2287	27.9776	24.1570	57.5381	149.8924	552.0314
2009/M	2/1	392.1	2.7116	24.5922	23.2889	79.7726	139.3877	497.5203
2010/M	2/1	327.7	2.4583	27.8322	24.5702	55.5785	142.2769	567.2941
2011/M	2/1	334.5	3.4696	26.3626	25.6441	53.6138	150.7445	520.2742
2012/M	2/1	366.7	3.1362	23.0909	26.6886	68.8646	130.9376	433.7523
M e a n:		370.3	2.9982	28.1042	28.1203	64.1523	148.2546	551.1848
Standard deviation:		29.1	0.7035	3.5552	4.2961	9.2373	13.5526	72.2993
Number of observ. :		(12)	(12)	(12)	(12)	(12)	(12)	(12)
3001/M	3/1	414.0	2.9171	23.6734	27.8672	61.3690	159.8085	635.4923
3002/M	3/1	373.2	3.7661	36.2797	33.3716	61.2411	148.7704	630.5034
3003/M	3/1	389.8	3.1375	28.2326	28.0284	59.8580	159.2268	556.6834
3004/M	3/1	454.3	4.0987	33.6429	34.6996	73.8296	185.3914	712.5616
3005/M	3/1	419.1	3.6145	29.3173	27.4762	58.5759	153.0211	592.7802
3006/M	3/1	371.1	3.4475	28.6127	29.6961	70.6252	172.1860	545.2902
3007/M	3/1	362.8	2.8545	29.9271	26.4239	77.4015	178.3365	531.6765
3008/M	3/1	371.4	2.5443	26.5167	24.6760	61.2587	130.2775	546.0564
3009/M	3/1	427.3	3.2985	26.4391	27.2106	74.3093	193.1350	620.8076
3010/M	3/1	352.3	3.1794	30.1785	29.1535	59.6230	149.9327	543.0353
3011/M	3/1	358.2	2.8515	25.8578	26.2948	66.4921	152.0791	495.8159
3012/M	3/1	349.5	2.4647	31.1641	26.3477	59.5559	153.1115	570.1610
M e a n:		386.9	3.1812	29.1535	28.4371	65.3449	161.2730	581.7386

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Animal No/sex	Group/ Subgroup	Terminal Body wt. (g)	Adrenal Glands	Epididymis Left	Epididymis Right	Heart	Kidneys	Liver
Standard deviation:		33.9	0.4920	3.4773	2.9502	6.8652	17.7824	59.3762
Number of observ. :		(12)	(12)	(12)	(12)	(12)	(12)	(12)
4001/M	4/1	346.5	2.9355	31.5409	26.6484	59.7622	153.4934	503.9369
4002/M	4/1	356.0	2.9395	32.5888	34.1671	55.3853	145.9852	486.5252
4003/M	4/1	360.2	3.1059	28.6178	29.9419	57.3095	152.6088	545.2206
4004/M	4/1	318.7	2.2872	25.5260	28.3724	53.1145	138.0300	458.8624
4005/M	4/1	384.7	2.8802	29.4945	28.5116	59.0445	146.6604	563.4631
4006/M	4/1	346.5	3.8136	32.2658	33.3350	63.3249	171.2933	547.3117
4007/M	4/1	355.4	2.9331	28.2457	29.2019	64.3665	162.0127	574.4897
4008/M	4/1	374.4	3.0466	26.3620	27.0654	80.1890	149.9438	507.0504
4009/M	4/1	344.5	2.2264	24.7144	30.1931	72.3988	128.5483	474.9408
4010/M	4/1	372.2	3.0535	24.4529	23.2517	62.6696	153.5092	479.2978
4011/M	4/1	309.1	2.7276	29.2548	28.5244	63.2974	140.0072	423.7545
4012/M	4/1	357.7	2.3503	21.5532	22.3730	52.8991	142.0132	446.4633
M e a n:		352.2	2.8583	27.8847	28.4655	61.9801	148.6755	500.9430
Standard deviation:		21.7	0.4335	3.4328	3.4576	7.9185	11.2910	48.1702
Number of observ. :		(12)	(12)	(12)	(12)	(12)	(12)	(12)

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Animal No/sex	Group/ Subgroup	Terminal Body wt. (g)	Lungs	Spleen	Testis Left	Testis Right	Thymus
				Male Animals			
1001/M	1/1	379.4	91.5021	39.9262	75.2953	75.5335	27.7070
1002/M	1/1	366.5	88.9986	34.1061	73.0361	73.0956	31.0745
1003/M	1/1	391.2	171.0565	25.9250	63.0099	64.7132	18.5597
1004/M	1/1	371.0	94.2620	32.9213	78.0946	74.8466	23.2588
1005/M	1/1	363.1	84.2031	35.3735	78.8114	79.7085	28.9772
1006/M	1/1	393.0	78.0992	42.5326	75.1841	70.7294	25.3350
1007/M	1/1	374.9	102.0176	31.3070	72.0512	71.6363	31.1018
1008/M	1/1	395.1	92.2487	32.6496	76.9221	75.2779	21.4043
1009/M	1/1	332.2	87.7102	27.0676	62.1354	61.9638	27.3636
1010/M	1/1	431.7	92.5000	41.3433	85.5721	84.3325	21.4677
1011/M	1/1	399.1	108.3079	47.1429	86.0749	84.0915	22.5335
1012/M	1/1	332.8	95.1275	31.7061	67.8489	69.6384	17.5243
	Mean:	377.5	98.8361	35.1668	74.5030	73.7973	24.6923
Standard deviation:		27.9	24.0309	6.3883	7.5819	6.8266	4.6095
Number of observ. :		(12)	(12)	(12)	(12)	(12)	(12)
2001/M	2/1	346.4	86.5993	34.1520	80.3914	78.9248	30.8292
2002/M	2/1	398.0	80.5118	34.7550	72.5266	74.1507	24.2543
2003/M	2/1	333.6	70.2297	26.2727	78.8984	79.0593	25.1671
2004/M	2/1	414.3	104.2851	32.3204	67.8476	70.7744	30.6120
2005/M	2/1	367.0	89.5458	30.2667	71.9155	71.6544	20.1063
2006/M	2/1	394.8	109.7906	34.8838	100.0746	100.3731	23.9093
2007/M	2/1	391.5	108.3369	39.8257	79.9605	79.2264	20.0695
2008/M	2/1	376.4	95.4395	35.6726	78.7623	78.6951	21.8520
2009/M	2/1	392.1	100.5773	32.1539	70.6582	70.2340	23.1620
2010/M	2/1	327.7	81.4165	23.7580	64.6682	65.0464	15.7212
2011/M	2/1	334.5	81.1345	30.6689	69.8133	67.5254	20.6192
2012/M	2/1	366.7	73.2372	28.3083	65.3864	64.3520	16.0190
	Mean:	370.3	90.0920	31.9198	75.0753	75.0013	22.6934
Standard deviation:		29.1	13.4815	4.4154	9.6456	9.6672	4.7758
Number of observ. :		(12)	(12)	(12)	(12)	(12)	(12)
3001/M	3/1	414.0	106.1710	34.8983	68.6926	66.4317	30.3852
3002/M	3/1	373.2	95.2262	39.6917	78.4955	76.6798	22.8663
3003/M	3/1	389.8	84.0481	45.4423	77.1466	74.6635	23.4011
3004/M	3/1	454.3	100.8861	42.1863	81.7902	82.4678	33.5055
3005/M	3/1	419.1	79.8655	31.7991	82.6542	83.1416	23.9430
3006/M	3/1	371.1	95.7767	29.2279	77.6900	76.0283	24.8302
3007/M	3/1	362.8	96.2105	40.3203	76.5782	75.7908	19.1490
3008/M	3/1	371.4	91.3533	33.1836	76.8188	74.5369	19.7066
3009/M	3/1	427.3	103.6127	45.5511	74.9607	69.8975	24.0044
3010/M	3/1	352.3	84.3548	31.3817	68.0884	69.1048	20.9182
3011/M	3/1	358.2	81.5802	25.6545	70.1225	67.6777	17.7361
3012/M	3/1	349.5	94.0530	26.3793	73.2860	68.0219	16.0320
	Mean:	386.9	92.7615	35.4763	75.5270	73.7035	23.0398

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Summary Statistics for % Organ to Brain Weight
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Animal No/sex	Group/ Subgroup	Terminal Body wt. (g)	Lungs	Spleen	Testis Left	Testis Right	Thymus
Standard deviation:		33.9	8.6980	7.0144	4.7243	5.5859	5.0144
Number of observ. :		(12)	(12)	(12)	(12)	(12)	(12)
4001/M	4/1	346.5	82.2588	33.7403	66.4243	67.7823	20.3932
4002/M	4/1	356.0	87.2589	34.2547	78.8233	80.1246	31.5921
4003/M	4/1	360.2	74.4044	37.2268	75.6842	74.2420	28.7163
4004/M	4/1	318.7	72.7277	32.8597	68.7996	69.0150	23.9859
4005/M	4/1	384.7	101.2521	28.9176	78.3172	80.0051	22.8110
4006/M	4/1	346.5	76.1711	30.0764	71.0947	77.7139	26.6548
4007/M	4/1	355.4	92.0559	35.5921	76.4757	73.1381	24.5219
4008/M	4/1	374.4	82.7694	39.6096	77.0508	76.8302	22.2084
4009/M	4/1	344.5	93.0218	32.2949	82.3344	79.1194	15.1776
4010/M	4/1	372.2	91.5410	32.0845	72.3592	73.3000	18.9970
4011/M	4/1	309.1	75.7585	25.9637	67.2242	69.7850	11.8976
4012/M	4/1	357.7	65.9030	23.1929	61.0157	61.9995	22.8695
M e a n:		352.2	82.9269	32.1511	72.9669	73.5879	22.4854
Standard deviation:		21.7	10.3485	4.6123	6.2297	5.6094	5.4599
Number of observ. :		(12)	(12)	(12)	(12)	(12)	(12)

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Summary Statistics for % Organ to Brain Weight
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Animal No/sex	Group/ Subgroup	Terminal Body wt. (g)	Adrenal Glands	Heart	Kidneys	Liver	Lungs	Ovary Left
				Female Animals				
1501/F	1/1	212.7	2.5913	39.9686	100.7460	391.1415	79.8930	2.6305
1502/F	1/1	239.9	4.5488	49.8989	120.9300	441.0301	88.4231	3.5539
1503/F	1/1	248.0	3.6830	50.6511	100.0615	451.3665	74.5655	3.3924
1504/F	1/1	232.5	3.2527	45.9233	107.5061	449.2521	65.1564	3.9489
1505/F	1/1	239.8	3.3411	45.6869	93.9790	356.5356	71.1778	3.4058
1506/F	1/1	221.3	3.7213	42.4389	105.5252	484.1563	75.7809	3.6440
1507/F	1/1	224.3	4.3514	49.6076	112.1557	442.9183	81.2686	4.4812
1508/F	1/1	219.0	3.1819	43.9058	115.4336	377.3816	79.7960	3.8475
1509/F	1/1	233.4	4.2897	58.1632	113.4949	384.6917	83.4986	5.1275
1510/F	1/1	239.0	3.5327	49.1494	122.0252	390.5875	100.6603	3.7689
1511/F	1/1	242.2	3.6845	45.6946	88.7397	380.0506	83.0175	3.8546
1512/F	1/1	277.2	3.8106	50.9645	109.8773	502.0996	65.8041	3.8106
	Mean:	235.8	3.6657	47.6711	107.5395	420.9343	79.0868	3.7888
Standard deviation:		16.8	0.5515	4.7910	10.2565	46.7465	9.8064	0.6051
Number of observ. :		(12)	(12)	(12)	(12)	(12)	(12)	(12)
2501/F	2/1	206.2	3.8162	46.4286	95.5997	338.4736	68.6137	3.3879
2502/F	2/1	257.4	3.8405	44.1130	103.2353	487.1063	99.9047	3.2544
2503/F	2/1	232.9	3.5927	43.9730	112.2842	443.1424	99.4346	3.3375
2504/F	2/1	237.4	3.0346	71.3343	101.7898	419.9748	136.0601	3.1379
2505/F	2/1	228.0	3.6654	46.3864	110.6130	435.7890	66.4837	3.5722
2506/F	2/1	233.0	3.0246	42.7124	95.0819	372.6510	58.4800	4.0737
2507/F	2/1	248.5	4.8506	43.2472	113.2440	389.0827	76.0498	4.0246
2508/F	2/1	228.9	4.0914	49.1545	109.8008	380.1749	86.5500	4.3343
2509/F	2/1	250.4	2.8855	41.0250	104.2353	382.7492	64.9894	3.2572
2510/F	2/1	220.7	3.4720	41.0081	85.0600	358.5963	67.0111	3.8490
2511/F	2/1	245.7	3.4029	48.3972	111.1580	404.9438	66.7370	4.9484
2512/F	2/1	220.2	3.3703	45.5762	95.8850	341.2256	63.2666	3.2006
	Mean:	234.1	3.5872	46.9463	103.1656	396.1591	79.4651	3.6981
Standard deviation:		14.7	0.5378	8.1073	8.8139	44.1979	22.5572	0.5587
Number of observ. :		(12)	(12)	(12)	(12)	(12)	(12)	(12)
3501/F	3/1	219.2	4.3963	44.1140	107.5868	402.7685	83.3291	4.2406
3502/F	3/1	227.7	1.0520	44.4319	101.6473	364.1435	70.8406	3.3563
3503/F	3/1	235.4	2.6134	48.4701	94.2723	323.6053	73.6127	3.4565
3504/F	3/1	245.9	3.1728	42.2653	112.4086	373.4575	66.7706	3.0851
3505/F	3/1	230.6	3.3019	48.5287	95.1102	371.4917	73.7156	3.0203
3506/F	3/1	227.2	4.3146	44.6326	108.4880	391.8648	75.2307	3.6633
3507/F	3/1	215.5	2.8656	41.7726	111.0275	354.9271	88.2994	3.2208
3508/F	3/1	238.6	2.6557	45.0132	98.8849	371.0691	92.8434	4.5725
3509/F	3/1	252.2	3.7359	51.9342	98.0265	436.6029	78.7678	4.1630
3510/F	3/1	219.9	4.2733	42.6955	111.7868	340.9439	65.5929	4.9918
3511/F	3/1	238.5	3.2365	54.9967	94.1883	368.0078	90.2813	4.8710
3512/F	3/1	215.9	4.0792	49.5626	101.5529	422.5011	62.2649	2.9090
	Mean:	230.6	3.3081	46.5348	102.9150	376.7819	76.7958	3.7958

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Animal No/sex	Group/ Subgroup	Terminal Body wt. (g)	Adrenal Glands	Heart	Kidneys	Liver	Lungs	Ovary Left
Standard deviation:		11.9	0.9593	4.1507	7.0253	32.2909	10.0588	0.7430
Number of observ. :		(12)	(12)	(12)	(12)	(12)	(12)	(12)
4501/F	4/1	242.7	3.7394	38.8821	89.2614	329.1958	74.7345	2.4375
4502/F	4/1	227.8	3.5040	42.1655	95.8059	399.7433	69.8229	3.0332
4503/F	4/1	237.3	3.3527	43.8238	107.6374	347.8147	75.1684	3.7022
4504/F	4/1	220.9	3.2201	42.4882	101.4794	357.6320	68.3220	3.4501
4505/F	4/1	256.9	4.1707	53.3462	108.3972	391.9073	96.9100	3.7699
4506/F	4/1	218.4	3.5189	40.5810	103.1784	398.4418	67.8345	4.1278
4507/F	4/1	216.3	3.1249	52.3805	101.1082	373.2937	66.2212	4.1760
4508/F	4/1	206.2	3.1039	39.8489	90.9895	401.8605	73.9968	4.6535
4509/F	4/1	219.5	4.7990	54.0251	99.0955	396.0553	82.2010	3.5578
4510/F	4/1	233.2	3.5084	47.0366	110.6738	393.6498	72.3969	4.1209
4511/F	4/1	238.8	3.5237	40.5791	111.0623	387.0011	62.8312	4.6857
4512/F	4/1	229.9	3.5082	43.5853	90.8787	391.5385	66.1029	4.3911
M e a n:		229.0	3.5895	44.8952	100.7973	380.6778	73.0452	3.8421
Standard deviation:		13.8	0.4765	5.4802	7.7995	23.6115	9.1502	0.6625
Number of observ. :		(12)	(12)	(12)	(12)	(12)	(12)	(12)

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Animal No/sex	Group/ Subgroup	Terminal Body wt. (g)	Ovary Right	Spleen	Thymus	Uterus w/vagina
				Female Animals		
1501/F	1/1	212.7	3.1311	26.2613	20.4554	54.7311
1502/F	1/1	239.9	3.6710	29.6074	28.6870	56.1236
1503/F	1/1	248.0	2.6770	31.0513	27.6421	56.3125
1504/F	1/1	232.5	3.5627	25.8744	23.1765	32.2491
1505/F	1/1	239.8	2.9135	32.7102	11.4354	29.9309
1506/F	1/1	221.3	4.2109	29.3475	16.7251	34.8160
1507/F	1/1	224.3	3.6370	29.1714	27.8184	40.0173
1508/F	1/1	219.0	2.9390	26.6553	24.7802	32.7374
1509/F	1/1	233.4	3.7436	34.0421	31.3484	57.9352
1510/F	1/1	239.0	3.7544	30.3436	26.2374	36.4548
1511/F	1/1	242.2	3.5557	20.7222	18.9006	36.4489
1512/F	1/1	277.2	3.8580	25.2808	26.0581	37.4283
Mean:		235.8	3.4712	28.4223	23.6054	42.0988
Standard deviation:		16.8	0.4547	3.6536	5.7353	10.8072
Number of observ. :		(12)	(12)	(12)	(12)	(12)
2501/F	2/1	206.2	3.2655	22.7748	22.9918	31.4976
2502/F	2/1	257.4	3.5832	22.0708	27.5599	30.6285
2503/F	2/1	232.9	2.9572	21.1309	27.0353	61.4561
2504/F	2/1	237.4	2.7077	29.2279	36.2035	41.8311
2505/F	2/1	228.0	3.5566	18.5856	26.0251	38.6208
2506/F	2/1	233.0	4.9386	33.1935	21.4074	44.1965
2507/F	2/1	248.5	3.8869	29.8426	21.0270	71.5020
2508/F	2/1	228.9	2.8669	29.6161	16.2634	26.0301
2509/F	2/1	250.4	2.6730	30.5541	25.8055	31.8154
2510/F	2/1	220.7	2.6436	19.4219	11.8030	42.7627
2511/F	2/1	245.7	3.0819	33.0337	25.2694	37.0053
2512/F	2/1	220.2	3.3608	23.4598	21.4282	27.5937
Mean:		234.1	3.2935	26.0760	23.5683	40.4117
Standard deviation:		14.7	0.6542	5.3462	6.1004	13.7058
Number of observ. :		(12)	(12)	(12)	(12)	(12)
3501/F	3/1	219.2	3.3513	20.8310	24.8807	37.4114
3502/F	3/1	227.7	2.9508	24.7460	23.5964	38.3096
3503/F	3/1	235.4	3.2482	22.6829	21.3885	31.6390
3504/F	3/1	245.9	3.7723	29.3596	29.0330	58.9434
3505/F	3/1	230.6	2.9960	26.7068	17.1749	37.3021
3506/F	3/1	227.2	2.8438	23.2281	20.3137	50.2117
3507/F	3/1	215.5	2.6178	23.1255	26.2575	45.8957
3508/F	3/1	238.6	2.9244	22.9209	19.6202	73.3889
3509/F	3/1	252.2	3.8341	25.9156	30.3878	45.3805
3510/F	3/1	219.9	3.1369	25.8464	22.7471	62.6485
3511/F	3/1	238.5	3.5019	28.7278	24.1921	27.7033
3512/F	3/1	215.9	2.8051	23.8298	24.5243	32.0593
Mean:		230.6	3.1652	24.8267	23.6764	45.0744

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Summary Statistics for % Organ to Brain Weight
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Animal No/sex	Group/ Subgroup	Terminal Body wt. (g)	Ovary Right	Spleen	Thymus	Uterus w/vagina
Standard deviation:		11.9	0.3857	2.5614	3.8015	13.9695
Number of observ. :		(12)	(12)	(12)	(12)	(12)
4501/F	4/1	242.7	3.2598	27.1499	27.5464	31.1292
4502/F	4/1	227.8	2.9155	20.8795	19.6491	45.1452
4503/F	4/1	237.3	3.6819	28.5085	22.0106	38.4553
4504/F	4/1	220.9	2.8751	24.6001	17.4699	26.8479
4505/F	4/1	256.9	3.6227	35.2022	32.0158	49.7996
4506/F	4/1	218.4	3.3486	22.9297	20.3240	68.6188
4507/F	4/1	216.3	3.3199	25.4744	22.7015	71.5672
4508/F	4/1	206.2	3.2044	21.7084	16.8014	36.8932
4509/F	4/1	219.5	2.8794	27.9045	24.0050	37.3065
4510/F	4/1	233.2	2.8463	22.2933	21.2034	32.7599
4511/F	4/1	238.8	3.8165	27.4621	24.9020	76.6804
4512/F	4/1	229.9	2.4999	30.1148	18.3216	28.0377
M e a n:		229.0	3.1892	26.1856	22.2459	45.2701
Standard deviation:		13.8	0.3971	4.0968	4.4039	17.6240
Number of observ. :		(12)	(12)	(12)	(12)	(12)

	Individual Animal Gross and Microscopic Observations Main Study Preface	Appendix L

Key to Abbreviations

LN	=	Lymph Node
Oviducts/Fallop	=	Oviducts/Fallopian Tubes
SC	=	Spinal Cord

Corresponding exposure levels for each group were as follows:

Group 1 - 0 ppm
Group 2 - 1200 ppm
Group 3 - 4000 ppm
Group 4 - 12000 ppm

Note

Unless otherwise specified in a histopathology note, the organ/tissue examined was the required (routine) section.

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Propane: Combined Repeated-Exposure Toxicity,
Reproduction and Neurotoxicity Screening in Rats
via Whole-Body Inhalation Exposures
Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice | SEX: Male | ANIMAL: 1001
PHASE DAY OF DEATH: 29 | PHASE: Dosing phase | GROUP: 1

Tissue	Gross Observations/Comments	Microscopic Observations/Comments
Kidneys	No gross observations on tissue.	CORTEX: CONVOLUTED TUBULAR EPITHELIUM-BASOPHILIC, UNILATERAL, Focal, Minimal.
Liver	Mass, Tan, Firm, 1.6 - 1.9 cm/ with red area 1.0-1.5 cm on the surface	MICROGRANULOMATOUS FOCI, Multifocal, Minimal. INFARCTION WITH HEMORRHAGE, BILIARY HYPERPLASIA, GRANULOMATOUS INFLAMMATION, GRANULATION TISSUE, AND MINERALIZATION, Focal, Severe. - PANCREATIC TISSUE MISIDENTIFIED AT NECROPSY. TAN, PANCREATIC MASS IS ACTUALLY AN INFARCTION OF THE LIVER.
Mesenteric LN	No gross observations on tissue.	CORTICAL LYMPHOCYTES/UNIT AREA, Slight. PARACORTICAL LYMPHOCYTES/UNIT AREA, Marked. FOLLICULAR GERMINAL CENTER DEVELOPMENT, Moderate. PROMINENT HISTIOCYTES, Multifocal, Minimal. PROMINENT PLASMA CELLS, Multifocal, Slight.
Mediastinal LN	No gross observations on tissue.	CORTICAL LYMPHOCYTES/UNIT AREA, Slight.

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Propane: Combined Repeated-Exposure Toxicity,
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via Whole-Body Inhalation Exposures
Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice	SEX: Male	ANIMAL: 1001
PHASE DAY OF DEATH: 29	PHASE: Dosing phase	GROUP: 1

Tissue	Gross Observations/Comments	Microscopic Observations/Comments
Mediastinal LN		PARACORTICAL LYMPHOCYTES/UNIT AREA, Slight. FREE ERYTHROCYTES/ERYTHROPHAGOCYTOSIS, Multifocal, Minimal. BROWN PIGMENT, Slight.
Lungs	No gross observations on tissue.	PERIALVEOLAR/PERIVASCULAR SUBACUTE/CHRONIC INFLAMMATORY CELL INFILTRATE, Multifocal, Minimal. ALVEOLAR/INTRAALVEOLAR MACROPHAGES, Multifocal, Minimal. - LOBES ARE PARTIALLY ATELECTATIC.
Mammary-protocol . . .	No gross observations on tissue.	MALE TYPE: (UNDIFFRENTIATED TYPE), Present.
Tibial Nerve	No gross observations on tissue.	Tissue is unremarkable (with comment). - TISSUE IS FRAGMENTED, BUT READABLE.
Skin-protocol	No gross observations on tissue.	FOLLICULAR DILATATION/HAIR FOLLICLES: EMPTY/WITHOUT HAIRSHAFT, Multifocal, Minimal.
Thymus	No gross observations on tissue.	INVOLUTION/CORTICAL LYMPHOCYTOSIS, Minimal. HEMORRHAGE, Multifocal, Minimal.

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Propane: Combined Repeated-Exposure Toxicity,
Reproduction and Neurotoxicity Screening in Rats
via Whole-Body Inhalation Exposures
Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice	SEX: Male	ANIMAL: 1001
PHASE DAY OF DEATH: 29	PHASE: Dosing phase	GROUP: 1

Tissue	Gross Observations/Comments	Microscopic Observations/Comments

Tissues without comment under Gross Observations were within normal limits at necropsy.
The following tissues were unremarkable microscopically:

Adrenal Glands	Sternal Marrow	Femoral Marrow	Brain	Sternum
Femur	Cecum	Colon	Duodenum	Epididymides
Heart	Ileum	Jejunum	Prostate	Parathyroid
Rectum/Low Colon	Cervical SC	Thoracic SC	Lumbar SC	Spleen
Stomach	Seminal vesicles	Testes	Thyroid	Trachea
Urinary bladder				

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Propane: Combined Repeated-Exposure Toxicity,
Reproduction and Neurotoxicity Screening in Rats
via Whole-Body Inhalation Exposures
Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice | SEX: Male | ANIMAL: 1002
PHASE DAY OF DEATH: 29 | PHASE: Dosing phase | GROUP: 1

Tissue	Gross Observations/Comments	Microscopic Observations/Comments
Kidneys	No gross observations on tissue.	CORTICAL TUBULAR DILATATION, UNILATERAL, Focal, Minimal. INTERSTITIAL MONONUCLEAR CELL AGGREGATES, UNILATERAL, Focal, Minimal.
Liver	No gross observations on tissue.	SUBACUTE/CHRONIC INFLAMMATORY CELL FOCI, Multifocal, Minimal. MICROGRANULOMATOUS FOCI, Focal, Minimal.
Mesenteric LN	No gross observations on tissue.	CORTICAL LYMPHOCYTES/UNIT AREA, Slight. PARACORTICAL LYMPHOCYTES/UNIT AREA, Marked. FOLLICULAR GERMINAL CENTER DEVELOPMENT, Multifocal, Moderate. PROMINENT HISTIOCYTES, Multifocal, Minimal. PROMINENT PLASMA CELLS, Multifocal, Minimal.
Mediastinal LN	No gross observations on tissue.	CORTICAL LYMPHOCYTES/UNIT AREA, Moderate. PARACORTICAL LYMPHOCYTES/UNIT AREA, Moderate. FREE ERYTHROCYTES/ERYTHROPHAGOCYTOSIS, Multifocal, Minimal.

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Propane: Combined Repeated-Exposure Toxicity,
Reproduction and Neurotoxicity Screening in Rats
via Whole-Body Inhalation Exposures
Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice | SEX: Male | ANIMAL: 1002
PHASE DAY OF DEATH: 29 | PHASE: Dosing phase | GROUP: 1

Tissue	Gross Observations/Comments	Microscopic Observations/Comments
Lungs	No gross observations on tissue.	PERIALVEOLAR/PERIVASCULAR SUBACUTE/CHRONIC INFLAMMATORY CELL INFILTRATE, Multifocal, Minimal. ALVEOLAR/INTRAALVEOLAR MACROPHAGES, Multifocal, Minimal. VESSEL MINERALIZATION, Minimal. - LOBES ARE PARTIALLY ATELECTATIC.
Mammary-protocol	No gross observations on tissue.	MALE TYPE: (UNDIFFRENTIATED TYPE), Present.
Tibial Nerve	No gross observations on tissue.	Tissue is unremarkable (with comment). - TISSUE IS FRAGMENTED, BUT READABLE.
Prostate	No gross observations on tissue.	INTERSTITIAL MONONUCLEAR CELL AGGREGATES, Multifocal, Slight.
Parathyroid	No gross observations on tissue.	Tissue is missing. - TISSUE MISSING FROM SLIDE
Testes	No gross observations on tissue.	SERTOLI CELL VACUOLATION, BILATERAL, Multifocal, Minimal.
Thymus	No gross observations on tissue.	INVOLUTION/CORTICAL LYMPHOCYTOSIS, Minimal.

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Propane: Combined Repeated-Exposure Toxicity,
Reproduction and Neurotoxicity Screening in Rats
via Whole-Body Inhalation Exposures
Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice	SEX: Male	ANIMAL: 1002
PHASE DAY OF DEATH: 29	PHASE: Dosing phase	GROUP: 1

Tissue	Gross Observations/Comments	Microscopic Observations/Comments

Tissues without comment under Gross Observations were within normal limits at necropsy.
The following tissues were unremarkable microscopically:

Adrenal Glands	Sternal Marrow	Femoral Marrow	Brain	Sternum
Femur	Cecum	Colon	Duodenum	Epididymides
Heart	Ileum	Jejunum	Rectum/Low Colon	Cervical SC
Thoracic SC	Lumbar SC	Skin-protocol	Spleen	Stomach
Seminal vesicles	Thyroid	Trachea	Urinary bladder	

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Propane: Combined Repeated-Exposure Toxicity,
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via Whole-Body Inhalation Exposures
Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice | SEX: Male | ANIMAL: 1003
PHASE DAY OF DEATH: 29 | PHASE: Dosing phase | GROUP: 1

Tissue	Gross Observations/Comments	Microscopic Observations/Comments
Heart	No gross observations on tissue.	SUBACUTE/CHRONIC INFLAMMATORY CELL INFILTRATE, Multifocal, Minimal.
Mesenteric LN	No gross observations on tissue.	CORTICAL LYMPHOCYTES/UNIT AREA, Slight. PARACORTICAL LYMPHOCYTES/UNIT AREA, Marked. FOLLICULAR GERMINAL CENTER DEVELOPMENT, Multifocal, Minimal. FREE ERYTHROCYTES/ERYTHROPHAGOCYTOSIS, Multifocal, Minimal. PROMINENT HISTIOCYTES, Multifocal, Minimal. PROMINENT PLASMA CELLS, Slight.
Mediastinal LN	No gross observations on tissue.	CORTICAL LYMPHOCYTES/UNIT AREA, Slight. PARACORTICAL LYMPHOCYTES/UNIT AREA, Moderate. FOLLICULAR GERMINAL CENTER DEVELOPMENT, Multifocal, Moderate. FREE ERYTHROCYTES/ERYTHROPHAGOCYTOSIS, Multifocal, Slight. PROMINENT PLASMA CELLS, Multifocal, Minimal.

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Propane: Combined Repeated-Exposure Toxicity,
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Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice | SEX: Male | ANIMAL: 1003
PHASE DAY OF DEATH: 29 | PHASE: Dosing phase | GROUP: 1

Tissue	Gross Observations/Comments	Microscopic Observations/Comments
Lungs	No gross observations on tissue.	ALVEOLAR/INTRAALVEOLAR MACROPHAGES, Multifocal, Minimal.
Mammary-protocol	No gross observations on tissue.	MALE TYPE: (UNDIFFRENTIATED TYPE), Present.
Prostate	No gross observations on tissue.	INTERSTITIAL MONONUCLEAR CELL AGGREGATES, Multifocal, Minimal.
Lumbar SC	No gross observations on tissue.	Tissue is unremarkable (with comment). - TISSUE IS FRAGMENTED, BUT READABLE.
Skin (other)	Hair Thin/Absent, Forelegs, Moderate	Examined; no correlation found FOLLICULAR DILATATION, Multifocal, Minimal.
Thymus	No gross observations on tissue.	INVOLUTION/CORTICAL LYMPHOCYTOSIS, Minimal. HEMORRHAGE, Multifocal, Minimal.
Trachea	No gross observations on tissue.	SUBACUTE/CHRONIC INFLAMMATORY CELL INFILTRATE, Focal, Minimal.

Tissues without comment under Gross Observations were within normal limits at necropsy.
The following tissues were unremarkable microscopically:
Adrenal Glands Sternal Marrow Femoral Marrow Brain Sternum

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Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice	SEX: Male	ANIMAL: 1003
PHASE DAY OF DEATH: 29	PHASE: Dosing phase	GROUP: 1

Tissue	Gross Observations/Comments	Microscopic Observations/Comments

Tissues without comment under Gross Observations were within normal limits at necropsy.
The following tissues were unremarkable microscopically:

Femur	Cecum	Colon	Duodenum	Epididymides
Ileum	Jejunum	Kidneys	Liver	Tibial Nerve
Parathyroid	Rectum/Low Colon	Cervical SC	Thoracic SC	Skin-protocol
Spleen	Stomach	Seminal vesicles	Testes	Thyroid
Urinary bladder				

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Propane: Combined Repeated-Exposure Toxicity,
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Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice | SEX: Male | ANIMAL: 1004
PHASE DAY OF DEATH: 29 | PHASE: Dosing phase | GROUP: 1

Tissue	Gross Observations/Comments	Microscopic Observations/Comments
Kidneys	No gross observations on tissue.	CORTEX: CONVOLUTED TUBULAR EPITHELIUM-BASOPHILIC, UNILATERAL, Focal, Minimal. MEDULLA: MINERAL DEPOSIT(S), UNILATERAL, Focal, Minimal.
Mesenteric LN	No gross observations on tissue.	CORTICAL LYMPHOCYTES/UNIT AREA, Minimal. PARACORTICAL LYMPHOCYTES/UNIT AREA, Marked. FOLLICULAR GERMINAL CENTER DEVELOPMENT, Multifocal, Moderate. FREE ERYTHROCYTES/ERYTHROPHAGOCYTOSIS, Multifocal, Minimal. PROMINENT HISTIOCYTES, Multifocal, Minimal. PROMINENT PLASMA CELLS, Multifocal, Minimal.
Mediastinal LN	No gross observations on tissue.	CORTICAL LYMPHOCYTES/UNIT AREA, Minimal. PARACORTICAL LYMPHOCYTES/UNIT AREA, Marked. FOLLICULAR GERMINAL CENTER DEVELOPMENT, Multifocal, Slight.
Lungs	No gross observations on tissue.	ALVEOLAR/INTRAALVEOLAR MACROPHAGES, Multifocal, Minimal.

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Propane: Combined Repeated-Exposure Toxicity,
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Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice | SEX: Male | ANIMAL: 1004
PHASE DAY OF DEATH: 29 | PHASE: Dosing phase | GROUP: 1

Tissue	Gross Observations/Comments	Microscopic Observations/Comments
Lungs		- LOBES ARE PARTIALLY ATELECTATIC.
Mammary-protocol	No gross observations on tissue.	MALE TYPE: (UNDIFFRENTIATED TYPE), Present.
Tibial Nerve	No gross observations on tissue.	Tissue is unremarkable (with comment). - TISSUE IS FRAGMENTED, BUT READABLE.
Prostate	No gross observations on tissue.	INTERSTITIAL MONONUCLEAR CELL AGGREGATES, Multifocal, Minimal.
Parathyroid	No gross observations on tissue.	Tissue is unremarkable; one-of-pair missing.
Thymus	No gross observations on tissue.	INVOLUTION/CORTICAL LYMPHOCYTOSIS, Minimal. HEMORRHAGE, Multifocal, Minimal.

Tissues without comment under Gross Observations were within normal limits at necropsy.
The following tissues were unremarkable microscopically:

Adrenal Glands	Sternal Marrow	Femoral Marrow	Brain	Sternum
Femur	Cecum	Colon	Duodenum	Epididymides

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Propane: Combined Repeated-Exposure Toxicity,
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STATUS: Final phase sacrifice			SEX: Male		ANIMAL: 1004
PHASE DAY OF DEATH: 29			PHASE: Dosing phase		GROUP: 1
Tissue	Gross Observations/Comments		Microscopic Observations/Comments		
Heart	Ileum	Jejunum	Liver	Rectum/Low Colon	
Cervical SC	Thoracic SC	Lumbar SC	Skin-protocol	Spleen	
Stomach	Seminal vesicles	Testes	Thyroid	Trachea	
Urinary bladder					

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Propane: Combined Repeated-Exposure Toxicity,
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STATUS: Final phase sacrifice | SEX: Male | ANIMAL: 1005
PHASE DAY OF DEATH: 29 | PHASE: Dosing phase | GROUP: 1

Tissue	Gross Observations/Comments	Microscopic Observations/Comments
Kidneys	No gross observations on tissue.	PELVIC DILATATION, UNILATERAL, Slight.
Liver	No gross observations on tissue.	SUBACUTE/CHRONIC INFLAMMATORY CELL FOCI, Multifocal, Minimal.
Mesenteric LN	No gross observations on tissue.	CORTICAL LYMPHOCYTES/UNIT AREA, Slight. PARACORTICAL LYMPHOCYTES/UNIT AREA, Marked. FOLLICULAR GERMINAL CENTER DEVELOPMENT, Multifocal, Moderate. PROMINENT HISTIOCYTES, Multifocal, Slight.
Mediastinal LN	No gross observations on tissue.	CORTICAL LYMPHOCYTES/UNIT AREA, Slight. PARACORTICAL LYMPHOCYTES/UNIT AREA, Marked. PROMINENT HISTIOCYTES, Multifocal, Slight. PROMINENT PLASMA CELLS, Multifocal, Minimal.
Lungs	No gross observations on tissue.	PERIALVEOLAR/PERIVASCULAR SUBACUTE/CHRONIC INFLAMMATORY CELL INFILTRATE, Multifocal, Minimal. ALVEOLAR/INTRAALVEOLAR MACROPHAGES, Multifocal, Minimal. VESSEL MINERALIZATION, Multifocal, Minimal.

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Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice | SEX: Male | ANIMAL: 1005
PHASE DAY OF DEATH: 29 | PHASE: Dosing phase | GROUP: 1

Tissue	Gross Observations/Comments	Microscopic Observations/Comments
Lungs		- LOBES ARE PARTIALLY ATELECTATIC.
Mammary-protocol . . .	No gross observations on tissue.	MALE TYPE: (UNDIFFRENTIATED TYPE), Present.
Tibial Nerve	No gross observations on tissue.	Tissue is unremarkable (with comment). - TISSUE IS FRAGMENTED, BUT READABLE.
Parathyroid	No gross observations on tissue.	Tissue is unremarkable; one-of-pair missing.
Skin-protocol	No gross observations on tissue.	FOLLICULAR DILATATION/HAIR FOLLICLES: EMPTY/WITHOUT HAIRSHAFT, Multifocal, Minimal.
Skin (other)	Hair Thin/Absent, Forelegs, Severe	Examined; 2 correlations found: HAIR FOLLICLES: EMPTY/HAIR SHAFT ABSENT, BILATERAL, Multifocal, Slight. FOLLICULAR DILATATION, BILATERAL, Multifocal, Minimal.
Testes	No gross observations on tissue.	SERTOLI CELL VACUOLATION, BILATERAL, Focal, Minimal.
Thymus	No gross observations on tissue.	INVOLUTION/CORTICAL LYMPHOCYTOSIS, Minimal. HEMORRHAGE, Focal, Minimal.

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Propane: Combined Repeated-Exposure Toxicity,
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Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice | SEX: Male | ANIMAL: 1005
PHASE DAY OF DEATH: 29 | PHASE: Dosing phase | GROUP: 1

Tissue	Gross Observations/Comments	Microscopic Observations/Comments

Tissues without comment under Gross Observations were within normal limits at necropsy.
The following tissues were unremarkable microscopically:

Adrenal Glands	Sternal Marrow	Femoral Marrow	Brain	Sternum
Femur	Cecum	Colon	Duodenum	Epididymides
Heart	Ileum	Jejunum	Prostate	Rectum/Low Colon
Cervical SC	Thoracic SC	Lumbar SC	Spleen	Stomach
Seminal vesicles	Thyroid	Trachea	Urinary bladder	

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Propane: Combined Repeated-Exposure Toxicity,
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Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice | SEX: Male | ANIMAL: 1006
PHASE DAY OF DEATH: 29 | PHASE: Dosing phase | GROUP: 1

Tissue	Gross Observations/Comments	Microscopic Observations/Comments
Heart	No gross observations on tissue.	SUBACUTE/CHRONIC INFLAMMATORY CELL INFILTRATE, Multifocal, Minimal.
Mesenteric LN	No gross observations on tissue.	CORTICAL LYMPHOCYTES/UNIT AREA, Minimal. PARACORTICAL LYMPHOCYTES/UNIT AREA, Marked. FOLLICULAR GERMINAL CENTER DEVELOPMENT, Multifocal, Moderate. FREE ERYTHROCYTES/ERYTHROPHAGOCYTOSIS, Minimal. PROMINENT HISTIOCYTES, Multifocal, Minimal. PROMINENT PLASMA CELLS, Multifocal, Slight.
Mediastinal LN	No gross observations on tissue.	CORTICAL LYMPHOCYTES/UNIT AREA, Minimal. PARACORTICAL LYMPHOCYTES/UNIT AREA, Moderate. FOLLICULAR GERMINAL CENTER DEVELOPMENT, Focal, Moderate.
Lungs	No gross observations on tissue.	SUBACUTE/CHRONIC INFLAMMATORY CELL FOCI, Multifocal, Minimal. ALVEOLAR/INTRAALVEOLAR MACROPHAGES, Multifocal, Minimal.

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Propane: Combined Repeated-Exposure Toxicity,
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via Whole-Body Inhalation Exposures
Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice	SEX: Male	ANIMAL: 1006
PHASE DAY OF DEATH: 29	PHASE: Dosing phase	GROUP: 1

Tissue	Gross Observations/Comments	Microscopic Observations/Comments
		- LOBES ARE PARTIALLY ATELECTATIC.
Mammary-protocol	No gross observations on tissue.	MALE TYPE: (UNDIFFRENTIATED TYPE), Present.
Parathyroid	No gross observations on tissue.	Tissue is missing.
		- TISSUE MISSING FROM SLIDE
Cervical SC	No gross observations on tissue.	Tissue is unremarkable (with comment).
		- TISSUE IS FRAGMENTED, BUT READABLE.
Lumbar SC	No gross observations on tissue.	Tissue is unremarkable (with comment).
		- TISSUE IS FRAGMENTED, BUT READABLE.
Testes	No gross observations on tissue.	SERTOLI CELL VACUOLATION, UNILATERAL, Focal, Minimal.
Thymus	No gross observations on tissue.	INVOLUTION/CORTICAL LYMPHOCYTOSIS, Minimal.
		HEMORRHAGE, Multifocal, Minimal.

Tissues without comment under Gross Observations were within normal limits at necropsy.
The following tissues were unremarkable microscopically:
Adrenal Glands Sternal Marrow Femoral Marrow Brain Sternum

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Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice	SEX: Male	ANIMAL: 1006
PHASE DAY OF DEATH: 29	PHASE: Dosing phase	GROUP: 1

Tissue	Gross Observations/Comments	Microscopic Observations/Comments

Tissues without comment under Gross Observations were within normal limits at necropsy.
The following tissues were unremarkable microscopically:

Femur	Cecum	Colon	Duodenum	Epididymides
Ileum	Jejunum	Kidneys	Liver	Tibial Nerve
Prostate	Rectum/Low Colon	Thoracic SC	Skin-protocol	Spleen
Stomach	Seminal vesicles	Thyroid	Trachea	Urinary bladder

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via Whole-Body Inhalation Exposures
Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice	SEX: Male	ANIMAL: 1007
PHASE DAY OF DEATH: 30	PHASE: Dosing phase	GROUP: 1

Tissue	Gross Observations/Comments	Microscopic Observations/Comments
Heart	No gross observations on tissue.	SUBACUTE/CHRONIC INFLAMMATORY CELL INFILTRATE, Multifocal, Minimal.
Kidneys	No gross observations on tissue.	PELVIC DILATATION, UNILATERAL, Moderate.
Mesenteric LN	No gross observations on tissue.	CORTICAL LYMPHOCYTES/UNIT AREA, Moderate. PARACORTICAL LYMPHOCYTES/UNIT AREA, Marked. FOLLICULAR GERMINAL CENTER DEVELOPMENT, Multifocal, Moderate. PROMINENT HISTIOCYTES, Multifocal, Minimal.
Mediastinal LN	No gross observations on tissue.	CORTICAL LYMPHOCYTES/UNIT AREA, Moderate. PARACORTICAL LYMPHOCYTES/UNIT AREA, Marked. FOLLICULAR GERMINAL CENTER DEVELOPMENT, Multifocal, Slight. FREE ERYTHROCYTES/ERYTHROPHAGOCYTOSIS, Multifocal, Slight. PROMINENT PLASMA CELLS, Minimal.
Lungs	No gross observations on tissue.	Tissue is unremarkable (with comment). - LOBES ARE PARTIALLY ATELECTATIC.

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via Whole-Body Inhalation Exposures
Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice | SEX: Male | ANIMAL: 1007
PHASE DAY OF DEATH: 30 | PHASE: Dosing phase | GROUP: 1

Tissue	Gross Observations/Comments	Microscopic Observations/Comments
Mammary-protocol	No gross observations on tissue.	MALE TYPE: (UNDIFFRENTIATED TYPE), Present.
Parathyroid	No gross observations on tissue.	Tissue is unremarkable; one-of-pair missing.
Skin-protocol	No gross observations on tissue.	FOLLICULAR DILATATION/HAIR FOLLICLES: EMPTY/WITHOUT HAIRSHAFT, Multifocal, Minimal. DECREASE/FEW HAIR FOLLICLES/APPENDAGES, Multifocal, Minimal.
Testes	No gross observations on tissue.	SERTOLI CELL VACUOLATION, UNILATERAL, Focal, Minimal.
Thyroid	No gross observations on tissue.	Tissue is unremarkable; one-of-pair missing.
Thymus	No gross observations on tissue.	INVOLUTION/CORTICAL LYMPHOCYTOSIS, Minimal. HEMORRHAGE, Multifocal, Minimal.

Tissues without comment under Gross Observations were within normal limits at necropsy.
The following tissues were unremarkable microscopically:
Adrenal Glands Sternal Marrow Femoral Marrow Brain Sternum

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Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice	SEX: Male	ANIMAL: 1007
PHASE DAY OF DEATH: 30	PHASE: Dosing phase	GROUP: 1

Tissue	Gross Observations/Comments	Microscopic Observations/Comments

Tissues without comment under Gross Observations were within normal limits at necropsy.
The following tissues were unremarkable microscopically:

Femur	Cecum	Colon	Duodenum	Epididymides
Ileum	Jejunum	Liver	Tibial Nerve	Prostate
Rectum/Low Colon	Cervical SC	Thoracic SC	Lumbar SC	Spleen
Stomach	Seminal vesicles	Trachea	Urinary bladder	

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via Whole-Body Inhalation Exposures
Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice	SEX: Male	ANIMAL: 1008
PHASE DAY OF DEATH: 30	PHASE: Dosing phase	GROUP: 1

Tissue	Gross Observations/Comments	Microscopic Observations/Comments
Liver	No gross observations on tissue.	SUBACUTE/CHRONIC INFLAMMATORY CELL FOCI, Multifocal, Minimal.
Mesenteric LN	No gross observations on tissue.	CORTICAL LYMPHOCYTES/UNIT AREA, Slight. PARACORTICAL LYMPHOCYTES/UNIT AREA, Moderate. FOLLICULAR GERMINAL CENTER DEVELOPMENT, Multifocal, Moderate. PROMINENT HISTIOCYTES, Multifocal, Minimal.
Mediastinal LN	No gross observations on tissue.	CORTICAL LYMPHOCYTES/UNIT AREA, Minimal. FOLLICULAR GERMINAL CENTER DEVELOPMENT, Multifocal, Minimal. FREE ERYTHROCYTES/ERYTHROPHAGOCYTOSIS, Multifocal, Slight. BROWN PIGMENT, Focal, Slight. PROMINENT PLASMA CELLS, Marked.
Lungs	No gross observations on tissue.	ALVEOLAR/INTRAALVEOLAR MACROPHAGES, Multifocal, Minimal. VESSEL MINERALIZATION, Multifocal, Minimal. - LOBES ARE PARTIALLY ATELECTATIC.

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STATUS: Final phase sacrifice	SEX: Male	ANIMAL: 1008
PHASE DAY OF DEATH: 30	PHASE: Dosing phase	GROUP: 1

Tissue	Gross Observations/Comments	Microscopic Observations/Comments
Mammary-protocol	No gross observations on tissue.	MALE TYPE: (UNDIFFRENTIATED TYPE), Present.
Tibial Nerve	No gross observations on tissue.	Tissue is unremarkable (with comment). - TISSUE IS FRAGMENTED, BUT READABLE.
Prostate	No gross observations on tissue.	INTERSTITIAL MONONUCLEAR CELL AGGREGATES, Multifocal, Minimal. MICROGRANULOMATOUS INFLAMMATORY CELL INFILTRATE, Focal, Minimal.
Parathyroid	No gross observations on tissue.	Tissue is missing. - TISSUE MISSING FROM SLIDE
Skin-protocol	No gross observations on tissue.	FOLLICULAR DILATATION/HAIR FOLLICLES: EMPTY/WITHOUT HAIRSHAFT, Multifocal, Minimal.
Thyroid	No gross observations on tissue.	Tissue is unremarkable; one-of-pair missing.
Thymus	No gross observations on tissue.	INVOLUTION/CORTICAL LYMPHOCYTOSIS, Minimal. HEMORRHAGE, Multifocal, Minimal.

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STATUS: Final phase sacrifice	SEX: Male	ANIMAL: 1008
PHASE DAY OF DEATH: 30	PHASE: Dosing phase	GROUP: 1

Tissue	Gross Observations/Comments	Microscopic Observations/Comments

Tissues without comment under Gross Observations were within normal limits at necropsy.
The following tissues were unremarkable microscopically:

Adrenal Glands	Sternal Marrow	Femoral Marrow	Brain	Sternum
Femur	Cecum	Colon	Duodenum	Epididymides
Heart	Ileum	Jejunum	Kidneys	Rectum/Low Colon
Cervical SC	Thoracic SC	Lumbar SC	Spleen	Stomach
Seminal vesicles	Testes	Trachea	Urinary bladder	

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STATUS: Final phase sacrifice | SEX: Male | ANIMAL: 1009
PHASE DAY OF DEATH: 30 | PHASE: Dosing phase | GROUP: 1

Tissue	Gross Observations/Comments	Microscopic Observations/Comments
Adrenal Glands	No gross observations on tissue.	Tissue is unremarkable (with comment). - ONLY ONE MEDULLA PRESENT
Heart	No gross observations on tissue.	SUBACUTE/CHRONIC INFLAMMATORY CELL INFILTRATE, Multifocal, Minimal.
Kidneys	No gross observations on tissue.	PELVIC DILATATION, UNILATERAL, Moderate.
Liver	No gross observations on tissue.	SUBACUTE/CHRONIC INFLAMMATORY CELL FOCI, Minimal.
Mesenteric LN	No gross observations on tissue.	CORTICAL LYMPHOCYTES/UNIT AREA, Moderate. PARACORTICAL LYMPHOCYTES/UNIT AREA, Marked. FOLLICULAR GERMINAL CENTER DEVELOPMENT, Multifocal, Moderate. PROMINENT HISTIOCYTES, Multifocal, Minimal. PROMINENT PLASMA CELLS, Multifocal, Minimal.
Mediastinal LN	No gross observations on tissue.	CORTICAL LYMPHOCYTES/UNIT AREA, Moderate. PARACORTICAL LYMPHOCYTES/UNIT AREA, Moderate. FOLLICULAR GERMINAL CENTER DEVELOPMENT, Multifocal, Minimal.

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Propane: Combined Repeated-Exposure Toxicity,
Reproduction and Neurotoxicity Screening in Rats
via Whole-Body Inhalation Exposures
Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice | SEX: Male | ANIMAL: 1009
PHASE DAY OF DEATH: 30 | PHASE: Dosing phase | GROUP: 1

Tissue	Gross Observations/Comments	Microscopic Observations/Comments
Mediastinal LN		FREE ERYTHROCYTES/ERYTHROPHAGOCYTOSIS, Minimal. PROMINENT HISTIOCYTES, Multifocal, Minimal.
Lungs	No gross observations on tissue.	PERIALVEOLAR/PERIVASCULAR SUBACUTE/CHRONIC INFLAMMATORY CELL INFILTRATE, Minimal. SUBACUTE/CHRONIC INFLAMMATORY CELL FOCI, Multifocal, Minimal. ALVEOLAR/INTRAALVEOLAR MACROPHAGES, Multifocal, Minimal. INTERSTITIAL FIBROSIS, Multifocal, Slight. - LOBES ARE PARTIALLY ATELECTATIC.
Mammary-protocol . . .	No gross observations on tissue.	MALE TYPE: (UNDIFFRENTIATED TYPE), Present.
Tibial Nerve	No gross observations on tissue.	Tissue is unremarkable (with comment). - TISSUE IS FRAGMENTED, BUT READABLE.
Prostate	No gross observations on tissue.	INTERSTITIAL MONONUCLEAR CELL AGGREGATES, Multifocal, Minimal.
Parathyroid	No gross observations on tissue.	Tissue is missing. - TISSUE MISSING FROM SLIDE

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Propane: Combined Repeated-Exposure Toxicity,
Reproduction and Neurotoxicity Screening in Rats
via Whole-Body Inhalation Exposures
Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice	SEX: Male	ANIMAL: 1009
PHASE DAY OF DEATH: 30	PHASE: Dosing phase	GROUP: 1

Tissue	Gross Observations/Comments	Microscopic Observations/Comments
Thymus	No gross observations on tissue.	INVOLUTION/CORTICAL LYMPHOCYTOSIS, Minimal. HEMORRHAGE, Multifocal, Minimal.

Tissues without comment under Gross Observations were within normal limits at necropsy.
The following tissues were unremarkable microscopically:

Sternal Marrow	Femoral Marrow	Brain	Sternum	Femur
Cecum	Colon	Duodenum	Epididymides	Ileum
Jejunum	Rectum/Low Colon	Cervical SC	Thoracic SC	Lumbar SC
Skin-protocol	Spleen	Stomach	Seminal vesicles	Testes
Thyroid	Trachea	Urinary bladder		

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Propane: Combined Repeated-Exposure Toxicity,
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via Whole-Body Inhalation Exposures
Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice	SEX: Male	ANIMAL: 1010
PHASE DAY OF DEATH: 30	PHASE: Dosing phase	GROUP: 1

Tissue	Gross Observations/Comments	Microscopic Observations/Comments
Heart	No gross observations on tissue.	SUBACUTE/CHRONIC INFLAMMATORY CELL INFILTRATE, Multifocal, Minimal.
Liver	No gross observations on tissue.	Tissue is unremarkable (with comment). - TISSUE IS FRAGMENTED, BUT READABLE.
Mesenteric LN	No gross observations on tissue.	CORTICAL LYMPHOCYTES/UNIT AREA, Minimal. PARACORTICAL LYMPHOCYTES/UNIT AREA, Marked. FOLLICULAR GERMINAL CENTER DEVELOPMENT, Multifocal, Slight. FREE ERYTHROCYTES/ERYTHROPHAGOCYTOSIS, Multifocal, Minimal. PROMINENT HISTIOCYTES, Multifocal, Minimal. PROMINENT PLASMA CELLS, Multifocal, Slight.
Mediastinal LN	No gross observations on tissue.	CORTICAL LYMPHOCYTES/UNIT AREA, Moderate. FOLLICULAR GERMINAL CENTER DEVELOPMENT, Moderate. FREE ERYTHROCYTES/ERYTHROPHAGOCYTOSIS, Slight. PROMINENT PLASMA CELLS, Slight. - PARACORTICAL LYMPHOCYTES/UNIT AREA NOT

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Propane: Combined Repeated-Exposure Toxicity,
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via Whole-Body Inhalation Exposures
Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice	SEX: Male	ANIMAL: 1010
PHASE DAY OF DEATH: 30	PHASE: Dosing phase	GROUP: 1

Tissue	Gross Observations/Comments	Microscopic Observations/Comments
		PRESENT/NOT EVALUATED.
Lungs	Discolored, All lobes, Red, Foci, </= 0.1 cm, Slight	Examined; no correlation found
		VESSEL MINERALIZATION, Multifocal, Minimal.
Mammary-protocol . . .	No gross observations on tissue.	MALE TYPE: (UNDIFFRENTIATED TYPE), Present.
Tibial Nerve	No gross observations on tissue.	Tissue is unremarkable (with comment).
		- TISSUE IS FRAGMENTED, BUT READABLE.
Prostate	No gross observations on tissue.	INTERSTITIAL MONONUCLEAR CELL AGGREGATES, Focal, Minimal.
Parathyroid	No gross observations on tissue.	Tissue is unremarkable; one-of-pair missing.
Thyroid	No gross observations on tissue.	ULTIMOBRANCHIAL REST(S), UNILATERAL, Focal, Minimal.
Thymus	No gross observations on tissue.	INVOLUTION/CORTICAL LYMPHOCYTOSIS, Minimal.

Tissues without comment under Gross Observations were within normal limits at necropsy.
The following tissues were unremarkable microscopically:
Adrenal Glands Sternal Marrow Femoral Marrow Brain Sternum

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Propane: Combined Repeated-Exposure Toxicity,
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via Whole-Body Inhalation Exposures
Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice	SEX: Male	ANIMAL: 1010
PHASE DAY OF DEATH: 30	PHASE: Dosing phase	GROUP: 1

Tissue	Gross Observations/Comments	Microscopic Observations/Comments

Tissues without comment under Gross Observations were within normal limits at necropsy.
The following tissues were unremarkable microscopically:

Femur	Cecum	Colon	Duodenum	Epididymides
Ileum	Jejunum	Kidneys	Rectum/Low Colon	Cervical SC
Thoracic SC	Lumbar SC	Skin-protocol	Spleen	Stomach
Seminal vesicles	Testes	Trachea	Urinary bladder	

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Propane: Combined Repeated-Exposure Toxicity,
Reproduction and Neurotoxicity Screening in Rats
via Whole-Body Inhalation Exposures
Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice | SEX: Male | ANIMAL: 1011
PHASE DAY OF DEATH: 30 | PHASE: Dosing phase | GROUP: 1

Tissue	Gross Observations/Comments	Microscopic Observations/Comments
Kidneys	No gross observations on tissue.	CORTEX/CORTICO-MEDULLARY JUNCTION: TUBULE(S) DILATED, UNILATERAL, Focal, Slight. PELVIC DILATATION, UNILATERAL, Slight. CORTEX/CORTICO-MEDULLARY JUNCTION: MINERAL DEPOSIT(S), UNILATERAL, Minimal.
Mesenteric LN	No gross observations on tissue.	CORTICAL LYMPHOCYTES/UNIT AREA, Slight. PARACORTICAL LYMPHOCYTES/UNIT AREA, Moderate. FOLLICULAR GERMINAL CENTER DEVELOPMENT, Multifocal, Moderate. PROMINENT HISTIOCYTES, Multifocal, Minimal.
Mediastinal LN	No gross observations on tissue.	CORTICAL LYMPHOCYTES/UNIT AREA, Minimal. PARACORTICAL LYMPHOCYTES/UNIT AREA, Marked. FREE ERYTHROCYTES/ERYTHROPHAGOCYTOSIS, Multifocal, Minimal. PROMINENT HISTIOCYTES, Minimal. PROMINENT PLASMA CELLS, Multifocal, Minimal.

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Propane: Combined Repeated-Exposure Toxicity,
Reproduction and Neurotoxicity Screening in Rats
via Whole-Body Inhalation Exposures
Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice	SEX: Male	ANIMAL: 1011
PHASE DAY OF DEATH: 30	PHASE: Dosing phase	GROUP: 1

Tissue	Gross Observations/Comments	Microscopic Observations/Comments
Lungs	No gross observations on tissue.	ALVEOLAR/INTRAALVEOLAR MACROPHAGES, Multifocal, Minimal. VESSEL MINERALIZATION, Multifocal, Minimal.
Mammary-protocol	No gross observations on tissue.	MALE TYPE: (UNDIFFRENTIATED TYPE), Present.
Tibial Nerve	No gross observations on tissue.	Tissue is unremarkable (with comment). - TISSUE IS FRAGMENTED, BUT READABLE.
Parathyroid	No gross observations on tissue.	Tissue is missing. - TISSUE MISSING FROM SLIDE
Skin-protocol	No gross observations on tissue.	FOLLICULAR DILATATION/HAIR FOLLICLES: EMPTY/WITHOUT HAIRSHAFT, Multifocal, Minimal.
Testes	No gross observations on tissue.	SERTOLI CELL VACUOLATION, UNILATERAL, Focal, Minimal.
Thyroid	No gross observations on tissue.	Tissue is unremarkable; one-of-pair missing.
Thymus	No gross observations on tissue.	INVOLUTION/CORTICAL LYMPHOCYTOSIS, Minimal. HEMORRHAGE, Multifocal, Minimal.

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Propane: Combined Repeated-Exposure Toxicity,
Reproduction and Neurotoxicity Screening in Rats
via Whole-Body Inhalation Exposures
Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice | SEX: Male | ANIMAL: 1011
PHASE DAY OF DEATH: 30 | PHASE: Dosing phase | GROUP: 1

Tissue	Gross Observations/Comments	Microscopic Observations/Comments
Trachea	No gross observations on tissue.	SUBACUTE/CHRONIC INFLAMMATORY CELL INFILTRATE, Focal, Minimal.

Tissues without comment under Gross Observations were within normal limits at necropsy.
The following tissues were unremarkable microscopically:

Adrenal Glands	Sternal Marrow	Femoral Marrow	Brain	Sternum
Femur	Cecum	Colon	Duodenum	Epididymides
Heart	Ileum	Jejunum	Liver	Prostate
Rectum/Low Colon	Cervical SC	Thoracic SC	Lumbar SC	Spleen
Stomach	Seminal vesicles	Urinary bladder		

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Propane: Combined Repeated-Exposure Toxicity,
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via Whole-Body Inhalation Exposures
Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice | SEX: Male | ANIMAL: 1012
PHASE DAY OF DEATH: 30 | PHASE: Dosing phase | GROUP: 1

Tissue	Gross Observations/Comments	Microscopic Observations/Comments
Kidneys	No gross observations on tissue.	MEDULLA: MINERAL DEPOSIT(S), UNILATERAL, Focal, Minimal.
Mesenteric LN	No gross observations on tissue.	CORTICAL LYMPHOCYTES/UNIT AREA, Minimal. PARACORTICAL LYMPHOCYTES/UNIT AREA, Marked. FOLLICULAR GERMINAL CENTER DEVELOPMENT, Multifocal, Moderate. PROMINENT HISTIOCYTES, Multifocal, Slight.
Mediastinal LN	No gross observations on tissue.	CORTICAL LYMPHOCYTES/UNIT AREA, Minimal. PARACORTICAL LYMPHOCYTES/UNIT AREA, Moderate. FOLLICULAR GERMINAL CENTER DEVELOPMENT, Multifocal, Slight. FREE ERYTHROCYTES/ERYTHROPHAGOCYTOSIS, Multifocal, Minimal. PROMINENT HISTIOCYTES, Multifocal, Slight.
Lungs	No gross observations on tissue.	SUBACUTE/CHRONIC INFLAMMATORY CELL FOCI, Multifocal, Minimal. ALVEOLAR/INTRAALVEOLAR MACROPHAGES, Multifocal, Minimal. VESSEL MINERALIZATION, Multifocal, Minimal.

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Propane: Combined Repeated-Exposure Toxicity,
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via Whole-Body Inhalation Exposures
Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice | SEX: Male | ANIMAL: 1012
PHASE DAY OF DEATH: 30 | PHASE: Dosing phase | GROUP: 1

Tissue	Gross Observations/Comments	Microscopic Observations/Comments
Lungs		- LOBES ARE PARTIALLY ATELECTATIC.
Mammary-protocol	No gross observations on tissue.	MALE TYPE: (UNDIFFRENTIATED TYPE), Present.
Prostate	No gross observations on tissue.	INTERSTITIAL MONONUCLEAR CELL AGGREGATES, Multifocal, Minimal.
Parathyroid	No gross observations on tissue.	Tissue is missing. - TISSUE MISSING FROM SLIDE
Testes	No gross observations on tissue.	SERTOLI CELL VACUOLATION, UNILATERAL, Focal, Minimal.
Thyroid	No gross observations on tissue.	Tissue is unremarkable; one-of-pair missing.
Thymus	No gross observations on tissue.	INVOLUTION/CORTICAL LYMPHOCYTOSIS, Minimal. HEMORRHAGE, Focal, Minimal.

Tissues without comment under Gross Observations were within normal limits at necropsy.
The following tissues were unremarkable microscopically:
Adrenal Glands Sternal Marrow Femoral Marrow Brain Sternum

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Propane: Combined Repeated-Exposure Toxicity,
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Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice	SEX: Male	ANIMAL: 1012
PHASE DAY OF DEATH: 30	PHASE: Dosing phase	GROUP: 1

Tissue	Gross Observations/Comments	Microscopic Observations/Comments

Tissues without comment under Gross Observations were within normal limits at necropsy.
The following tissues were unremarkable microscopically:

Femur	Cecum	Colon	Duodenum	Epididymides
Heart	Ileum	Jejunum	Liver	Tibial Nerve
Rectum/Low Colon	Cervical SC	Thoracic SC	Lumbar SC	Skin-protocol
Spleen	Stomach	Seminal vesicles	Trachea	Urinary bladder

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Propane: Combined Repeated-Exposure Toxicity,
Reproduction and Neurotoxicity Screening in Rats
via Whole-Body Inhalation Exposures
Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice	SEX: Male	ANIMAL: 2001
PHASE DAY OF DEATH: 29	PHASE: Dosing phase	GROUP: 2

Tissue	Gross Observations/Comments	Microscopic Observations/Comments

Tissues without comment under Gross Observations were within normal limits at necropsy.
The following tissues were unremarkable microscopically:
No tissues examined.

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Propane: Combined Repeated-Exposure Toxicity,
Reproduction and Neurotoxicity Screening in Rats
via Whole-Body Inhalation Exposures
Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice	SEX: Male	ANIMAL: 2002
PHASE DAY OF DEATH: 29	PHASE: Dosing phase	GROUP: 2

Tissue	Gross Observations/Comments	Microscopic Observations/Comments

Tissues without comment under Gross Observations were within normal limits at necropsy.
The following tissues were unremarkable microscopically:
No tissues examined.

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Propane: Combined Repeated-Exposure Toxicity,
Reproduction and Neurotoxicity Screening in Rats
via Whole-Body Inhalation Exposures
Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice	SEX: Male	ANIMAL: 2003
PHASE DAY OF DEATH: 29	PHASE: Dosing phase	GROUP: 2

Tissue	Gross Observations/Comments	Microscopic Observations/Comments

Tissues without comment under Gross Observations were within normal limits at necropsy.
The following tissues were unremarkable microscopically:
No tissues examined.

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Propane: Combined Repeated-Exposure Toxicity,
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via Whole-Body Inhalation Exposures
Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice	SEX: Male	ANIMAL: 2004
PHASE DAY OF DEATH: 29	PHASE: Dosing phase	GROUP: 2

Tissue	Gross Observations/Comments	Microscopic Observations/Comments
Skin (other)	Scab, Cervical, Red, 0.2 - 0.5 cm	No micropathology observations on tissue.

Tissues without comment under Gross Observations were within normal limits at necropsy.
The following tissues were unremarkable microscopically:
No tissues examined.

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Propane: Combined Repeated-Exposure Toxicity,
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via Whole-Body Inhalation Exposures
Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice	SEX: Male	ANIMAL: 2005
PHASE DAY OF DEATH: 29	PHASE: Dosing phase	GROUP: 2

Tissue	Gross Observations/Comments	Microscopic Observations/Comments

Tissues without comment under Gross Observations were within normal limits at necropsy.
The following tissues were unremarkable microscopically:
No tissues examined.

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Propane: Combined Repeated-Exposure Toxicity,
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Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice	SEX: Male	ANIMAL: 2006
PHASE DAY OF DEATH: 29	PHASE: Dosing phase	GROUP: 2

Tissue	Gross Observations/Comments	Microscopic Observations/Comments

Tissues without comment under Gross Observations were within normal limits at necropsy.
The following tissues were unremarkable microscopically:
No tissues examined.

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Propane: Combined Repeated-Exposure Toxicity,
Reproduction and Neurotoxicity Screening in Rats
via Whole-Body Inhalation Exposures
Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice	SEX: Male	ANIMAL: 2007
PHASE DAY OF DEATH: 30	PHASE: Dosing phase	GROUP: 2

Tissue	Gross Observations/Comments	Microscopic Observations/Comments

Tissues without comment under Gross Observations were within normal limits at necropsy.
The following tissues were unremarkable microscopically:
No tissues examined.

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Propane: Combined Repeated-Exposure Toxicity,
Reproduction and Neurotoxicity Screening in Rats
via Whole-Body Inhalation Exposures
Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice	SEX: Male	ANIMAL: 2008
PHASE DAY OF DEATH: 30	PHASE: Dosing phase	GROUP: 2

Tissue	Gross Observations/Comments	Microscopic Observations/Comments

Tissues without comment under Gross Observations were within normal limits at necropsy.
The following tissues were unremarkable microscopically:
No tissues examined.

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Propane: Combined Repeated-Exposure Toxicity,
Reproduction and Neurotoxicity Screening in Rats
via Whole-Body Inhalation Exposures
Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice	SEX: Male	ANIMAL: 2009
PHASE DAY OF DEATH: 30	PHASE: Dosing phase	GROUP: 2

Tissue	Gross Observations/Comments	Microscopic Observations/Comments

Tissues without comment under Gross Observations were within normal limits at necropsy.
The following tissues were unremarkable microscopically:
No tissues examined.

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Propane: Combined Repeated-Exposure Toxicity,
Reproduction and Neurotoxicity Screening in Rats
via Whole-Body Inhalation Exposures
Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice	SEX: Male	ANIMAL: 2010
PHASE DAY OF DEATH: 30	PHASE: Dosing phase	GROUP: 2

Tissue	Gross Observations/Comments	Microscopic Observations/Comments

Tissues without comment under Gross Observations were within normal limits at necropsy.
The following tissues were unremarkable microscopically:
No tissues examined.

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Propane: Combined Repeated-Exposure Toxicity,
Reproduction and Neurotoxicity Screening in Rats
via Whole-Body Inhalation Exposures
Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice	SEX: Male	ANIMAL: 2011
PHASE DAY OF DEATH: 30	PHASE: Dosing phase	GROUP: 2

Tissue	Gross Observations/Comments	Microscopic Observations/Comments

Tissues without comment under Gross Observations were within normal limits at necropsy.
The following tissues were unremarkable microscopically:
No tissues examined.

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Propane: Combined Repeated-Exposure Toxicity,
Reproduction and Neurotoxicity Screening in Rats
via Whole-Body Inhalation Exposures
Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice	SEX: Male	ANIMAL: 2012
PHASE DAY OF DEATH: 30	PHASE: Dosing phase	GROUP: 2

Tissue	Gross Observations/Comments	Microscopic Observations/Comments

Tissues without comment under Gross Observations were within normal limits at necropsy.
The following tissues were unremarkable microscopically:
No tissues examined.

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Propane: Combined Repeated-Exposure Toxicity,
Reproduction and Neurotoxicity Screening in Rats
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Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice	SEX: Male	ANIMAL: 3001
PHASE DAY OF DEATH: 29	PHASE: Dosing phase	GROUP: 3

Tissue	Gross Observations/Comments	Microscopic Observations/Comments

Tissues without comment under Gross Observations were within normal limits at necropsy.
The following tissues were unremarkable microscopically:
No tissues examined.

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Propane: Combined Repeated-Exposure Toxicity,
Reproduction and Neurotoxicity Screening in Rats
via Whole-Body Inhalation Exposures
Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice	SEX: Male	ANIMAL: 3002
PHASE DAY OF DEATH: 29	PHASE: Dosing phase	GROUP: 3

Tissue	Gross Observations/Comments	Microscopic Observations/Comments
Skin (other)	Hair Thin/Absent, Forelegs, Slight	No micropathology observations on tissue.

Tissues without comment under Gross Observations were within normal limits at necropsy.
The following tissues were unremarkable microscopically:
No tissues examined.

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Propane: Combined Repeated-Exposure Toxicity,
Reproduction and Neurotoxicity Screening in Rats
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Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice	SEX: Male	ANIMAL: 3003
PHASE DAY OF DEATH: 29	PHASE: Dosing phase	GROUP: 3

Tissue	Gross Observations/Comments	Microscopic Observations/Comments

Tissues without comment under Gross Observations were within normal limits at necropsy.
The following tissues were unremarkable microscopically:
No tissues examined.

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Propane: Combined Repeated-Exposure Toxicity,
Reproduction and Neurotoxicity Screening in Rats
via Whole-Body Inhalation Exposures
Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice	SEX: Male	ANIMAL: 3004
PHASE DAY OF DEATH: 29	PHASE: Dosing phase	GROUP: 3

Tissue	Gross Observations/Comments	Microscopic Observations/Comments

Tissues without comment under Gross Observations were within normal limits at necropsy.
The following tissues were unremarkable microscopically:
No tissues examined.

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Propane: Combined Repeated-Exposure Toxicity,
Reproduction and Neurotoxicity Screening in Rats
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Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice	SEX: Male	ANIMAL: 3005
PHASE DAY OF DEATH: 29	PHASE: Dosing phase	GROUP: 3

Tissue	Gross Observations/Comments	Microscopic Observations/Comments

Tissues without comment under Gross Observations were within normal limits at necropsy.
The following tissues were unremarkable microscopically:
No tissues examined.

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Propane: Combined Repeated-Exposure Toxicity,
Reproduction and Neurotoxicity Screening in Rats
via Whole-Body Inhalation Exposures
Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice	SEX: Male	ANIMAL: 3006
PHASE DAY OF DEATH: 29	PHASE: Dosing phase	GROUP: 3

Tissue	Gross Observations/Comments	Microscopic Observations/Comments

Tissues without comment under Gross Observations were within normal limits at necropsy.
The following tissues were unremarkable microscopically:
No tissues examined.

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Propane: Combined Repeated-Exposure Toxicity,
Reproduction and Neurotoxicity Screening in Rats
via Whole-Body Inhalation Exposures
Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice	SEX: Male	ANIMAL: 3007
PHASE DAY OF DEATH: 30	PHASE: Dosing phase	GROUP: 3

Tissue	Gross Observations/Comments	Microscopic Observations/Comments

Tissues without comment under Gross Observations were within normal limits at necropsy.
The following tissues were unremarkable microscopically:
No tissues examined.

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Propane: Combined Repeated-Exposure Toxicity,
Reproduction and Neurotoxicity Screening in Rats
via Whole-Body Inhalation Exposures
Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice	SEX: Male	ANIMAL: 3008
PHASE DAY OF DEATH: 30	PHASE: Dosing phase	GROUP: 3

Tissue	Gross Observations/Comments	Microscopic Observations/Comments

Tissues without comment under Gross Observations were within normal limits at necropsy.
The following tissues were unremarkable microscopically:
No tissues examined.

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Propane: Combined Repeated-Exposure Toxicity,
Reproduction and Neurotoxicity Screening in Rats
via Whole-Body Inhalation Exposures
Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice	SEX: Male	ANIMAL: 3009
PHASE DAY OF DEATH: 30	PHASE: Dosing phase	GROUP: 3

Tissue	Gross Observations/Comments	Microscopic Observations/Comments

Tissues without comment under Gross Observations were within normal limits at necropsy.
The following tissues were unremarkable microscopically:
No tissues examined.

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Propane: Combined Repeated-Exposure Toxicity,
Reproduction and Neurotoxicity Screening in Rats
via Whole-Body Inhalation Exposures
Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice	SEX: Male	ANIMAL: 3010
PHASE DAY OF DEATH: 30	PHASE: Dosing phase	GROUP: 3

Tissue	Gross Observations/Comments	Microscopic Observations/Comments

Tissues without comment under Gross Observations were within normal limits at necropsy.
The following tissues were unremarkable microscopically:
No tissues examined.

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Propane: Combined Repeated-Exposure Toxicity,
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Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice	SEX: Male	ANIMAL: 3011
PHASE DAY OF DEATH: 30	PHASE: Dosing phase	GROUP: 3

Tissue	Gross Observations/Comments	Microscopic Observations/Comments

Tissues without comment under Gross Observations were within normal limits at necropsy.
The following tissues were unremarkable microscopically:
No tissues examined.

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Propane: Combined Repeated-Exposure Toxicity,
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Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice	SEX: Male	ANIMAL: 3012
PHASE DAY OF DEATH: 30	PHASE: Dosing phase	GROUP: 3

Tissue	Gross Observations/Comments	Microscopic Observations/Comments

Tissues without comment under Gross Observations were within normal limits at necropsy.
The following tissues were unremarkable microscopically:
No tissues examined.

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Propane: Combined Repeated-Exposure Toxicity,
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Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice | SEX: Male | ANIMAL: 4001
PHASE DAY OF DEATH: 29 | PHASE: Dosing phase | GROUP: 4

Tissue	Gross Observations/Comments	Microscopic Observations/Comments
Epididymides	No gross observations on tissue.	MONONUCLEAR CELL AGGREGATES, UNILATERAL, Multifocal, Minimal.
Liver	No gross observations on tissue.	SUBACUTE/CHRONIC INFLAMMATORY CELL FOCI, Multifocal, Minimal.
Mesenteric LN	No gross observations on tissue.	CORTICAL LYMPHOCYTES/UNIT AREA, Slight. PARACORTICAL LYMPHOCYTES/UNIT AREA, Moderate. FOLLICULAR GERMINAL CENTER DEVELOPMENT, Multifocal, Moderate. FREE ERYTHROCYTES/ERYTHROPHAGOCYTOSIS, Minimal. PROMINENT HISTIOCYTES, Multifocal, Minimal. PROMINENT PLASMA CELLS, Multifocal, Slight.
Mediastinal LN	No gross observations on tissue.	PARACORTICAL LYMPHOCYTES/UNIT AREA, Marked. FOLLICULAR GERMINAL CENTER DEVELOPMENT, Multifocal, Moderate. FREE ERYTHROCYTES/ERYTHROPHAGOCYTOSIS, Minimal. PROMINENT PLASMA CELLS, Multifocal, Moderate.

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Propane: Combined Repeated-Exposure Toxicity,
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via Whole-Body Inhalation Exposures
Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice	SEX: Male	ANIMAL: 4001
PHASE DAY OF DEATH: 29	PHASE: Dosing phase	GROUP: 4

Tissue	Gross Observations/Comments	Microscopic Observations/Comments
Lungs	No gross observations on tissue.	PERIALVEOLAR/PERIVASCULAR SUBACUTE/CHRONIC INFLAMMATORY CELL INFILTRATE, Multifocal, Minimal. ALVEOLAR/INTRAALVEOLAR MACROPHAGES, Minimal. VESSEL MINERALIZATION, Multifocal, Minimal. - LOBES ARE PARTIALLY ATELECTATIC.
Mammary-protocol	No gross observations on tissue.	MALE TYPE: (UNDIFFRENTIATED TYPE), Present.
Tibial Nerve	No gross observations on tissue.	Tissue is unremarkable (with comment). - SMALL TISSUE SPECIMEN. RECUT: NO IMPROVEMENT.
Parathyroid	No gross observations on tissue.	No micropathology observations on tissue; one-of-pair missing.
Thyroid	No gross observations on tissue.	ULTIMOBRANCHIAL REST(S), BILATERAL, Multifocal, Minimal.
Thymus	No gross observations on tissue.	INVOLUTION/CORTICAL LYMPHOCYTOSIS, Minimal. HEMORRHAGE, Focal, Minimal.

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Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice	SEX: Male	ANIMAL: 4001
PHASE DAY OF DEATH: 29	PHASE: Dosing phase	GROUP: 4

Tissue	Gross Observations/Comments	Microscopic Observations/Comments

Tissues without comment under Gross Observations were within normal limits at necropsy.
The following tissues were unremarkable microscopically:

Adrenal Glands	Sternal Marrow	Femoral Marrow	Brain	Sternum
Femur	Cecum	Colon	Duodenum	Heart
Ileum	Jejunum	Kidneys	Prostate	Rectum/Low Colon
Cervical SC	Thoracic SC	Lumbar SC	Skin-protocol	Spleen
Stomach	Seminal vesicles	Testes	Trachea	Urinary bladder

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Propane: Combined Repeated-Exposure Toxicity,
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Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice | SEX: Male | ANIMAL: 4002
PHASE DAY OF DEATH: 29 | PHASE: Dosing phase | GROUP: 4

Tissue	Gross Observations/Comments	Microscopic Observations/Comments
Liver	No gross observations on tissue.	SUBACUTE/CHRONIC INFLAMMATORY CELL FOCI, Multifocal, Minimal.
Mesenteric LN	No gross observations on tissue.	CORTICAL LYMPHOCYTES/UNIT AREA, Moderate. PARACORTICAL LYMPHOCYTES/UNIT AREA, Moderate. FOLLICULAR GERMINAL CENTER DEVELOPMENT, Moderate. PROMINENT PLASMA CELLS, Multifocal, Minimal.
Mediastinal LN	No gross observations on tissue.	CORTICAL LYMPHOCYTES/UNIT AREA, Minimal. PARACORTICAL LYMPHOCYTES/UNIT AREA, Slight. FOLLICULAR GERMINAL CENTER DEVELOPMENT, Multifocal, Moderate. PROMINENT PLASMA CELLS, Slight.
Lungs	No gross observations on tissue.	PERIALVEOLAR/PERIVASCULAR SUBACUTE/CHRONIC INFLAMMATORY CELL INFILTRATE, Multifocal, Minimal. SUBACUTE/CHRONIC INFLAMMATORY CELL FOCI, Multifocal, Minimal.

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Reproduction and Neurotoxicity Screening in Rats
via Whole-Body Inhalation Exposures
Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice | SEX: Male | ANIMAL: 4002
PHASE DAY OF DEATH: 29 | PHASE: Dosing phase | GROUP: 4

Tissue	Gross Observations/Comments	Microscopic Observations/Comments
Mammary-protocol	No gross observations on tissue.	MALE TYPE: (UNDIFFRENTIATED TYPE), Present.
Parathyroid	No gross observations on tissue.	Tissue is missing. - TISSUE MISSING FROM SLIDE
Thymus	No gross observations on tissue.	INVOLUTION/CORTICAL LYMPHOCYTOSIS, Minimal. HEMORRHAGE, Focal, Minimal. LYMPHOCYTIC HYPERPLASIA, Focal, Slight.

Tissues without comment under Gross Observations were within normal limits at necropsy.
The following tissues were unremarkable microscopically:

Adrenal Glands	Sternal Marrow	Femoral Marrow	Brain	Sternum
Femur	Cecum	Colon	Duodenum	Epididymides
Heart	Ileum	Jejunum	Kidneys	Tibial Nerve
Prostate	Rectum/Low Colon	Cervical SC	Thoracic SC	Lumbar SC
Skin-protocol	Spleen	Stomach	Seminal vesicles	Testes
Thyroid	Trachea	Urinary bladder		

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Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice	SEX: Male	ANIMAL: 4003
PHASE DAY OF DEATH: 29	PHASE: Dosing phase	GROUP: 4

Tissue	Gross Observations/Comments	Microscopic Observations/Comments
Epididymides	No gross observations on tissue.	MONONUCLEAR CELL AGGREGATES, UNILATERAL, Multifocal, Minimal.
Kidneys	No gross observations on tissue.	MEDULLA: MINERAL DEPOSIT(S), UNILATERAL, Multifocal, Minimal.
Liver	No gross observations on tissue.	SUBACUTE/CHRONIC INFLAMMATORY CELL FOCI, Focal, Minimal.
Mesenteric LN	No gross observations on tissue.	CORTICAL LYMPHOCYTES/UNIT AREA, Slight. PARACORTICAL LYMPHOCYTES/UNIT AREA, Marked. FOLLICULAR GERMINAL CENTER DEVELOPMENT, Multifocal, Slight.
Mediastinal LN	No gross observations on tissue.	CORTICAL LYMPHOCYTES/UNIT AREA, Minimal. PARACORTICAL LYMPHOCYTES/UNIT AREA, Moderate. FOLLICULAR GERMINAL CENTER DEVELOPMENT, Multifocal, Slight. FREE ERYTHROCYTES/ERYTHROPHAGOCYTOSIS, Multifocal, Minimal. PROMINENT HISTIOCYTES, Multifocal, Minimal. - ADDITIONAL NODAL TISSUE ON SLIDE #17

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Propane: Combined Repeated-Exposure Toxicity,
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Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice | SEX: Male | ANIMAL: 4003
PHASE DAY OF DEATH: 29 | PHASE: Dosing phase | GROUP: 4

Tissue	Gross Observations/Comments	Microscopic Observations/Comments
		(thymus).
Lungs	No gross observations on tissue.	PERIALVEOLAR/PERIVASCULAR SUBACUTE/CHRONIC INFLAMMATORY CELL INFILTRATE, Multifocal, Minimal. SUBACUTE/CHRONIC INFLAMMATORY CELL FOCI, Multifocal, Minimal. ALVEOLAR/INTRAALVEOLAR MACROPHAGES, Multifocal, Minimal. - LOBES ARE PARTIALLY ATELECTATIC.
Mammary-protocol	No gross observations on tissue.	MALE TYPE: (UNDIFFRENTIATED TYPE), Present.
Parathyroid	No gross observations on tissue.	Tissue is unremarkable; one-of-pair missing.
Thymus	No gross observations on tissue.	INVOLUTION/CORTICAL LYMPHOCYTOSIS, Minimal. HEMORRHAGE, Multifocal, Minimal.

Tissues without comment under Gross Observations were within normal limits at necropsy.
The following tissues were unremarkable microscopically:
Adrenal Glands Sternal Marrow Femoral Marrow Brain Sternum

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Propane: Combined Repeated-Exposure Toxicity,
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STATUS: Final phase sacrifice	SEX: Male	ANIMAL: 4003
PHASE DAY OF DEATH: 29	PHASE: Dosing phase	GROUP: 4

Tissue	Gross Observations/Comments	Microscopic Observations/Comments

Tissues without comment under Gross Observations were within normal limits at necropsy.
The following tissues were unremarkable microscopically:

Femur	Cecum	Colon	Duodenum	Heart
Ileum	Jejunum	Tibial Nerve	Prostate	Rectum/Low Colon
Cervical SC	Thoracic SC	Lumbar SC	Skin-protocol	Spleen
Stomach	Seminal vesicles	Testes	Thyroid	Trachea
Urinary bladder				

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STATUS: Final phase sacrifice | SEX: Male | ANIMAL: 4004
PHASE DAY OF DEATH: 29 | PHASE: Dosing phase | GROUP: 4

Tissue	Gross Observations/Comments	Microscopic Observations/Comments
Femur	No gross observations on tissue.	EPIPHYSEAL SUBCHONDRAL CYST(S), Focal, Minimal.
Heart	No gross observations on tissue.	SUBACUTE/CHRONIC INFLAMMATORY CELL INFILTRATE, Multifocal, Minimal. - TISSUE IS FRAGMENTED, BUT READABLE.
Kidneys	No gross observations on tissue.	INTERSTITIAL MONONUCLEAR CELL AGGREGATES, UNILATERAL, Multifocal, Minimal.
Mesenteric LN	No gross observations on tissue.	CORTICAL LYMPHOCYTES/UNIT AREA, Slight. PARACORTICAL LYMPHOCYTES/UNIT AREA, Moderate. FOLLICULAR GERMINAL CENTER DEVELOPMENT, Multifocal, Moderate. PROMINENT HISTIOCYTES, Multifocal, Minimal. PROMINENT PLASMA CELLS, Multifocal, Minimal.
Mediastinal LN	No gross observations on tissue.	CORTICAL LYMPHOCYTES/UNIT AREA, Slight. PARACORTICAL LYMPHOCYTES/UNIT AREA, Moderate. FOLLICULAR GERMINAL CENTER DEVELOPMENT, Multifocal, Moderate.

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STATUS: Final phase sacrifice | SEX: Male | ANIMAL: 4004
PHASE DAY OF DEATH: 29 | PHASE: Dosing phase | GROUP: 4

Tissue	Gross Observations/Comments	Microscopic Observations/Comments
Mediastinal LN		FREE ERYTHROCYTES/ERYTHROPHAGOCYTOSIS, Multifocal, Minimal. PROMINENT PLASMA CELLS, Multifocal, Slight.
Lungs	No gross observations on tissue.	ALVEOLAR/INTRAALVEOLAR MACROPHAGES, Multifocal, Minimal. VESSEL MINERALIZATION, Multifocal, Minimal. - LOBES ARE PARTIALLY ATELECTATIC.
Mammary-protocol . . .	No gross observations on tissue.	MALE TYPE: (UNDIFFRENTIATED TYPE), Present.
Parathyroid	No gross observations on tissue.	Tissue is unremarkable; one-of-pair missing.
Skin-protocol	No gross observations on tissue.	FOLLICULAR DILATATION/HAIR FOLLICLES: EMPTY/WITHOUT HAIRSHAFT, Multifocal, Minimal.
Testes	No gross observations on tissue.	SERTOLI CELL VACUOLATION, UNILATERAL, Focal, Minimal.
Thymus	No gross observations on tissue.	INVOLUTION/CORTICAL LYMPHOCYTOSIS, Minimal.

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STATUS: Final phase sacrifice	SEX: Male	ANIMAL: 4004
PHASE DAY OF DEATH: 29	PHASE: Dosing phase	GROUP: 4

Tissue	Gross Observations/Comments	Microscopic Observations/Comments

Tissues without comment under Gross Observations were within normal limits at necropsy.
The following tissues were unremarkable microscopically:

Adrenal Glands	Sternal Marrow	Femoral Marrow	Brain	Sternum
Cecum	Colon	Duodenum	Epididymides	Ileum
Jejunum	Liver	Tibial Nerve	Prostate	Rectum/Low Colon
Cervical SC	Thoracic SC	Lumbar SC	Spleen	Stomach
Seminal vesicles	Thyroid	Trachea	Urinary bladder	

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STATUS: Final phase sacrifice | SEX: Male | ANIMAL: 4005
PHASE DAY OF DEATH: 29 | PHASE: Dosing phase | GROUP: 4

Tissue	Gross Observations/Comments	Microscopic Observations/Comments
Adrenal Glands	No gross observations on tissue.	Tissue is unremarkable (with comment). - ONLY ONE MEDULLA PRESENT. RECUT: NO IMPROVEMENT.
Kidneys	No gross observations on tissue.	PELVIC DILATATION, BILATERAL, Moderate.
Liver	No gross observations on tissue.	SUBACUTE/CHRONIC INFLAMMATORY CELL FOCI, Multifocal, Minimal.
Mesenteric LN	No gross observations on tissue.	CORTICAL LYMPHOCYTES/UNIT AREA, Minimal. PARACORTICAL LYMPHOCYTES/UNIT AREA, Severe. FOLLICULAR GERMINAL CENTER DEVELOPMENT, Multifocal, Moderate. PROMINENT HISTIOCYTES, Multifocal, Minimal. PROMINENT PLASMA CELLS, Multifocal, Minimal.
Mediastinal LN	No gross observations on tissue.	CORTICAL LYMPHOCYTES/UNIT AREA, Minimal. PARACORTICAL LYMPHOCYTES/UNIT AREA, Marked. FREE ERYTHROCYTES/ERYTHROPHAGOCYTOSIS, Multifocal, Slight.
Lungs	No gross observations on tissue.	PERIALVEOLAR/PERIVASCULAR SUBACUTE/CHRONIC INFLAMMATORY CELL INFILTRATE, Multifocal, Minimal.

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Propane: Combined Repeated-Exposure Toxicity,
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Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice | SEX: Male | ANIMAL: 4005
PHASE DAY OF DEATH: 29 | PHASE: Dosing phase | GROUP: 4

Tissue	Gross Observations/Comments	Microscopic Observations/Comments
Lungs		SUBACUTE/CHRONIC INFLAMMATORY CELL FOCI, Multifocal, Minimal. ALVEOLAR/INTRAALVEOLAR MACROPHAGES, Multifocal, Minimal.
Mammary-protocol	No gross observations on tissue.	MALE TYPE: (UNDIFFRENTIATED TYPE), Present.
Parathyroid	No gross observations on tissue.	Tissue is missing.
Skin-protocol	No gross observations on tissue.	FOLLICULAR DILATATION/HAIR FOLLICLES: EMPTY/WITHOUT HAIRSHAFT, Multifocal, Minimal.
Thymus	No gross observations on tissue.	INVOLUTION/CORTICAL LYMPHOCYTOSIS, Minimal. HEMORRHAGE, Multifocal, Minimal.

Tissues without comment under Gross Observations were within normal limits at necropsy.
The following tissues were unremarkable microscopically:

Sternal Marrow	Femoral Marrow	Brain	Sternum	Femur
Cecum	Colon	Duodenum	Epididymides	Heart
Ileum	Jejunum	Tibial Nerve	Prostate	Rectum/Low Colon

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STATUS: Final phase sacrifice	SEX: Male	ANIMAL: 4005
PHASE DAY OF DEATH: 29	PHASE: Dosing phase	GROUP: 4

Tissue	Gross Observations/Comments	Microscopic Observations/Comments
Cervical SC	Thoracic SC	Lumbar SC
Seminal vesicles	Testes	Thyroid
Spleen	Stomach	
Trachea	Urinary bladder	

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Propane: Combined Repeated-Exposure Toxicity,
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Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice	SEX: Male	ANIMAL: 4006
PHASE DAY OF DEATH: 29	PHASE: Dosing phase	GROUP: 4

Tissue	Gross Observations/Comments	Microscopic Observations/Comments
Epididymides	No gross observations on tissue.	MONONUCLEAR CELL AGGREGATES, UNILATERAL, Focal, Minimal.
Heart	No gross observations on tissue.	SUBACUTE/CHRONIC INFLAMMATORY CELL INFILTRATE, Slight.
Kidneys	No gross observations on tissue.	CORTEX: CONVOLUTED TUBULAR EPITHELIUM-BASOPHILIC, UNILATERAL, Focal, Minimal.
Mesenteric LN	No gross observations on tissue.	CORTICAL LYMPHOCYTES/UNIT AREA, Moderate. PARACORTICAL LYMPHOCYTES/UNIT AREA, Marked. FOLLICULAR GERMINAL CENTER DEVELOPMENT, Moderate. FREE ERYTHROCYTES/ERYTHROPHAGOCYTOSIS, Minimal. PROMINENT HISTIOCYTES, Multifocal, Slight.
Mediastinal LN	No gross observations on tissue.	CORTICAL LYMPHOCYTES/UNIT AREA, Minimal. PARACORTICAL LYMPHOCYTES/UNIT AREA, Moderate.
Lungs	No gross observations on tissue.	PERIALVEOLAR/PERIVASCULAR SUBACUTE/CHRONIC INFLAMMATORY CELL INFILTRATE, Multifocal, Minimal.

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Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice | SEX: Male | ANIMAL: 4006
PHASE DAY OF DEATH: 29 | PHASE: Dosing phase | GROUP: 4

Tissue	Gross Observations/Comments	Microscopic Observations/Comments
Lungs		SUBACUTE/CHRONIC INFLAMMATORY CELL FOCI, Multifocal, Minimal. ALVEOLAR/INTRAALVEOLAR MACROPHAGES, Multifocal, Minimal. - LOBES ARE PARTIALLY ATELECTATIC.
Mammary-protocol	No gross observations on tissue.	MALE TYPE: (UNDIFFRENTIATED TYPE), Present.
Parathyroid	No gross observations on tissue.	Tissue is missing.
Cervical SC	No gross observations on tissue.	Tissue is unremarkable (with comment). - TISSUE IS FRAGMENTED, BUT READABLE. RECUT: NO IMPROVEMENT.
Thoracic SC	No gross observations on tissue.	Tissue is unremarkable (with comment). - TISSUE IS FRAGMENTED, BUT READABLE. RECUT: NO IMPROVEMENT.
Lumbar SC	No gross observations on tissue.	Tissue is unremarkable (with comment). - TISSUE IS FRAGMENTED, BUT READABLE.
Testes	No gross observations on tissue.	GERM CELL DEGENERATION/MULTINUCLEATE CELLS, UNILATERAL, Minimal.
Thymus	No gross observations on tissue.	INVOLUTION/CORTICAL LYMPHOCYTOSIS, Minimal.

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STATUS: Final phase sacrifice	SEX: Male	ANIMAL: 4006
PHASE DAY OF DEATH: 29	PHASE: Dosing phase	GROUP: 4

Tissue	Gross Observations/Comments	Microscopic Observations/Comments

Tissues without comment under Gross Observations were within normal limits at necropsy.
The following tissues were unremarkable microscopically:

Adrenal Glands	Sternal Marrow	Femoral Marrow	Brain	Sternum
Femur	Cecum	Colon	Duodenum	Ileum
Jejunum	Liver	Tibial Nerve	Prostate	Rectum/Low Colon
Skin-protocol	Spleen	Stomach	Seminal vesicles	Thyroid
Trachea	Urinary bladder			

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STATUS: Final phase sacrifice | SEX: Male | ANIMAL: 4007
PHASE DAY OF DEATH: 30 | PHASE: Dosing phase | GROUP: 4

Tissue	Gross Observations/Comments	Microscopic Observations/Comments
Kidneys	No gross observations on tissue.	PELVIC DILATATION, UNILATERAL, Minimal.
Liver	No gross observations on tissue.	SUBACUTE/CHRONIC INFLAMMATORY CELL FOCI, Multifocal, Minimal.
Mesenteric LN	No gross observations on tissue.	CORTICAL LYMPHOCYTES/UNIT AREA, Moderate. PARACORTICAL LYMPHOCYTES/UNIT AREA, Marked. FOLLICULAR GERMINAL CENTER DEVELOPMENT, Multifocal, Moderate. PROMINENT HISTIOCYTES, Multifocal, Minimal. PROMINENT PLASMA CELLS, Multifocal, Minimal.
Mediastinal LN	No gross observations on tissue.	CORTICAL LYMPHOCYTES/UNIT AREA, Minimal. PARACORTICAL LYMPHOCYTES/UNIT AREA, Marked. FOLLICULAR GERMINAL CENTER DEVELOPMENT, Multifocal, Slight. FREE ERYTHROCYTES/ERYTHROPHAGOCYTOSIS, Multifocal, Slight. PROMINENT HISTIOCYTES, Multifocal, Minimal.
Lungs	No gross observations on tissue.	PERIALVEOLAR/PERIVASCULAR SUBACUTE/CHRONIC INFLAMMATORY CELL INFILTRATE, Multifocal, Minimal.

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Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice | SEX: Male | ANIMAL: 4007
PHASE DAY OF DEATH: 30 | PHASE: Dosing phase | GROUP: 4

Tissue	Gross Observations/Comments	Microscopic Observations/Comments
Lungs		ALVEOLAR/INTRAALVEOLAR MACROPHAGES, Multifocal, Minimal. VESSEL MINERALIZATION, Multifocal, Minimal. - LOBES ARE PARTIALLY ATELECTATIC.
Mammary-protocol	No gross observations on tissue.	MALE TYPE: (UNDIFFRENTIATED TYPE), Present.
Parathyroid	No gross observations on tissue.	Tissue is missing.
Skin-protocol	No gross observations on tissue.	FOLLICULAR DILATATION/HAIR FOLLICLES: EMPTY/WITHOUT HAIRSHAFT, Multifocal, Minimal.
Thymus	No gross observations on tissue.	HEMORRHAGE, Focal, Minimal.

Tissues without comment under Gross Observations were within normal limits at necropsy.
The following tissues were unremarkable microscopically:

Adrenal Glands	Sternal Marrow	Femoral Marrow	Brain	Sternum
Femur	Cecum	Colon	Duodenum	Epididymides
Heart	Ileum	Jejunum	Tibial Nerve	Prostate
Rectum/Low Colon	Cervical SC	Thoracic SC	Lumbar SC	Spleen

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STATUS: Final phase sacrifice	SEX: Male	ANIMAL: 4007
PHASE DAY OF DEATH: 30	PHASE: Dosing phase	GROUP: 4

Tissue	Gross Observations/Comments	Microscopic Observations/Comments
Stomach	Seminal vesicles	Testes
Thyroid	Trachea	
Urinary bladder		

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STATUS: Final phase sacrifice	SEX: Male	ANIMAL: 4008
PHASE DAY OF DEATH: 30	PHASE: Dosing phase	GROUP: 4

Tissue	Gross Observations/Comments	Microscopic Observations/Comments
Kidneys	No gross observations on tissue.	TUBULAR EOSINOPHILIC CASTS, UNILATERAL, Focal, Minimal. CORTEX: CONVOLUTED TUBULAR EPITHELIUM-BASOPHILIC, UNILATERAL, Focal, Minimal. CORTEX/CORTICO-MEDULLARY JUNCTION: TUBULE(S) DILATED, UNILATERAL, Focal, Minimal. PELVIC DILATATION, UNILATERAL, Slight.
Mesenteric LN	No gross observations on tissue.	CORTICAL LYMPHOCYTES/UNIT AREA, Multifocal, Minimal. PARACORTICAL LYMPHOCYTES/UNIT AREA, Moderate. FOLLICULAR GERMINAL CENTER DEVELOPMENT, Multifocal, Moderate. PROMINENT HISTIOCYTES, Multifocal, Minimal.
Mediastinal LN	No gross observations on tissue.	CORTICAL LYMPHOCYTES/UNIT AREA, Minimal. PARACORTICAL LYMPHOCYTES/UNIT AREA, Marked. FREE ERYTHROCYTES/ERYTHROPHAGOCYTOSIS, Multifocal, Minimal. PROMINENT HISTIOCYTES, Multifocal, Minimal.

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Propane: Combined Repeated-Exposure Toxicity,
Reproduction and Neurotoxicity Screening in Rats
via Whole-Body Inhalation Exposures
Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice | SEX: Male | ANIMAL: 4008
PHASE DAY OF DEATH: 30 | PHASE: Dosing phase | GROUP: 4

Tissue	Gross Observations/Comments	Microscopic Observations/Comments
Lungs	No gross observations on tissue.	ALVEOLAR/INTRAALVEOLAR MACROPHAGES, Multifocal, Minimal. VESSEL MINERALIZATION, Multifocal, Minimal. - LOBES ARE PARTIALLY ATELECTATIC.
Mammary-protocol	No gross observations on tissue.	MALE TYPE: (UNDIFFRENTIATED TYPE), Present.
Prostate	No gross observations on tissue.	INTERSTITIAL MONONUCLEAR CELL AGGREGATES, Multifocal, Slight.
Parathyroid	No gross observations on tissue.	Tissue is missing.
Thyroid	No gross observations on tissue.	Tissue is unremarkable; one-of-pair missing.
Thymus	No gross observations on tissue.	INVOLUTION/CORTICAL LYMPHOCYTOSIS, Minimal. HEMORRHAGE, Multifocal, Minimal.

Tissues without comment under Gross Observations were within normal limits at necropsy.
The following tissues were unremarkable microscopically:
Adrenal Glands Sternal Marrow Femoral Marrow Brain Sternum

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Propane: Combined Repeated-Exposure Toxicity,
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via Whole-Body Inhalation Exposures
Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice	SEX: Male	ANIMAL: 4008
PHASE DAY OF DEATH: 30	PHASE: Dosing phase	GROUP: 4

Tissue	Gross Observations/Comments	Microscopic Observations/Comments

Tissues without comment under Gross Observations were within normal limits at necropsy.
The following tissues were unremarkable microscopically:

Femur	Cecum	Colon	Duodenum	Epididymides
Heart	Ileum	Jejunum	Liver	Tibial Nerve
Rectum/Low Colon	Cervical SC	Thoracic SC	Lumbar SC	Skin-protocol
Spleen	Stomach	Seminal vesicles	Testes	Trachea
Urinary bladder				

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Propane: Combined Repeated-Exposure Toxicity,
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Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice | SEX: Male | ANIMAL: 4009
PHASE DAY OF DEATH: 30 | PHASE: Dosing phase | GROUP: 4

Tissue	Gross Observations/Comments	Microscopic Observations/Comments
Heart	No gross observations on tissue.	SUBACUTE/CHRONIC INFLAMMATORY CELL INFILTRATE, Multifocal, Minimal.
Kidneys	No gross observations on tissue.	CORTEX/CORTICO-MEDULLARY JUNCTION: TUBULE(S) DILATED, UNILATERAL, Focal, Slight. PELVIC DILATATION, UNILATERAL, Slight.
Mesenteric LN	No gross observations on tissue.	CORTICAL LYMPHOCYTES/UNIT AREA, Moderate. PARACORTICAL LYMPHOCYTES/UNIT AREA, Marked. FOLLICULAR GERMINAL CENTER DEVELOPMENT, Multifocal, Moderate. PROMINENT HISTIOCYTES, Multifocal, Minimal.
Mediastinal LN	No gross observations on tissue.	CORTICAL LYMPHOCYTES/UNIT AREA, Slight. PARACORTICAL LYMPHOCYTES/UNIT AREA, Moderate. PROMINENT HISTIOCYTES, Multifocal, Minimal.
Lungs	No gross observations on tissue.	PERIALVEOLAR/PERIVASCULAR SUBACUTE/CHRONIC INFLAMMATORY CELL INFILTRATE, Multifocal, Minimal. ALVEOLAR/INTRAALVEOLAR MACROPHAGES, Multifocal, Minimal.

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Propane: Combined Repeated-Exposure Toxicity,
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via Whole-Body Inhalation Exposures
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STATUS: Final phase sacrifice | SEX: Male | ANIMAL: 4009
PHASE DAY OF DEATH: 30 | PHASE: Dosing phase | GROUP: 4

Tissue	Gross Observations/Comments	Microscopic Observations/Comments
Lungs		VESSEL MINERALIZATION, Multifocal, Minimal. - LOBES ARE PARTIALLY ATELECTATIC.
Mammary-protocol	No gross observations on tissue.	MALE TYPE: (UNDIFFRENTIATED TYPE), Present.
Parathyroid	No gross observations on tissue.	Tissue is unremarkable (with comment). - TISSUE MISSING FROM SLIDE
Rectum/Low Colon	No gross observations on tissue.	INTRALUMINAL (HELMINTHIC) PARASITE, Minimal.
Testes	No gross observations on tissue.	SERTOLI CELL VACUOLATION, UNILATERAL, Focal, Minimal.
Thyroid	No gross observations on tissue.	Tissue is missing. - TISSUE MISSING FROM SLIDE.
Thymus	No gross observations on tissue.	INVOLUTION/CORTICAL LYMPHOCYTOSIS, Minimal. HEMORRHAGE, Multifocal, Minimal. - TISSUE IS FRAGMENTED, BUT READABLE.

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Propane: Combined Repeated-Exposure Toxicity,
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STATUS: Final phase sacrifice	SEX: Male	ANIMAL: 4009
PHASE DAY OF DEATH: 30	PHASE: Dosing phase	GROUP: 4

Tissue	Gross Observations/Comments	Microscopic Observations/Comments

Tissues without comment under Gross Observations were within normal limits at necropsy.
The following tissues were unremarkable microscopically:

Adrenal Glands	Sternal Marrow	Femoral Marrow	Brain	Sternum
Femur	Cecum	Colon	Duodenum	Epididymides
Ileum	Jejunum	Liver	Tibial Nerve	Prostate
Cervical SC	Thoracic SC	Lumbar SC	Skin-protocol	Spleen
Stomach	Seminal vesicles	Trachea	Urinary bladder	

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Propane: Combined Repeated-Exposure Toxicity,
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STATUS: Final phase sacrifice | SEX: Male | ANIMAL: 4010
PHASE DAY OF DEATH: 30 | PHASE: Dosing phase | GROUP: 4

Tissue	Gross Observations/Comments	Microscopic Observations/Comments
Heart	No gross observations on tissue.	Tissue is unremarkable (with comment). - ONLY ONE AURICLE PRESENT/EVALUATED.
Liver	No gross observations on tissue.	SUBACUTE/CHRONIC INFLAMMATORY CELL FOCI, Multifocal, Minimal.
Mesenteric LN	No gross observations on tissue.	CORTICAL LYMPHOCYTES/UNIT AREA, Slight. PARACORTICAL LYMPHOCYTES/UNIT AREA, Marked. FOLLICULAR GERMINAL CENTER DEVELOPMENT, Multifocal, Moderate.
Mediastinal LN	No gross observations on tissue.	CORTICAL LYMPHOCYTES/UNIT AREA, Moderate. PARACORTICAL LYMPHOCYTES/UNIT AREA, Moderate. FOLLICULAR GERMINAL CENTER DEVELOPMENT, Multifocal, Moderate.
Lungs	No gross observations on tissue.	PERIALVEOLAR/PERIVASCULAR SUBACUTE/CHRONIC INFLAMMATORY CELL INFILTRATE, Multifocal, Minimal. ALVEOLAR/INTRAALVEOLAR MACROPHAGES, Multifocal, Minimal.
Mammary-protocol	No gross observations on tissue.	MALE TYPE: (UNDIFFRENTIATED TYPE), Multifocal, Present.

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STATUS: Final phase sacrifice | SEX: Male | ANIMAL: 4010
PHASE DAY OF DEATH: 30 | PHASE: Dosing phase | GROUP: 4

Tissue	Gross Observations/Comments	Microscopic Observations/Comments
Tibial Nerve	No gross observations on tissue.	Tissue is unremarkable (with comment). - TISSUE IS FRAGMENTED, BUT READABLE.
Prostate	No gross observations on tissue.	INTERSTITIAL MONONUCLEAR CELL AGGREGATES, Multifocal, Minimal.
Testes	No gross observations on tissue.	SERTOLI CELL VACUOLATION, UNILATERAL, Multifocal, Minimal.
Thymus	No gross observations on tissue.	INVOLUTION/CORTICAL LYMPHOCYTOSIS, Minimal. HEMORRHAGE, Multifocal, Minimal.

Tissues without comment under Gross Observations were within normal limits at necropsy.
The following tissues were unremarkable microscopically:

Adrenal Glands	Sternal Marrow	Femoral Marrow	Brain	Sternum
Femur	Cecum	Colon	Duodenum	Epididymides
Ileum	Jejunum	Kidneys	Parathyroid	Rectum/Low Colon
Cervical SC	Thoracic SC	Lumbar SC	Skin-protocol	Spleen
Stomach	Seminal vesicles	Thyroid	Trachea	Urinary bladder

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Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice | SEX: Male | ANIMAL: 4011
PHASE DAY OF DEATH: 30 | PHASE: Dosing phase | GROUP: 4

Tissue	Gross Observations/Comments	Microscopic Observations/Comments
Femur	No gross observations on tissue.	EPIPHYSEAL SUBCHONDRAL CYST(S), Focal, Slight.
Kidneys	No gross observations on tissue.	PELVIC DILATATION, UNILATERAL, Minimal.
Mesenteric LN	No gross observations on tissue.	CORTICAL LYMPHOCYTES/UNIT AREA, Moderate. PARACORTICAL LYMPHOCYTES/UNIT AREA, Marked. FOLLICULAR GERMINAL CENTER DEVELOPMENT, Multifocal, Moderate. FREE ERYTHROCYTES/ERYTHROPHAGOCYTOSIS, Multifocal, Minimal.
Mediastinal LN	No gross observations on tissue.	CORTICAL LYMPHOCYTES/UNIT AREA, Moderate. PARACORTICAL LYMPHOCYTES/UNIT AREA, Marked. FOLLICULAR GERMINAL CENTER DEVELOPMENT, Multifocal, Slight. PROMINENT HISTIOCYTES, Multifocal, Minimal.
Lungs	No gross observations on tissue.	ALVEOLAR/INTRAALVEOLAR MACROPHAGES, Multifocal, Minimal. VESSEL MINERALIZATION, Multifocal, Minimal. - LOBES ARE PARTIALLY ATELECTATIC.

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Propane: Combined Repeated-Exposure Toxicity,
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Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice | SEX: Male | ANIMAL: 4011
PHASE DAY OF DEATH: 30 | PHASE: Dosing phase | GROUP: 4

Tissue	Gross Observations/Comments	Microscopic Observations/Comments
Mammary-protocol	No gross observations on tissue.	MALE TYPE: (UNDIFFRENTIATED TYPE), Present.
Tibial Nerve	No gross observations on tissue.	Tissue is unremarkable (with comment). - TISSUE IS FRAGMENTED, BUT READABLE.
Parathyroid	No gross observations on tissue.	Tissue is missing. - TISSUE MISSING FROM SLIDE
Skin-protocol	No gross observations on tissue.	FOLLICULAR DILATATION/HAIR FOLLICLES: EMPTY/WITHOUT HAIRSHAFT, Multifocal, Minimal.
Thyroid	No gross observations on tissue.	Tissue is unremarkable; one-of-pair missing.
Thymus	No gross observations on tissue.	INVOLUTION/CORTICAL LYMPHOCYTOSIS, Minimal. HEMORRHAGE, Multifocal, Minimal.
Urinary bladder	No gross observations on tissue.	Tissue is unremarkable (with comment). - POOR SECTION QUALITY. RECUT: NO IMPROVEMENT.

Tissues without comment under Gross Observations were within normal limits at necropsy.
The following tissues were unremarkable microscopically:
Adrenal Glands Sternal Marrow Femoral Marrow Brain Sternum

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STATUS: Final phase sacrifice	SEX: Male	ANIMAL: 4011
PHASE DAY OF DEATH: 30	PHASE: Dosing phase	GROUP: 4

Tissue	Gross Observations/Comments	Microscopic Observations/Comments

Tissues without comment under Gross Observations were within normal limits at necropsy.
The following tissues were unremarkable microscopically:

Cecum	Colon	Duodenum	Epididymides	Heart
Ileum	Jejunum	Liver	Prostate	Rectum/Low Colon
Cervical SC	Thoracic SC	Lumbar SC	Spleen	Stomach
Seminal vesicles	Testes	Trachea		

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STATUS: Final phase sacrifice | SEX: Male | ANIMAL: 4012
PHASE DAY OF DEATH: 30 | PHASE: Dosing phase | GROUP: 4

Tissue	Gross Observations/Comments	Microscopic Observations/Comments
Epididymides	No gross observations on tissue.	MONONUCLEAR CELL AGGREGATES, UNILATERAL, Focal, Minimal.
Heart	No gross observations on tissue.	SUBACUTE/CHRONIC INFLAMMATORY CELL INFILTRATE, Multifocal, Minimal. - TISSUE IS FRAGMENTED, BUT READABLE.
Mesenteric LN	No gross observations on tissue.	CORTICAL LYMPHOCYTES/UNIT AREA, Slight. PARACORTICAL LYMPHOCYTES/UNIT AREA, Marked. FOLLICULAR GERMINAL CENTER DEVELOPMENT, Multifocal, Moderate. PROMINENT HISTIOCYTES, Multifocal, Slight.
Mediastinal LN	No gross observations on tissue.	CORTICAL LYMPHOCYTES/UNIT AREA, Moderate. PARACORTICAL LYMPHOCYTES/UNIT AREA, Moderate. FOLLICULAR GERMINAL CENTER DEVELOPMENT, Multifocal, Moderate.
Lungs	No gross observations on tissue.	PERIALVEOLAR/PERIVASCULAR SUBACUTE/CHRONIC INFLAMMATORY CELL INFILTRATE, Multifocal, Minimal. SUBACUTE/CHRONIC INFLAMMATORY CELL FOCI, Multifocal, Minimal.

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STATUS: Final phase sacrifice | SEX: Male | ANIMAL: 4012
PHASE DAY OF DEATH: 30 | PHASE: Dosing phase | GROUP: 4

Tissue	Gross Observations/Comments	Microscopic Observations/Comments
Lungs		ALVEOLAR/INTRAALVEOLAR MACROPHAGES, Multifocal, Minimal. VESSEL MINERALIZATION, Multifocal, Minimal. - LOBES ARE PARTIALLY ATELECTATIC.
Mammary-protocol	No gross observations on tissue.	MALE TYPE: (UNDIFFRENTIATED TYPE), Present.
Tibial Nerve	No gross observations on tissue.	Tissue is unremarkable (with comment). - TISSUE IS FRAGMENTED, BUT READABLE.
Parathyroid	No gross observations on tissue.	Tissue is missing.
Cervical SC	No gross observations on tissue.	Tissue is unremarkable (with comment). - TISSUE IS FRAGMENTED, BUT READABLE.
Thoracic SC	No gross observations on tissue.	Tissue is unremarkable (with comment). - TISSUE IS FRAGMENTED, BUT READABLE.
Testes	No gross observations on tissue.	SERTOLI CELL VACUOLATION, UNILATERAL, Multifocal, Minimal.
Thymus	No gross observations on tissue.	INVOLUTION/CORTICAL LYMPHOCYTOSIS, Minimal. HEMORRHAGE, Multifocal, Minimal.

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Propane: Combined Repeated-Exposure Toxicity,
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via Whole-Body Inhalation Exposures
Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice	SEX: Male	ANIMAL: 4012
PHASE DAY OF DEATH: 30	PHASE: Dosing phase	GROUP: 4

Tissue	Gross Observations/Comments	Microscopic Observations/Comments

Tissues without comment under Gross Observations were within normal limits at necropsy.
The following tissues were unremarkable microscopically:

Adrenal Glands	Sternal Marrow	Femoral Marrow	Brain	Sternum
Femur	Cecum	Colon	Duodenum	Ileum
Jejunum	Kidneys	Liver	Prostate	Rectum/Low Colon
Lumbar SC	Skin-protocol	Spleen	Stomach	Seminal vesicles
Thyroid	Trachea	Urinary bladder		

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Propane: Combined Repeated-Exposure Toxicity,
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Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice	SEX: Female	ANIMAL: 1501
PHASE DAY OF DEATH: 29	PHASE: Dosing phase	GROUP: 1

Tissue	Gross Observations/Comments	Microscopic Observations/Comments
Heart	No gross observations on tissue.	Tissue is unremarkable (with comment). - TISSUE IS FRAGMENTED, BUT READABLE.
Kidneys	No gross observations on tissue.	CORTEX: CONVOLUTED TUBULAR EPITHELIUM-BASOPHILIC, UNILATERAL, Focal, Minimal. MEDULLARY TUBULAR CYSTIC DILATATION, UNILATERAL, Moderate.
Mesenteric LN	No gross observations on tissue.	CORTICAL LYMPHOCYTES/UNIT AREA, Minimal. PARACORTICAL LYMPHOCYTES/UNIT AREA, Marked. FOLLICULAR GERMINAL CENTER DEVELOPMENT, Multifocal, Slight. PROMINENT HISTIOCYTES, Multifocal, Minimal.
Mediastinal LN	No gross observations on tissue.	CORTICAL LYMPHOCYTES/UNIT AREA, Minimal. PARACORTICAL LYMPHOCYTES/UNIT AREA, Moderate. FREE ERYTHROCYTES/ERYTHROPHAGOCYTOSIS, Multifocal, Minimal. BROWN PIGMENT, Moderate.
Lungs	No gross observations on tissue.	ALVEOLAR/INTRAALVEOLAR MACROPHAGES, Multifocal, Minimal.

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Propane: Combined Repeated-Exposure Toxicity,
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Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice | SEX: Female | ANIMAL: 1501
PHASE DAY OF DEATH: 29 | PHASE: Dosing phase | GROUP: 1

Tissue	Gross Observations/Comments	Microscopic Observations/Comments
Lungs		VESSEL MINERALIZATION, Multifocal, Minimal. - LOBES ARE PARTIALLY ATELECTATIC.
Mammary-protocol	No gross observations on tissue.	FEMALE TYPE (DIFFERENTIATED TYPE), Present.
Tibial Nerve	No gross observations on tissue.	Tissue is unremarkable (with comment). - TISSUE IS FRAGMENTED, BUT READABLE.
Ovaries	No gross observations on tissue.	SERTOLIFORM CELLS, UNILATERAL, Slight.
Parathyroid	No gross observations on tissue.	Tissue is missing. - TISSUE MISSING FROM SLIDE
Skin-protocol	No gross observations on tissue.	FOLLICULAR DILATATION/HAIR FOLLICLES: EMPTY/WITHOUT HAIRSHAFT, Multifocal, Minimal.
Thyroid	No gross observations on tissue.	ULTIMOBRANCHIAL REST(S), UNILATERAL, Focal, Minimal.
Thymus	No gross observations on tissue.	INVOLUTION/CORTICAL LYMPHOCYTOSIS, Minimal.
Uterus	No gross observations on tissue.	LUMINAL DILATATION, BILATERAL, Moderate.

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STATUS: Final phase sacrifice	SEX: Female	ANIMAL: 1501
PHASE DAY OF DEATH: 29	PHASE: Dosing phase	GROUP: 1

Tissue	Gross Observations/Comments	Microscopic Observations/Comments

Tissues without comment under Gross Observations were within normal limits at necropsy.
The following tissues were unremarkable microscopically:

Adrenal Glands	Sternal Marrow	Femoral Marrow	Brain	Sternum
Femur	Cecum	Colon	Duodenum	Ileum
Jejunum	Liver	Oviducts/Fallop	Rectum/Low Colon	Cervical SC
Thoracic SC	Lumbar SC	Spleen	Stomach	Trachea
Urinary bladder	Vagina			

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Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice | SEX: Female | ANIMAL: 1502
PHASE DAY OF DEATH: 29 | PHASE: Dosing phase | GROUP: 1

Tissue	Gross Observations/Comments	Microscopic Observations/Comments
Heart	No gross observations on tissue.	Tissue is unremarkable (with comment). - ONLY ONE AURICLE PRESENT/EVALUATED.
Kidneys	No gross observations on tissue.	CORTEX/CORTICO-MEDULLARY JUNCTION: MINERAL DEPOSIT(S), BILATERAL, Multifocal, Minimal.
Mesenteric LN	No gross observations on tissue.	CORTICAL LYMPHOCYTES/UNIT AREA, Multifocal, Slight. PARACORTICAL LYMPHOCYTES/UNIT AREA, Marked. FOLLICULAR GERMINAL CENTER DEVELOPMENT, Multifocal, Moderate. PROMINENT HISTIOCYTES, Multifocal, Minimal.
Mediastinal LN	No gross observations on tissue.	CORTICAL LYMPHOCYTES/UNIT AREA, Slight. PARACORTICAL LYMPHOCYTES/UNIT AREA, Moderate. FOLLICULAR GERMINAL CENTER DEVELOPMENT, Multifocal, Minimal. PROMINENT PLASMA CELLS, Multifocal, Slight.
Lungs	No gross observations on tissue.	SUBACUTE/CHRONIC INFLAMMATORY CELL FOCI, Multifocal, Slight. ALVEOLAR/INTRAALVEOLAR MACROPHAGES, Multifocal, Minimal.

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via Whole-Body Inhalation Exposures
Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice		SEX: Female	ANIMAL: 1502
PHASE DAY OF DEATH: 29		PHASE: Dosing phase	GROUP: 1
Tissue	Gross Observations/Comments	Microscopic Observations/Comments	
Lungs		VESSEL MINERALIZATION, Minimal. - LOBES ARE PARTIALLY ATELECTATIC.	
Mammary-protocol . . .	No gross observations on tissue.	FEMALE TYPE (DIFFERENTIATED TYPE), Present.	
Tibial Nerve	No gross observations on tissue.	Tissue is unremarkable (with comment). - TISSUE IS FRAGMENTED, BUT READABLE.	
Ovaries	No gross observations on tissue.	SERTOLIFORM CELLS, UNILATERAL, Minimal.	
Parathyroid	No gross observations on tissue.	Tissue is unremarkable; one-of-pair missing.	
Cervical SC	No gross observations on tissue.	Tissue is unremarkable (with comment). - TISSUE IS FRAGMENTED, BUT READABLE.	
Thoracic SC	No gross observations on tissue.	Tissue is unremarkable (with comment). - TISSUE IS FRAGMENTED, BUT READABLE.	
Lumbar SC	No gross observations on tissue.	Tissue is unremarkable (with comment). - TISSUE IS FRAGMENTED, BUT READABLE.	
Skin-protocol	No gross observations on tissue.	FOLLICULAR DILATATION/HAIR FOLLICLES: EMPTY/WITHOUT HAIRSHAFT, Multifocal, Minimal.	

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STATUS: Final phase sacrifice | SEX: Female | ANIMAL: 1502
PHASE DAY OF DEATH: 29 | PHASE: Dosing phase | GROUP: 1

Tissue	Gross Observations/Comments	Microscopic Observations/Comments
Skin (other)	Hair Thin/Absent, Forepaw(s), Moderate/ Bilateral	Examined; 1 correlation found: PYOGRANULOMATOUS INFLAMMATORY CELL INFILTRATE, Multifocal, Moderate.
Thymus	No gross observations on tissue.	INVOLUTION/CORTICAL LYMPHOCYTOSIS, Minimal.
Uterus	No gross observations on tissue.	LUMINAL DILATATION, BILATERAL, Moderate.

Tissues without comment under Gross Observations were within normal limits at necropsy.
The following tissues were unremarkable microscopically:

Adrenal Glands	Sternal Marrow	Femoral Marrow	Brain	Sternum
Femur	Cecum	Colon	Duodenum	Ileum
Jejunum	Liver	Oviducts/Fallop	Rectum/Low Colon	Spleen
Stomach	Thyroid	Trachea	Urinary bladder	Vagina

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STATUS: Final phase sacrifice | SEX: Female | ANIMAL: 1503
PHASE DAY OF DEATH: 29 | PHASE: Dosing phase | GROUP: 1

Tissue	Gross Observations/Comments	Microscopic Observations/Comments
Heart	No gross observations on tissue.	SUBACUTE/CHRONIC INFLAMMATORY CELL INFILTRATE, Multifocal, Minimal.
Kidneys	No gross observations on tissue.	CORTEX/CORTICO-MEDULLARY JUNCTION: MINERAL DEPOSIT(S), UNILATERAL, Focal, Minimal.
Mesenteric LN	No gross observations on tissue.	CORTICAL LYMPHOCYTES/UNIT AREA, Moderate. PARACORTICAL LYMPHOCYTES/UNIT AREA, Moderate. FOLLICULAR GERMINAL CENTER DEVELOPMENT, Moderate. PROMINENT HISTIOCYTES, Multifocal, Slight.
Mediastinal LN	No gross observations on tissue.	CORTICAL LYMPHOCYTES/UNIT AREA, Slight. PARACORTICAL LYMPHOCYTES/UNIT AREA, Moderate. FREE ERYTHROCYTES/ERYTHROPHAGOCYTOSIS, Multifocal, Minimal. PROMINENT PLASMA CELLS, Multifocal, Minimal.
Lungs	No gross observations on tissue.	ALVEOLAR/INTRAALVEOLAR MACROPHAGES, Multifocal, Minimal.

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Propane: Combined Repeated-Exposure Toxicity,
Reproduction and Neurotoxicity Screening in Rats
via Whole-Body Inhalation Exposures
Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice | SEX: Female | ANIMAL: 1503
PHASE DAY OF DEATH: 29 | PHASE: Dosing phase | GROUP: 1

Tissue	Gross Observations/Comments	Microscopic Observations/Comments
Mammary-protocol	No gross observations on tissue.	FEMALE TYPE (DIFFERENTIATED TYPE), Present.
Parathyroid	No gross observations on tissue.	Tissue is missing. - TISSUE MISSING FROM SLIDE
Thymus	No gross observations on tissue.	INVOLUTION/CORTICAL LYMPHOCYTOSIS, Minimal. MEDULLA/HASSALL'S CORPUSCLE: CELLULAR NECROSIS/DEBRIS, Minimal.
Uterus	No gross observations on tissue.	LUMINAL DILATATION, BILATERAL, Slight.

Tissues without comment under Gross Observations were within normal limits at necropsy.
The following tissues were unremarkable microscopically:

Adrenal Glands	Sternal Marrow	Femoral Marrow	Brain	Sternum
Femur	Cecum	Colon	Duodenum	Ileum
Jejunum	Liver	Tibial Nerve	Oviducts/Fallop	Ovaries
Rectum/Low Colon	Cervical SC	Thoracic SC	Lumbar SC	Skin-protocol
Spleen	Stomach	Thyroid	Trachea	Urinary bladder
Vagina				

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Propane: Combined Repeated-Exposure Toxicity,
Reproduction and Neurotoxicity Screening in Rats
via Whole-Body Inhalation Exposures
Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice | SEX: Female | ANIMAL: 1504
PHASE DAY OF DEATH: 29 | PHASE: Dosing phase | GROUP: 1

Tissue	Gross Observations/Comments	Microscopic Observations/Comments
Brain	No gross observations on tissue.	Tissue is unremarkable (with comment). - TISSUE IS FRAGMENTED, BUT READABLE.
Heart	No gross observations on tissue.	Tissue is unremarkable (with comment). - MEDIASTINAL LYMPHOID TISSUE NEAR MAJOR BLOOD VESSELS.
Kidneys	No gross observations on tissue.	CORTEX/CORTICO-MEDULLARY JUNCTION: MINERAL DEPOSIT(S), UNILATERAL, Focal, Minimal.
Mesenteric LN	No gross observations on tissue.	CORTICAL LYMPHOCYTES/UNIT AREA, Moderate. PARACORTICAL LYMPHOCYTES/UNIT AREA, Moderate. FOLLICULAR GERMINAL CENTER DEVELOPMENT, Multifocal, Moderate.
Mediastinal LN	No gross observations on tissue.	CORTICAL LYMPHOCYTES/UNIT AREA, Minimal. PARACORTICAL LYMPHOCYTES/UNIT AREA, Moderate.
Lungs	No gross observations on tissue.	ALVEOLAR/INTRAALVEOLAR MACROPHAGES, Multifocal, Minimal. FOAMY MACROPHAGES, Focal, Minimal. VESSEL MINERALIZATION, Multifocal, Minimal.

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Propane: Combined Repeated-Exposure Toxicity,
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via Whole-Body Inhalation Exposures
Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice	SEX: Female	ANIMAL: 1504
PHASE DAY OF DEATH: 29	PHASE: Dosing phase	GROUP: 1

Tissue	Gross Observations/Comments	Microscopic Observations/Comments
Lungs		- LOBES ARE PARTIALLY ATELECTATIC.
Mammary-protocol	No gross observations on tissue.	FEMALE TYPE (DIFFERENTIATED TYPE), Present.
Parathyroid	No gross observations on tissue.	No micropathology observations on tissue; one-of-pair missing.
Cervical SC	No gross observations on tissue.	Tissue is unremarkable (with comment). - POOR SECTION QUALITY. RECUT: NO IMPROVEMENT.
Thoracic SC	No gross observations on tissue.	Tissue is unremarkable (with comment). - POOR SECTION QUALITY. RECUT: NO IMPROVEMENT.
Thymus	No gross observations on tissue.	INVOLUTION/CORTICAL LYMPHOCYTOSIS, Minimal.

Tissues without comment under Gross Observations were within normal limits at necropsy.
The following tissues were unremarkable microscopically:

Adrenal Glands	Sternal Marrow	Femoral Marrow	Sternum	Femur
Cecum	Colon	Duodenum	Ileum	Jejunum

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Propane: Combined Repeated-Exposure Toxicity,
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via Whole-Body Inhalation Exposures
Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice | SEX: Female | ANIMAL: 1504
PHASE DAY OF DEATH: 29 | PHASE: Dosing phase | GROUP: 1

Tissue	Gross Observations/Comments			Microscopic Observations/Comments
Liver	Tibial Nerve	Oviducts/Fallop	Ovaries	Rectum/Low Colon
Lumbar SC	Skin-protocol	Spleen	Stomach	Thyroid
Trachea	Urinary bladder	Uterus	Vagina	

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Propane: Combined Repeated-Exposure Toxicity,
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via Whole-Body Inhalation Exposures
Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice	SEX: Female	ANIMAL: 1505
PHASE DAY OF DEATH: 29	PHASE: Dosing phase	GROUP: 1

Tissue	Gross Observations/Comments	Microscopic Observations/Comments
Heart	No gross observations on tissue.	SUBACUTE/CHRONIC INFLAMMATORY CELL INFILTRATE, Multifocal, Minimal.
Mesenteric LN	No gross observations on tissue.	CORTICAL LYMPHOCYTES/UNIT AREA, Slight. PARACORTICAL LYMPHOCYTES/UNIT AREA, Moderate. FOLLICULAR GERMINAL CENTER DEVELOPMENT, Multifocal, Moderate.
Mediastinal LN	No gross observations on tissue.	Tissue is missing. - TISSUE MISIDENTIFIED. RESAMPLE: NO IMPROVEMENT.
Lungs	No gross observations on tissue.	PERIALVEOLAR/PERIVASCULAR SUBACUTE/CHRONIC INFLAMMATORY CELL INFILTRATE, Multifocal, Minimal. SUBACUTE/CHRONIC INFLAMMATORY CELL FOCI, Multifocal, Minimal. ALVEOLAR/INTRAALVEOLAR MACROPHAGES, Multifocal, Minimal. VESSEL MINERALIZATION, Multifocal, Minimal.
Mammary-protocol	No gross observations on tissue.	FEMALE TYPE (DIFFERENTIATED TYPE), Present.

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Propane: Combined Repeated-Exposure Toxicity,
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via Whole-Body Inhalation Exposures
Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice | SEX: Female | ANIMAL: 1505
PHASE DAY OF DEATH: 29 | PHASE: Dosing phase | GROUP: 1

Tissue	Gross Observations/Comments	Microscopic Observations/Comments
Tibial Nerve	No gross observations on tissue.	Tissue is unremarkable (with comment). - TISSUE IS FRAGMENTED, BUT READABLE.
Parathyroid	No gross observations on tissue.	Tissue is missing. - TISSUE MISSING FROM SLIDE
Thoracic SC	No gross observations on tissue.	Tissue is missing. - POOR SECTION QUALITY. RECUT: NO IMPROVEMENT.
Thymus	No gross observations on tissue.	INVOLUTION/CORTICAL LYMPHOCYTOSIS, Minimal.

Tissues without comment under Gross Observations were within normal limits at necropsy.
The following tissues were unremarkable microscopically:

Adrenal Glands	Sternal Marrow	Femoral Marrow	Brain	Sternum
Femur	Cecum	Colon	Duodenum	Ileum
Jejunum	Kidneys	Liver	Oviducts/Fallop	Ovaries
Rectum/Low Colon	Cervical SC	Lumbar SC	Skin-protocol	Spleen
Stomach	Thyroid	Trachea	Urinary bladder	Uterus
Vagina				

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Propane: Combined Repeated-Exposure Toxicity,
Reproduction and Neurotoxicity Screening in Rats
via Whole-Body Inhalation Exposures
Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice | SEX: Female | ANIMAL: 1506
PHASE DAY OF DEATH: 29 | PHASE: Dosing phase | GROUP: 1

Tissue	Gross Observations/Comments	Microscopic Observations/Comments
Heart	No gross observations on tissue.	SUBACUTE/CHRONIC INFLAMMATORY CELL INFILTRATE, Multifocal, Minimal.
Mesenteric LN	No gross observations on tissue.	CORTICAL LYMPHOCYTES/UNIT AREA, Moderate. PARACORTICAL LYMPHOCYTES/UNIT AREA, Moderate. FOLLICULAR GERMINAL CENTER DEVELOPMENT, Multifocal, Moderate. PROMINENT HISTIOCYTES, Multifocal, Slight. PROMINENT PLASMA CELLS, Multifocal, Minimal.
Mediastinal LN	No gross observations on tissue.	CORTICAL LYMPHOCYTES/UNIT AREA, Slight. PARACORTICAL LYMPHOCYTES/UNIT AREA, Moderate. FOLLICULAR GERMINAL CENTER DEVELOPMENT, Multifocal, Slight. FREE ERYTHROCYTES/ERYTHROPHAGOCYTOSIS, Multifocal, Minimal.
Lungs	No gross observations on tissue.	ALVEOLAR/INTRAALVEOLAR MACROPHAGES, Multifocal, Minimal. VESSEL MINERALIZATION, Multifocal, Minimal.

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Propane: Combined Repeated-Exposure Toxicity,
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Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice | SEX: Female | ANIMAL: 1506
PHASE DAY OF DEATH: 29 | PHASE: Dosing phase | GROUP: 1

Tissue	Gross Observations/Comments	Microscopic Observations/Comments
Mammary-protocol	No gross observations on tissue.	FEMALE TYPE (DIFFERENTIATED TYPE), Present.
Tibial Nerve	No gross observations on tissue.	Tissue is unremarkable (with comment). - POOR SECTION QUALITY: RECUT, NO IMPROVEMENT.
Thymus	No gross observations on tissue.	INVOLUTION/CORTICAL LYMPHOCYTOSIS, Minimal.

Tissues without comment under Gross Observations were within normal limits at necropsy.
The following tissues were unremarkable microscopically:

Adrenal Glands	Sternal Marrow	Femoral Marrow	Brain	Sternum
Femur	Cecum	Colon	Duodenum	Ileum
Jejunum	Kidneys	Liver	Oviducts/Fallop	Ovaries
Parathyroid	Rectum/Low Colon	Cervical SC	Thoracic SC	Lumbar SC
Skin-protocol	Spleen	Stomach	Thyroid	Trachea
Urinary bladder	Uterus	Vagina		

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STATUS: Final phase sacrifice | SEX: Female | ANIMAL: 1507
PHASE DAY OF DEATH: 30 | PHASE: Dosing phase | GROUP: 1

Tissue	Gross Observations/Comments	Microscopic Observations/Comments
Kidneys	No gross observations on tissue.	CORTEX/CORTICO-MEDULLARY JUNCTION: MINERAL DEPOSIT(S), BILATERAL, Multifocal, Minimal.
Mesenteric LN	No gross observations on tissue.	CORTICAL LYMPHOCYTES/UNIT AREA, Slight. PARACORTICAL LYMPHOCYTES/UNIT AREA, Marked. FOLLICULAR GERMINAL CENTER DEVELOPMENT, Multifocal, Moderate. PROMINENT PLASMA CELLS, Multifocal, Minimal.
Mediastinal LN	No gross observations on tissue.	CORTICAL LYMPHOCYTES/UNIT AREA, Minimal. PARACORTICAL LYMPHOCYTES/UNIT AREA, Marked. FOLLICULAR GERMINAL CENTER DEVELOPMENT, Multifocal, Slight. FREE ERYTHROCYTES/ERYTHROPHAGOCYTOSIS, Multifocal, Minimal.
Lungs	No gross observations on tissue.	PERIALVEOLAR/PERIVASCULAR SUBACUTE/CHRONIC INFLAMMATORY CELL INFILTRATE, Multifocal, Minimal. ALVEOLAR/INTRAALVEOLAR MACROPHAGES, Multifocal, Minimal. VESSEL MINERALIZATION, Multifocal, Minimal.

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Propane: Combined Repeated-Exposure Toxicity,
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via Whole-Body Inhalation Exposures
Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice	SEX: Female	ANIMAL: 1507
PHASE DAY OF DEATH: 30	PHASE: Dosing phase	GROUP: 1

Tissue	Gross Observations/Comments	Microscopic Observations/Comments
Mammary-protocol . . .	No gross observations on tissue.	FEMALE TYPE (DIFFERENTIATED TYPE), Present.
Tibial Nerve	No gross observations on tissue.	Tissue is unremarkable (with comment). - TISSUE IS FRAGMENTED, BUT READABLE.
Cervical SC	No gross observations on tissue.	Tissue is unremarkable (with comment). - TISSUE IS FRAGMENTED, BUT READABLE.
Thoracic SC	No gross observations on tissue.	Tissue is unremarkable (with comment). - TISSUE IS FRAGMENTED, BUT READABLE.
Lumbar SC	No gross observations on tissue.	Tissue is unremarkable (with comment). - TISSUE IS FRAGMENTED, BUT READABLE.
Skin (other)	Hair Thin/Absent, Forelegs, Moderate	Examined; 3 correlations found: FOLLICULAR HYPERKERATOSIS, Multifocal, Minimal. HAIR FOLLICLE: MATRIX/PAPILLA/SHAFT DEGENERATION/NECROSIS, Multifocal, Minimal. FOLLICULAR DILATATION, Multifocal, Minimal.
Thymus	No gross observations on tissue.	INVOLUTION/CORTICAL LYMPHOCYTOSIS, Minimal.

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Propane: Combined Repeated-Exposure Toxicity,
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Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice	SEX: Female	ANIMAL: 1507
PHASE DAY OF DEATH: 30	PHASE: Dosing phase	GROUP: 1

Tissue	Gross Observations/Comments	Microscopic Observations/Comments

Tissues without comment under Gross Observations were within normal limits at necropsy.
The following tissues were unremarkable microscopically:

Adrenal Glands	Sternal Marrow	Femoral Marrow	Brain	Sternum
Femur	Cecum	Colon	Duodenum	Heart
Ileum	Jejunum	Liver	Oviducts/Fallop	Ovaries
Parathyroid	Rectum/Low Colon	Skin-protocol	Spleen	Stomach
Thyroid	Trachea	Urinary bladder	Uterus	Vagina

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Propane: Combined Repeated-Exposure Toxicity,
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via Whole-Body Inhalation Exposures
Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice | SEX: Female | ANIMAL: 1508
PHASE DAY OF DEATH: 30 | PHASE: Dosing phase | GROUP: 1

Tissue	Gross Observations/Comments	Microscopic Observations/Comments
Kidneys	No gross observations on tissue.	CORTEX: CONVOLUTED TUBULAR EPITHELIUM-BASOPHILIC, UNILATERAL, Focal, Minimal. CORTEX/CORTICO-MEDULLARY JUNCTION: MINERAL DEPOSIT(S), BILATERAL, Multifocal, Minimal.
Mesenteric LN	No gross observations on tissue.	CORTICAL LYMPHOCYTES/UNIT AREA, Slight. PARACORTICAL LYMPHOCYTES/UNIT AREA, Moderate. FOLLICULAR GERMINAL CENTER DEVELOPMENT, Multifocal, Moderate. PROMINENT HISTIOCYTES, Multifocal, Minimal.
Mediastinal LN	No gross observations on tissue.	CORTICAL LYMPHOCYTES/UNIT AREA, Slight. PARACORTICAL LYMPHOCYTES/UNIT AREA, Moderate. FOLLICULAR GERMINAL CENTER DEVELOPMENT, Multifocal, Minimal. FREE ERYTHROCYTES/ERYTHROPHAGOCYTOSIS, Multifocal, Slight.
Lungs	No gross observations on tissue.	PERIALVEOLAR/PERIVASCULAR SUBACUTE/CHRONIC INFLAMMATORY CELL INFILTRATE, Multifocal, Minimal.

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Propane: Combined Repeated-Exposure Toxicity,
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via Whole-Body Inhalation Exposures
Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice	SEX: Female	ANIMAL: 1508
PHASE DAY OF DEATH: 30	PHASE: Dosing phase	GROUP: 1

Tissue	Gross Observations/Comments	Microscopic Observations/Comments
Lungs		SUBACUTE/CHRONIC INFLAMMATORY CELL FOCI, Multifocal, Minimal. ALVEOLAR/INTRAALVEOLAR MACROPHAGES, Multifocal, Minimal. VESSEL MINERALIZATION, Multifocal, Minimal. - LOBES ARE PARTIALLY ATELECTATIC.
Mammary-protocol . . .	No gross observations on tissue.	FEMALE TYPE (DIFFERENTIATED TYPE), Present.
Tibial Nerve	No gross observations on tissue.	Tissue is unremarkable (with comment). - TISSUE IS FRAGMENTED, BUT READABLE.
Parathyroid	No gross observations on tissue.	Tissue is missing. - TISSUE MISSING FROM SLIDE
Cervical SC	No gross observations on tissue.	Tissue is unremarkable (with comment). - TISSUE IS FRAGMENTED, BUT READABLE.
Thoracic SC	No gross observations on tissue.	Tissue is unremarkable (with comment). - TISSUE IS FRAGMENTED, BUT READABLE.
Lumbar SC	No gross observations on tissue.	Tissue is unremarkable (with comment). - TISSUE IS FRAGMENTED, BUT READABLE.
Thymus	No gross observations on tissue.	INVOLUTION/CORTICAL LYMPHOCYTOSIS, Minimal.

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Propane: Combined Repeated-Exposure Toxicity,
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via Whole-Body Inhalation Exposures
Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice	SEX: Female	ANIMAL: 1508
PHASE DAY OF DEATH: 30	PHASE: Dosing phase	GROUP: 1

Tissue	Gross Observations/Comments	Microscopic Observations/Comments

Tissues without comment under Gross Observations were within normal limits at necropsy.
The following tissues were unremarkable microscopically:

Adrenal Glands	Sternal Marrow	Femoral Marrow	Brain	Sternum
Femur	Cecum	Colon	Duodenum	Heart
Ileum	Jejunum	Liver	Oviducts/Fallop	Ovaries
Rectum/Low Colon	Skin-protocol	Spleen	Stomach	Thyroid
Trachea	Urinary bladder	Uterus	Vagina	

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Propane: Combined Repeated-Exposure Toxicity,
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via Whole-Body Inhalation Exposures
Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice	SEX: Female	ANIMAL: 1509
PHASE DAY OF DEATH: 30	PHASE: Dosing phase	GROUP: 1

Tissue	Gross Observations/Comments	Microscopic Observations/Comments
Liver	No gross observations on tissue.	SUBACUTE/CHRONIC INFLAMMATORY CELL FOCI, Focal, Minimal.
Mesenteric LN	No gross observations on tissue.	CORTICAL LYMPHOCYTES/UNIT AREA, Moderate. PARACORTICAL LYMPHOCYTES/UNIT AREA, Moderate. FOLLICULAR GERMINAL CENTER DEVELOPMENT, Multifocal, Moderate. PROMINENT HISTIOCYTES, Multifocal, Minimal.
Mediastinal LN	No gross observations on tissue.	CORTICAL LYMPHOCYTES/UNIT AREA, Slight. PARACORTICAL LYMPHOCYTES/UNIT AREA, Moderate. FREE ERYTHROCYTES/ERYTHROPHAGOCYTOSIS, Multifocal, Minimal.
Lungs	No gross observations on tissue.	PERIALVEOLAR/PERIVASCULAR SUBACUTE/CHRONIC INFLAMMATORY CELL INFILTRATE, Multifocal, Minimal. ALVEOLAR/INTRAALVEOLAR MACROPHAGES, Multifocal, Minimal. - LOBES ARE PARTIALLY ATELECTATIC.

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via Whole-Body Inhalation Exposures
Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice | SEX: Female | ANIMAL: 1509
PHASE DAY OF DEATH: 30 | PHASE: Dosing phase | GROUP: 1

Tissue	Gross Observations/Comments	Microscopic Observations/Comments
Mammary-protocol	No gross observations on tissue.	FEMALE TYPE (DIFFERENTIATED TYPE), Present.
Parathyroid	No gross observations on tissue.	Tissue is missing. - TISSUE MISSING FROM SLIDE
Thyroid	No gross observations on tissue.	Tissue is missing. - TISSUE MISSING FROM SLIDE
Thymus	No gross observations on tissue.	INVOLUTION/CORTICAL LYMPHOCYTOSIS, Minimal.
Uterus	No gross observations on tissue.	LUMINAL DILATATION, BILATERAL, Moderate.

Tissues without comment under Gross Observations were within normal limits at necropsy.
The following tissues were unremarkable microscopically:

Adrenal Glands	Sternal Marrow	Femoral Marrow	Brain	Sternum
Femur	Cecum	Colon	Duodenum	Heart
Ileum	Jejunum	Kidneys	Tibial Nerve	Oviducts/Fallop
Ovaries	Rectum/Low Colon	Cervical SC	Thoracic SC	Lumbar SC
Skin-protocol	Spleen	Stomach	Trachea	Urinary bladder
Vagina				

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Propane: Combined Repeated-Exposure Toxicity,
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via Whole-Body Inhalation Exposures
Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice | SEX: Female | ANIMAL: 1510
PHASE DAY OF DEATH: 30 | PHASE: Dosing phase | GROUP: 1

Tissue	Gross Observations/Comments	Microscopic Observations/Comments
Adrenal Glands	No gross observations on tissue.	Tissue is unremarkable (with comment). - ONLY ONE MEDULLA PRESENT
Liver	No gross observations on tissue.	SUBACUTE/CHRONIC INFLAMMATORY CELL FOCI, Multifocal, Minimal.
Mesenteric LN	No gross observations on tissue.	CORTICAL LYMPHOCYTES/UNIT AREA, Moderate. PARACORTICAL LYMPHOCYTES/UNIT AREA, Marked. FOLLICULAR GERMINAL CENTER DEVELOPMENT, Multifocal, Moderate. PROMINENT HISTIOCYTES, Multifocal, Minimal.
Mediastinal LN	No gross observations on tissue.	CORTICAL LYMPHOCYTES/UNIT AREA, Minimal. PARACORTICAL LYMPHOCYTES/UNIT AREA, Marked. FREE ERYTHROCYTES/ERYTHROPHAGOCYTOSIS, Multifocal, Minimal.
Lungs	No gross observations on tissue.	ALVEOLAR/INTRAALVEOLAR MACROPHAGES, Multifocal, Minimal. VESSEL MINERALIZATION, Multifocal, Minimal.
Mammary-protocol	No gross observations on tissue.	FEMALE TYPE (DIFFERENTIATED TYPE), Present.

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Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice	SEX: Female	ANIMAL: 1510
PHASE DAY OF DEATH: 30	PHASE: Dosing phase	GROUP: 1

Tissue	Gross Observations/Comments	Microscopic Observations/Comments
Parathyroid	No gross observations on tissue.	Tissue is missing. - TISSUE MISSING FROM SLIDE
Thyroid	No gross observations on tissue.	Tissue is unremarkable; one-of-pair missing.
Thymus	No gross observations on tissue.	INVOLUTION/CORTICAL LYMPHOCYTOSIS, Minimal.

Tissues without comment under Gross Observations were within normal limits at necropsy.
The following tissues were unremarkable microscopically:

Sternal Marrow	Femoral Marrow	Brain	Sternum	Femur
Cecum	Colon	Duodenum	Heart	Ileum
Jejunum	Kidneys	Tibial Nerve	Oviducts/Fallop	Ovaries
Rectum/Low Colon	Cervical SC	Thoracic SC	Lumbar SC	Skin-protocol
Spleen	Stomach	Trachea	Urinary bladder	Uterus
Vagina				

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Propane: Combined Repeated-Exposure Toxicity,
Reproduction and Neurotoxicity Screening in Rats
via Whole-Body Inhalation Exposures
Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice | SEX: Female | ANIMAL: 1511
PHASE DAY OF DEATH: 30 | PHASE: Dosing phase | GROUP: 1

Tissue	Gross Observations/Comments	Microscopic Observations/Comments
Mesenteric LN	No gross observations on tissue.	CORTICAL LYMPHOCYTES/UNIT AREA, Multifocal, Slight. PARACORTICAL LYMPHOCYTES/UNIT AREA, Marked. FOLLICULAR GERMINAL CENTER DEVELOPMENT, Multifocal, Moderate. PROMINENT HISTIOCYTES, Multifocal, Minimal. PROMINENT PLASMA CELLS, Multifocal, Slight.
Mediastinal LN	No gross observations on tissue.	CORTICAL LYMPHOCYTES/UNIT AREA, Minimal. PARACORTICAL LYMPHOCYTES/UNIT AREA, Moderate. FREE ERYTHROCYTES/ERYTHROPHAGOCYTOSIS, Multifocal, Minimal. - TISSUE IS FRAGMENTED, BUT READABLE.
Lungs	No gross observations on tissue.	ALVEOLAR/INTRAALVEOLAR MACROPHAGES, Multifocal, Minimal.
Mammary-protocol	No gross observations on tissue.	FEMALE TYPE (DIFFERENTIATED TYPE), Present.
Tibial Nerve	No gross observations on tissue.	Tissue is unremarkable (with comment). - TISSUE IS FRAGMENTED, BUT READABLE.

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Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice	SEX: Female	ANIMAL: 1511
PHASE DAY OF DEATH: 30	PHASE: Dosing phase	GROUP: 1

Tissue	Gross Observations/Comments	Microscopic Observations/Comments
Ovaries	No gross observations on tissue.	SERTOLIFORM CELLS, UNILATERAL, Minimal.
Parathyroid	No gross observations on tissue.	Tissue is missing. - TISSUE MISSING FROM SLIDE
Thymus	No gross observations on tissue.	INVOLUTION/CORTICAL LYMPHOCYTOSIS, Minimal. HEMORRHAGE, Multifocal, Minimal. MEDULLA/HASSALL'S CORPUSCLE: CELLULAR NECROSIS/DEBRIS, Focal, Minimal.

Tissues without comment under Gross Observations were within normal limits at necropsy.
The following tissues were unremarkable microscopically:

Adrenal Glands	Sternal Marrow	Femoral Marrow	Brain	Sternum
Femur	Cecum	Colon	Duodenum	Heart
Ileum	Jejunum	Kidneys	Liver	Oviducts/Fallop
Rectum/Low Colon	Cervical SC	Thoracic SC	Lumbar SC	Skin-protocol
Spleen	Stomach	Thyroid	Trachea	Urinary bladder
Uterus	Vagina			

14-Apr-10; 18:47
Huntingdon Life Sciences, Inc. 034245

Propane: Combined Repeated-Exposure Toxicity,
Reproduction and Neurotoxicity Screening in Rats
via Whole-Body Inhalation Exposures
Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice | SEX: Female | ANIMAL: 1512
PHASE DAY OF DEATH: 30 | PHASE: Dosing phase | GROUP: 1

Tissue	Gross Observations/Comments	Microscopic Observations/Comments
Heart	No gross observations on tissue.	SUBACUTE/CHRONIC INFLAMMATORY CELL INFILTRATE, Multifocal, Minimal.
Kidneys	No gross observations on tissue.	PELVIC DILATATION, UNILATERAL, Slight. CORTEX/CORTICO-MEDULLARY JUNCTION: MINERAL DEPOSIT(S), BILATERAL, Multifocal, Minimal.
Mesenteric LN	No gross observations on tissue.	CORTICAL LYMPHOCYTES/UNIT AREA, Slight. PARACORTICAL LYMPHOCYTES/UNIT AREA, Marked. FOLLICULAR GERMINAL CENTER DEVELOPMENT, Multifocal, Moderate. PROMINENT HISTIOCYTES, Multifocal, Minimal. PROMINENT PLASMA CELLS, Multifocal, Minimal.
Mediastinal LN	No gross observations on tissue.	CORTICAL LYMPHOCYTES/UNIT AREA, Minimal. PARACORTICAL LYMPHOCYTES/UNIT AREA, Moderate. FREE ERYTHROCYTES/ERYTHROPHAGOCYTOSIS, Multifocal, Slight.
Lungs	No gross observations on tissue.	ALVEOLAR/INTRAALVEOLAR MACROPHAGES, Multifocal, Minimal.

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Propane: Combined Repeated-Exposure Toxicity,
Reproduction and Neurotoxicity Screening in Rats
via Whole-Body Inhalation Exposures
Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice | SEX: Female | ANIMAL: 1512
PHASE DAY OF DEATH: 30 | PHASE: Dosing phase | GROUP: 1

Tissue	Gross Observations/Comments	Microscopic Observations/Comments
Lungs		- LOBES ARE PARTIALLY ATELECTATIC.
Mammary-protocol	No gross observations on tissue.	FEMALE TYPE (DIFFERENTIATED TYPE), Present.
Tibial Nerve	No gross observations on tissue.	Tissue is unremarkable (with comment). - TISSUE IS FRAGMENTED, BUT READABLE.
Parathyroid	No gross observations on tissue.	Tissue is unremarkable; one-of-pair missing.
Skin-protocol	No gross observations on tissue.	FOLLICULAR DILATATION/HAIR FOLLICLES: EMPTY/WITHOUT HAIRSHAFT, Focal, Minimal.
Thymus	No gross observations on tissue.	INVOLUTION/CORTICAL LYMPHOCYTOSIS, Minimal.

Tissues without comment under Gross Observations were within normal limits at necropsy.
The following tissues were unremarkable microscopically:

Adrenal Glands	Sternal Marrow	Femoral Marrow	Brain	Sternum
Femur	Cecum	Colon	Duodenum	Ileum
Jejunum	Liver	Oviducts/Fallop	Ovaries	Rectum/Low Colon
Cervical SC	Thoracic SC	Lumbar SC	Spleen	Stomach

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Propane: Combined Repeated-Exposure Toxicity,
Reproduction and Neurotoxicity Screening in Rats
via Whole-Body Inhalation Exposures
Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice	SEX: Female	ANIMAL: 1512
PHASE DAY OF DEATH: 30	PHASE: Dosing phase	GROUP: 1

Tissue	Gross Observations/Comments	Microscopic Observations/Comments
Thyroid	Trachea	Urinary bladder
Uterus	Vagina	

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Huntingdon Life Sciences, Inc. 034245

Propane: Combined Repeated-Exposure Toxicity,
Reproduction and Neurotoxicity Screening in Rats
via Whole-Body Inhalation Exposures
Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice	SEX: Female	ANIMAL: 2501
PHASE DAY OF DEATH: 29	PHASE: Dosing phase	GROUP: 2

Tissue	Gross Observations/Comments	Microscopic Observations/Comments

Tissues without comment under Gross Observations were within normal limits at necropsy.
The following tissues were unremarkable microscopically:
No tissues examined.

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Huntingdon Life Sciences, Inc. 034245

Propane: Combined Repeated-Exposure Toxicity,
Reproduction and Neurotoxicity Screening in Rats
via Whole-Body Inhalation Exposures
Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice	SEX: Female	ANIMAL: 2502
PHASE DAY OF DEATH: 29	PHASE: Dosing phase	GROUP: 2

Tissue	Gross Observations/Comments	Microscopic Observations/Comments

Tissues without comment under Gross Observations were within normal limits at necropsy.
The following tissues were unremarkable microscopically:
No tissues examined.

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Huntingdon Life Sciences, Inc. 034245

Propane: Combined Repeated-Exposure Toxicity,
Reproduction and Neurotoxicity Screening in Rats
via Whole-Body Inhalation Exposures
Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice	SEX: Female	ANIMAL: 2503
PHASE DAY OF DEATH: 29	PHASE: Dosing phase	GROUP: 2

Tissue	Gross Observations/Comments	Microscopic Observations/Comments

Tissues without comment under Gross Observations were within normal limits at necropsy.
The following tissues were unremarkable microscopically:
No tissues examined.

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Propane: Combined Repeated-Exposure Toxicity,
Reproduction and Neurotoxicity Screening in Rats
via Whole-Body Inhalation Exposures
Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice	SEX: Female	ANIMAL: 2504
PHASE DAY OF DEATH: 29	PHASE: Dosing phase	GROUP: 2

Tissue	Gross Observations/Comments	Microscopic Observations/Comments
Spleen	Irregular Shape, Slight	No micropathology observations on tissue.

Tissues without comment under Gross Observations were within normal limits at necropsy.
The following tissues were unremarkable microscopically:
No tissues examined.

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Huntingdon Life Sciences, Inc. 034245

Propane: Combined Repeated-Exposure Toxicity,
Reproduction and Neurotoxicity Screening in Rats
via Whole-Body Inhalation Exposures
Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice	SEX: Female	ANIMAL: 2505
PHASE DAY OF DEATH: 29	PHASE: Dosing phase	GROUP: 2

Tissue	Gross Observations/Comments	Microscopic Observations/Comments

Tissues without comment under Gross Observations were within normal limits at necropsy.
The following tissues were unremarkable microscopically:
No tissues examined.

14-Apr-10; 18:47
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Propane: Combined Repeated-Exposure Toxicity,
Reproduction and Neurotoxicity Screening in Rats
via Whole-Body Inhalation Exposures
Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice	SEX: Female	ANIMAL: 2506
PHASE DAY OF DEATH: 29	PHASE: Dosing phase	GROUP: 2

Tissue	Gross Observations/Comments	Microscopic Observations/Comments

Tissues without comment under Gross Observations were within normal limits at necropsy.
The following tissues were unremarkable microscopically:
No tissues examined.

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Propane: Combined Repeated-Exposure Toxicity,
Reproduction and Neurotoxicity Screening in Rats
via Whole-Body Inhalation Exposures
Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice	SEX: Female	ANIMAL: 2507
PHASE DAY OF DEATH: 30	PHASE: Dosing phase	GROUP: 2

Tissue	Gross Observations/Comments	Microscopic Observations/Comments

Tissues without comment under Gross Observations were within normal limits at necropsy.
The following tissues were unremarkable microscopically:
No tissues examined.

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Propane: Combined Repeated-Exposure Toxicity,
Reproduction and Neurotoxicity Screening in Rats
via Whole-Body Inhalation Exposures
Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice	SEX: Female	ANIMAL: 2508
PHASE DAY OF DEATH: 30	PHASE: Dosing phase	GROUP: 2

Tissue	Gross Observations/Comments	Microscopic Observations/Comments

Tissues without comment under Gross Observations were within normal limits at necropsy.
The following tissues were unremarkable microscopically:
No tissues examined.

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Propane: Combined Repeated-Exposure Toxicity,
Reproduction and Neurotoxicity Screening in Rats
via Whole-Body Inhalation Exposures
Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice	SEX: Female	ANIMAL: 2509
PHASE DAY OF DEATH: 30	PHASE: Dosing phase	GROUP: 2

Tissue	Gross Observations/Comments	Microscopic Observations/Comments

Tissues without comment under Gross Observations were within normal limits at necropsy.
The following tissues were unremarkable microscopically:
No tissues examined.

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Huntingdon Life Sciences, Inc. 034245

Propane: Combined Repeated-Exposure Toxicity,
Reproduction and Neurotoxicity Screening in Rats
via Whole-Body Inhalation Exposures
Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice	SEX: Female	ANIMAL: 2510
PHASE DAY OF DEATH: 30	PHASE: Dosing phase	GROUP: 2

Tissue	Gross Observations/Comments	Microscopic Observations/Comments

Tissues without comment under Gross Observations were within normal limits at necropsy.
The following tissues were unremarkable microscopically:
No tissues examined.

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Propane: Combined Repeated-Exposure Toxicity,
Reproduction and Neurotoxicity Screening in Rats
via Whole-Body Inhalation Exposures
Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice	SEX: Female	ANIMAL: 2511
PHASE DAY OF DEATH: 30	PHASE: Dosing phase	GROUP: 2

Tissue	Gross Observations/Comments	Microscopic Observations/Comments

Tissues without comment under Gross Observations were within normal limits at necropsy.
The following tissues were unremarkable microscopically:
No tissues examined.

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Propane: Combined Repeated-Exposure Toxicity,
Reproduction and Neurotoxicity Screening in Rats
via Whole-Body Inhalation Exposures
Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice	SEX: Female	ANIMAL: 2512
PHASE DAY OF DEATH: 30	PHASE: Dosing phase	GROUP: 2

Tissue	Gross Observations/Comments	Microscopic Observations/Comments

Tissues without comment under Gross Observations were within normal limits at necropsy.
The following tissues were unremarkable microscopically:
No tissues examined.

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Propane: Combined Repeated-Exposure Toxicity,
Reproduction and Neurotoxicity Screening in Rats
via Whole-Body Inhalation Exposures
Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice	SEX: Female	ANIMAL: 3501
PHASE DAY OF DEATH: 29	PHASE: Dosing phase	GROUP: 3

Tissue	Gross Observations/Comments	Microscopic Observations/Comments

Tissues without comment under Gross Observations were within normal limits at necropsy.
The following tissues were unremarkable microscopically:
No tissues examined.

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Propane: Combined Repeated-Exposure Toxicity,
Reproduction and Neurotoxicity Screening in Rats
via Whole-Body Inhalation Exposures
Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice	SEX: Female	ANIMAL: 3502
PHASE DAY OF DEATH: 29	PHASE: Dosing phase	GROUP: 3

Tissue	Gross Observations/Comments	Microscopic Observations/Comments

Tissues without comment under Gross Observations were within normal limits at necropsy.
The following tissues were unremarkable microscopically:
No tissues examined.

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Propane: Combined Repeated-Exposure Toxicity,
Reproduction and Neurotoxicity Screening in Rats
via Whole-Body Inhalation Exposures
Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice	SEX: Female	ANIMAL: 3503
PHASE DAY OF DEATH: 29	PHASE: Dosing phase	GROUP: 3

Tissue	Gross Observations/Comments	Microscopic Observations/Comments

Tissues without comment under Gross Observations were within normal limits at necropsy.
The following tissues were unremarkable microscopically:
No tissues examined.

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Propane: Combined Repeated-Exposure Toxicity,
Reproduction and Neurotoxicity Screening in Rats
via Whole-Body Inhalation Exposures
Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice	SEX: Female	ANIMAL: 3504
PHASE DAY OF DEATH: 29	PHASE: Dosing phase	GROUP: 3

Tissue	Gross Observations/Comments	Microscopic Observations/Comments
Kidneys	Dilated Pelvis, Right, Moderate Dilated Pelvis, Left, Slight	No micropathology observations on tissue.

Tissues without comment under Gross Observations were within normal limits at necropsy.
The following tissues were unremarkable microscopically:
No tissues examined.

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Propane: Combined Repeated-Exposure Toxicity,
Reproduction and Neurotoxicity Screening in Rats
via Whole-Body Inhalation Exposures
Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice	SEX: Female	ANIMAL: 3505
PHASE DAY OF DEATH: 29	PHASE: Dosing phase	GROUP: 3

Tissue	Gross Observations/Comments	Microscopic Observations/Comments

Tissues without comment under Gross Observations were within normal limits at necropsy.
The following tissues were unremarkable microscopically:
No tissues examined.

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Propane: Combined Repeated-Exposure Toxicity,
Reproduction and Neurotoxicity Screening in Rats
via Whole-Body Inhalation Exposures
Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice	SEX: Female	ANIMAL: 3506
PHASE DAY OF DEATH: 29	PHASE: Dosing phase	GROUP: 3

Tissue	Gross Observations/Comments	Microscopic Observations/Comments

Tissues without comment under Gross Observations were within normal limits at necropsy.
The following tissues were unremarkable microscopically:
No tissues examined.

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Huntingdon Life Sciences, Inc. 034245

Propane: Combined Repeated-Exposure Toxicity,
Reproduction and Neurotoxicity Screening in Rats
via Whole-Body Inhalation Exposures
Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice	SEX: Female	ANIMAL: 3507
PHASE DAY OF DEATH: 30	PHASE: Dosing phase	GROUP: 3

Tissue	Gross Observations/Comments	Microscopic Observations/Comments

Tissues without comment under Gross Observations were within normal limits at necropsy.
The following tissues were unremarkable microscopically:
No tissues examined.

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Huntingdon Life Sciences, Inc. 034245

Propane: Combined Repeated-Exposure Toxicity,
Reproduction and Neurotoxicity Screening in Rats
via Whole-Body Inhalation Exposures
Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice	SEX: Female	ANIMAL: 3508
PHASE DAY OF DEATH: 30	PHASE: Dosing phase	GROUP: 3

Tissue	Gross Observations/Comments	Microscopic Observations/Comments
Lungs	Discolored, All lobes, Red, Foci, </= 0.1 cm, Moderate	No micropathology observations on tissue.
Thymus	Discolored, Red, Foci, </= 0.1 cm, Slight	No micropathology observations on tissue.
Uterus	Distended, Bilateral horns, Moderate	No micropathology observations on tissue.

Tissues without comment under Gross Observations were within normal limits at necropsy.
The following tissues were unremarkable microscopically:
No tissues examined.

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Huntingdon Life Sciences, Inc. 034245

Propane: Combined Repeated-Exposure Toxicity,
Reproduction and Neurotoxicity Screening in Rats
via Whole-Body Inhalation Exposures
Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice	SEX: Female	ANIMAL: 3509
PHASE DAY OF DEATH: 30	PHASE: Dosing phase	GROUP: 3

Tissue	Gross Observations/Comments	Microscopic Observations/Comments

Tissues without comment under Gross Observations were within normal limits at necropsy.
The following tissues were unremarkable microscopically:
No tissues examined.

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Huntingdon Life Sciences, Inc. 034245

Propane: Combined Repeated-Exposure Toxicity,
Reproduction and Neurotoxicity Screening in Rats
via Whole-Body Inhalation Exposures
Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice	SEX: Female	ANIMAL: 3510
PHASE DAY OF DEATH: 30	PHASE: Dosing phase	GROUP: 3

Tissue	Gross Observations/Comments	Microscopic Observations/Comments
Uterus	Distended, Bilateral horns, Moderate	No micropathology observations on tissue.

Tissues without comment under Gross Observations were within normal limits at necropsy.
The following tissues were unremarkable microscopically:
No tissues examined.

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Huntingdon Life Sciences, Inc. 034245

Propane: Combined Repeated-Exposure Toxicity,
Reproduction and Neurotoxicity Screening in Rats
via Whole-Body Inhalation Exposures
Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice	SEX: Female	ANIMAL: 3511
PHASE DAY OF DEATH: 30	PHASE: Dosing phase	GROUP: 3

Tissue	Gross Observations/Comments	Microscopic Observations/Comments

Tissues without comment under Gross Observations were within normal limits at necropsy.
The following tissues were unremarkable microscopically:
No tissues examined.

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Propane: Combined Repeated-Exposure Toxicity,
Reproduction and Neurotoxicity Screening in Rats
via Whole-Body Inhalation Exposures
Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice	SEX: Female	ANIMAL: 3512
PHASE DAY OF DEATH: 30	PHASE: Dosing phase	GROUP: 3

Tissue	Gross Observations/Comments	Microscopic Observations/Comments

Tissues without comment under Gross Observations were within normal limits at necropsy.
The following tissues were unremarkable microscopically:
No tissues examined.

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Propane: Combined Repeated-Exposure Toxicity,
Reproduction and Neurotoxicity Screening in Rats
via Whole-Body Inhalation Exposures
Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice | SEX: Female | ANIMAL: 4501
PHASE DAY OF DEATH: 29 | PHASE: Dosing phase | GROUP: 4

Tissue	Gross Observations/Comments	Microscopic Observations/Comments
Heart	No gross observations on tissue.	SUBACUTE/CHRONIC INFLAMMATORY CELL INFILTRATE, Minimal.
Mesenteric LN	No gross observations on tissue.	CORTICAL LYMPHOCYTES/UNIT AREA, Multifocal, Moderate. PARACORTICAL LYMPHOCYTES/UNIT AREA, Moderate. FOLLICULAR GERMINAL CENTER DEVELOPMENT, Multifocal, Moderate. PROMINENT HISTIOCYTES, Multifocal, Minimal.
Mediastinal LN	No gross observations on tissue.	CORTICAL LYMPHOCYTES/UNIT AREA, Slight. PARACORTICAL LYMPHOCYTES/UNIT AREA, Moderate. FOLLICULAR GERMINAL CENTER DEVELOPMENT, Multifocal, Slight. FREE ERYTHROCYTES/ERYTHROPHAGOCYTOSIS, Multifocal, Minimal. PROMINENT PLASMA CELLS, Multifocal, Minimal.
Lungs	No gross observations on tissue.	ALVEOLAR/INTRAALVEOLAR MACROPHAGES, Multifocal, Minimal. VESSEL MINERALIZATION, Multifocal, Minimal.

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Propane: Combined Repeated-Exposure Toxicity,
Reproduction and Neurotoxicity Screening in Rats
via Whole-Body Inhalation Exposures
Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice | SEX: Female | ANIMAL: 4501
PHASE DAY OF DEATH: 29 | PHASE: Dosing phase | GROUP: 4

Tissue	Gross Observations/Comments	Microscopic Observations/Comments
Mammary-protocol	No gross observations on tissue.	FEMALE TYPE (DIFFERENTIATED TYPE), Present.
Parathyroid	No gross observations on tissue.	Tissue is unremarkable; one-of-pair missing.
Thyroid	No gross observations on tissue.	ULTIMOBRANCHIAL REST(S), UNILATERAL, Focal, Minimal.
Thymus	No gross observations on tissue.	INVOLUTION/CORTICAL LYMPHOCYTOSIS, Minimal. HEMORRHAGE, Multifocal, Minimal.

Tissues without comment under Gross Observations were within normal limits at necropsy.
The following tissues were unremarkable microscopically:

Adrenal Glands	Sternal Marrow	Femoral Marrow	Brain	Sternum
Femur	Cecum	Colon	Duodenum	Ileum
Jejunum	Kidneys	Liver	Tibial Nerve	Oviducts/Fallop
Ovaries	Rectum/Low Colon	Cervical SC	Thoracic SC	Lumbar SC
Skin-protocol	Spleen	Stomach	Trachea	Urinary bladder
Uterus	Vagina			

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Propane: Combined Repeated-Exposure Toxicity,
Reproduction and Neurotoxicity Screening in Rats
via Whole-Body Inhalation Exposures
Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice | SEX: Female | ANIMAL: 4502
PHASE DAY OF DEATH: 29 | PHASE: Dosing phase | GROUP: 4

Tissue	Gross Observations/Comments	Microscopic Observations/Comments
Mesenteric LN	No gross observations on tissue.	CORTICAL LYMPHOCYTES/UNIT AREA, Slight. PARACORTICAL LYMPHOCYTES/UNIT AREA, Moderate. FOLLICULAR GERMINAL CENTER DEVELOPMENT, Multifocal, Moderate. PROMINENT HISTIOCYTES, Multifocal, Minimal.
Mediastinal LN	No gross observations on tissue.	CORTICAL LYMPHOCYTES/UNIT AREA, Slight. PARACORTICAL LYMPHOCYTES/UNIT AREA, Moderate. FOLLICULAR GERMINAL CENTER DEVELOPMENT, Multifocal, Slight. FREE ERYTHROCYTES/ERYTHROPHAGOCYTOSIS, Multifocal, Minimal. PROMINENT PLASMA CELLS, Multifocal, Minimal.
Lungs	No gross observations on tissue.	ALVEOLAR/INTRAALVEOLAR MACROPHAGES, Multifocal, Minimal. VESSEL MINERALIZATION, Multifocal, Minimal.
Mammary-protocol	No gross observations on tissue.	FEMALE TYPE (DIFFERENTIATED TYPE), Present.

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Propane: Combined Repeated-Exposure Toxicity,
Reproduction and Neurotoxicity Screening in Rats
via Whole-Body Inhalation Exposures
Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice	SEX: Female	ANIMAL: 4502
PHASE DAY OF DEATH: 29	PHASE: Dosing phase	GROUP: 4

Tissue	Gross Observations/Comments	Microscopic Observations/Comments
Parathyroid	No gross observations on tissue.	Tissue is missing. - TISSUE MISSING FROM SLIDE
Skin-protocol	No gross observations on tissue.	FOLLICULAR DILATATION/HAIR FOLLICLES: EMPTY/WITHOUT HAIRSHAFT, Multifocal, Minimal.
Thyroid	No gross observations on tissue.	One-of-pair missing. ULTIMOBRANCHIAL REST(S), UNILATERAL, Minimal.
Thymus	No gross observations on tissue.	INVOLUTION/CORTICAL LYMPHOCYTOSIS, Minimal.
Trachea	No gross observations on tissue.	Tissue is unremarkable (with comment). - INSUFFICIENT TISSUE PRESENT: RECUT, NO IMPROVEMENT.

Tissues without comment under Gross Observations were within normal limits at necropsy.
The following tissues were unremarkable microscopically:

Adrenal Glands	Sternal Marrow	Femoral Marrow	Brain	Sternum
Femur	Cecum	Colon	Duodenum	Heart
Ileum	Jejunum	Kidneys	Liver	Tibial Nerve

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Propane: Combined Repeated-Exposure Toxicity,
Reproduction and Neurotoxicity Screening in Rats
via Whole-Body Inhalation Exposures
Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice	SEX: Female	ANIMAL: 4502
PHASE DAY OF DEATH: 29	PHASE: Dosing phase	GROUP: 4

Tissue	Gross Observations/Comments	Microscopic Observations/Comments		
Oviducts/Fallop	Ovaries	Rectum/Low Colon	Cervical SC	Thoracic SC
Lumbar SC	Spleen	Stomach	Urinary bladder	Uterus
Vagina				

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Propane: Combined Repeated-Exposure Toxicity,
Reproduction and Neurotoxicity Screening in Rats
via Whole-Body Inhalation Exposures
Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice | SEX: Female | ANIMAL: 4503
PHASE DAY OF DEATH: 29 | PHASE: Dosing phase | GROUP: 4

Tissue	Gross Observations/Comments	Microscopic Observations/Comments
Kidneys	No gross observations on tissue.	CORTEX/CORTICO-MEDULLARY JUNCTION: TUBULE(S) DILATED, UNILATERAL, Focal, Minimal. CORTEX/CORTICO-MEDULLARY JUNCTION: MINERAL DEPOSIT(S), UNILATERAL, Multifocal, Minimal.
Mesenteric LN	No gross observations on tissue.	CORTICAL LYMPHOCYTES/UNIT AREA, Slight. PARACORTICAL LYMPHOCYTES/UNIT AREA, Marked. FOLLICULAR GERMINAL CENTER DEVELOPMENT, Multifocal, Moderate. PROMINENT HISTIOCYTES, Multifocal, Minimal.
Mediastinal LN	No gross observations on tissue.	CORTICAL LYMPHOCYTES/UNIT AREA, Minimal. PARACORTICAL LYMPHOCYTES/UNIT AREA, Marked. FOLLICULAR GERMINAL CENTER DEVELOPMENT, Multifocal, Slight. FREE ERYTHROCYTES/ERYTHROPHAGOCYTOSIS, Multifocal, Minimal.
Lungs	No gross observations on tissue.	PERIALVEOLAR/PERIVASCULAR SUBACUTE/CHRONIC INFLAMMATORY CELL INFILTRATE, Multifocal, Minimal. ALVEOLAR/INTRAALVEOLAR MACROPHAGES, Multifocal, Minimal.

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Propane: Combined Repeated-Exposure Toxicity,
Reproduction and Neurotoxicity Screening in Rats
via Whole-Body Inhalation Exposures
Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice | SEX: Female | ANIMAL: 4503
PHASE DAY OF DEATH: 29 | PHASE: Dosing phase | GROUP: 4

Tissue	Gross Observations/Comments	Microscopic Observations/Comments
Lungs		ARTERIOLE: MEDIAL DEGENERATION WITH GRANULOMATOUS INFLAMMATORY CELL INFILTRATE, Focal, Slight.
Mammary-protocol	No gross observations on tissue.	FEMALE TYPE (DIFFERENTIATED TYPE), Present.
Tibial Nerve	No gross observations on tissue.	Tissue is unremarkable (with comment). - TISSUE IS FRAGMENTED, BUT READABLE.
Ovaries	No gross observations on tissue.	SERTOLIFORM CELLS, UNILATERAL, Minimal.
Cervical SC	No gross observations on tissue.	Tissue is unremarkable (with comment). - TISSUE IS FRAGMENTED, BUT READABLE.
Thoracic SC	No gross observations on tissue.	Tissue is unremarkable (with comment). - TISSUE IS FRAGMENTED, BUT READABLE.
Skin-protocol	No gross observations on tissue.	FOLLICULAR DILATATION/HAIR FOLLICLES: EMPTY/WITHOUT HAIRSHAFT, Focal, Minimal.
Thymus	No gross observations on tissue.	INVOLUTION/CORTICAL LYMPHOCYTOSIS, Minimal. HEMORRHAGE, Multifocal, Minimal.
Trachea	No gross observations on tissue.	SUBACUTE/CHRONIC INFLAMMATORY CELL INFILTRATE, Focal, Minimal.

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Propane: Combined Repeated-Exposure Toxicity,
Reproduction and Neurotoxicity Screening in Rats
via Whole-Body Inhalation Exposures
Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice	SEX: Female	ANIMAL: 4503
PHASE DAY OF DEATH: 29	PHASE: Dosing phase	GROUP: 4

Tissue	Gross Observations/Comments	Microscopic Observations/Comments
Urinary bladder	No gross observations on tissue.	Tissue is missing.

Tissues without comment under Gross Observations were within normal limits at necropsy.
The following tissues were unremarkable microscopically:

Adrenal Glands	Sternal Marrow	Femoral Marrow	Brain	Sternum
Femur	Cecum	Colon	Duodenum	Heart
Ileum	Jejunum	Liver	Oviducts/Fallop	Parathyroid
Rectum/Low Colon	Lumbar SC	Spleen	Stomach	Thyroid
Uterus	Vagina			

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Propane: Combined Repeated-Exposure Toxicity,
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via Whole-Body Inhalation Exposures
Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice | SEX: Female | ANIMAL: 4504
PHASE DAY OF DEATH: 29 | PHASE: Dosing phase | GROUP: 4

Tissue	Gross Observations/Comments	Microscopic Observations/Comments
Kidneys	No gross observations on tissue.	CORTEX/CORTICO-MEDULLARY JUNCTION: MINERAL DEPOSIT(S), BILATERAL, Multifocal, Minimal.
Liver	No gross observations on tissue.	SUBACUTE/CHRONIC INFLAMMATORY CELL FOCI, Multifocal, Minimal.
Mesenteric LN	No gross observations on tissue.	CORTICAL LYMPHOCYTES/UNIT AREA, Moderate. PARACORTICAL LYMPHOCYTES/UNIT AREA, Moderate. FOLLICULAR GERMINAL CENTER DEVELOPMENT, Multifocal, Slight.
Mediastinal LN	No gross observations on tissue.	CORTICAL LYMPHOCYTES/UNIT AREA, Slight. PARACORTICAL LYMPHOCYTES/UNIT AREA, Marked. FOLLICULAR GERMINAL CENTER DEVELOPMENT, Multifocal, Minimal. FREE ERYTHROCYTES/ERYTHROPHAGOCYTOSIS, Multifocal, Slight.
Lungs	No gross observations on tissue.	ALVEOLAR/INTRAALVEOLAR MACROPHAGES, Multifocal, Minimal. VESSEL MINERALIZATION, Multifocal, Minimal.

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Propane: Combined Repeated-Exposure Toxicity,
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via Whole-Body Inhalation Exposures
Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice | SEX: Female | ANIMAL: 4504
PHASE DAY OF DEATH: 29 | PHASE: Dosing phase | GROUP: 4

Tissue	Gross Observations/Comments	Microscopic Observations/Comments
Mammary-protocol	No gross observations on tissue.	FEMALE TYPE (DIFFERENTIATED TYPE), Present.
Skin-protocol	No gross observations on tissue.	DECREASE/FEW HAIR FOLLICLES/APPENDAGES, Multifocal, Slight.
Thymus	No gross observations on tissue.	INVOLUTION/CORTICAL LYMPHOCYTOSIS, Minimal. HEMORRHAGE, Multifocal, Minimal.

Tissues without comment under Gross Observations were within normal limits at necropsy.
The following tissues were unremarkable microscopically:

Adrenal Glands	Sternal Marrow	Femoral Marrow	Brain	Sternum
Femur	Cecum	Colon	Duodenum	Heart
Ileum	Jejunum	Tibial Nerve	Oviducts/Fallop	Ovaries
Parathyroid	Rectum/Low Colon	Cervical SC	Thoracic SC	Lumbar SC
Spleen	Stomach	Thyroid	Trachea	Urinary bladder
Uterus	Vagina			

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Propane: Combined Repeated-Exposure Toxicity,
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via Whole-Body Inhalation Exposures
Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice | SEX: Female | ANIMAL: 4505
PHASE DAY OF DEATH: 29 | PHASE: Dosing phase | GROUP: 4

Tissue	Gross Observations/Comments	Microscopic Observations/Comments
Heart	No gross observations on tissue.	SUBACUTE/CHRONIC INFLAMMATORY CELL INFILTRATE, Multifocal, Minimal.
Kidneys	No gross observations on tissue.	CORTEX/CORTICO-MEDULLARY JUNCTION: MINERAL DEPOSIT(S), UNILATERAL, Multifocal, Minimal.
Liver	No gross observations on tissue.	SUBACUTE/CHRONIC INFLAMMATORY CELL FOCI, Multifocal, Minimal.
Mesenteric LN	No gross observations on tissue.	CORTICAL LYMPHOCYTES/UNIT AREA, Slight. PARACORTICAL LYMPHOCYTES/UNIT AREA, Moderate. FOLLICULAR GERMINAL CENTER DEVELOPMENT, Multifocal, Moderate. PROMINENT HISTIOCYTES, Multifocal, Minimal.
Mediastinal LN	No gross observations on tissue.	CORTICAL LYMPHOCYTES/UNIT AREA, Multifocal, Minimal. PARACORTICAL LYMPHOCYTES/UNIT AREA, Moderate. FOLLICULAR GERMINAL CENTER DEVELOPMENT, Multifocal, Moderate. FREE ERYTHROCYTES/ERYTHROPHAGOCYTOSIS, Multifocal, Slight.

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Propane: Combined Repeated-Exposure Toxicity,
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via Whole-Body Inhalation Exposures
Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice	SEX: Female	ANIMAL: 4505
PHASE DAY OF DEATH: 29	PHASE: Dosing phase	GROUP: 4

Tissue	Gross Observations/Comments	Microscopic Observations/Comments
Mediastinal LN		PROMINENT PLASMA CELLS, Multifocal, Minimal.
Lungs	No gross observations on tissue.	ALVEOLAR/INTRAALVEOLAR MACROPHAGES, Multifocal, Minimal. VESSEL MINERALIZATION, Multifocal, Minimal. PLEURAL MESENTERY: MINERALIZATION, Focal, Slight. - LOBES ARE PARTIALLY ATELECTATIC
Mammary-protocol . . .	No gross observations on tissue.	FEMALE TYPE (DIFFERENTIATED TYPE), Present.
Parathyroid	No gross observations on tissue.	Tissue is missing.
Thoracic SC	No gross observations on tissue.	Tissue is unremarkable (with comment). - TISSUE IS FRAGMENTED, BUT READABLE.
Skin-protocol	No gross observations on tissue.	FOLLICULAR DILATATION/HAIR FOLLICLES: EMPTY/WITHOUT HAIRSHAFT, Multifocal, Minimal.
Thyroid	No gross observations on tissue.	THYMIC ECTOPIC TISSUE, UNILATERAL, Focal, Minimal.
Thymus	No gross observations on tissue.	INVOLUTION/CORTICAL LYMPHOCYTOSIS, Minimal. HEMORRHAGE, Multifocal, Minimal.

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Propane: Combined Repeated-Exposure Toxicity,
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via Whole-Body Inhalation Exposures
Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice	SEX: Female	ANIMAL: 4505
PHASE DAY OF DEATH: 29	PHASE: Dosing phase	GROUP: 4

Tissue	Gross Observations/Comments	Microscopic Observations/Comments

Tissues without comment under Gross Observations were within normal limits at necropsy.
The following tissues were unremarkable microscopically:

Adrenal Glands	Sternal Marrow	Femoral Marrow	Brain	Sternum
Femur	Cecum	Colon	Duodenum	Ileum
Jejunum	Tibial Nerve	Oviducts/Fallop	Ovaries	Rectum/Low Colon
Cervical SC	Lumbar SC	Spleen	Stomach	Trachea
Urinary bladder	Uterus	Vagina		

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Propane: Combined Repeated-Exposure Toxicity,
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Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice	SEX: Female	ANIMAL: 4506
PHASE DAY OF DEATH: 29	PHASE: Dosing phase	GROUP: 4

Tissue	Gross Observations/Comments	Microscopic Observations/Comments
Kidneys	No gross observations on tissue.	CORTICAL TUBULAR DILATATION, UNILATERAL, Focal, Minimal.
Mesenteric LN	No gross observations on tissue.	CORTICAL LYMPHOCYTES/UNIT AREA, Slight. PARACORTICAL LYMPHOCYTES/UNIT AREA, Moderate. FOLLICULAR GERMINAL CENTER DEVELOPMENT, Multifocal, Moderate. PROMINENT PLASMA CELLS, Multifocal, Slight.
Mediastinal LN	No gross observations on tissue.	CORTICAL LYMPHOCYTES/UNIT AREA, Minimal. PARACORTICAL LYMPHOCYTES/UNIT AREA, Moderate. FOLLICULAR GERMINAL CENTER DEVELOPMENT, Multifocal, Slight. FREE ERYTHROCYTES/ERYTHROPHAGOCYTOSIS, Multifocal, Slight. BROWN PIGMENT, Multifocal, Slight.
Lungs	No gross observations on tissue.	ALVEOLAR/INTRAALVEOLAR MACROPHAGES, Multifocal, Minimal. - LOBES ARE PARTIALLY ATELECTATIC

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Propane: Combined Repeated-Exposure Toxicity,
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Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice | SEX: Female | ANIMAL: 4506
PHASE DAY OF DEATH: 29 | PHASE: Dosing phase | GROUP: 4

Tissue	Gross Observations/Comments	Microscopic Observations/Comments
Mammary-protocol . . .	No gross observations on tissue.	FEMALE TYPE (DIFFERENTIATED TYPE), Present.
Ovaries	No gross observations on tissue.	SERTOLIFORM CELLS, UNILATERAL, Focal, Slight.
Parathyroid	No gross observations on tissue.	No micropathology observations on tissue; one-of-pair missing.
Thoracic SC	No gross observations on tissue.	Tissue is unremarkable (with comment). - TISSUE IS FRAGMENTED, BUT READABLE.
Skin-protocol	No gross observations on tissue.	FOLLICULAR DILATATION/HAIR FOLLICLES: EMPTY/WITHOUT HAIRSHAFT, Multifocal, Minimal.
Skin (other)	Hair Thin/Absent, Forepaw(s), Severe/ Both	Examined; 2 correlations found: HYPERKERATOSIS WITH ENCRUSTATION, Focal, Slight. HAIR FOLLICLE: MATRIX/PAPILLA/SHAFT DEGENERATION/NECROSIS, Multifocal, Slight.
Thymus	No gross observations on tissue.	INVOLUTION/CORTICAL LYMPHOCYTOSIS, Minimal.
Uterus	No gross observations on tissue.	LUMINAL DILATATION, BILATERAL, Moderate.

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Propane: Combined Repeated-Exposure Toxicity,
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Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice | SEX: Female | ANIMAL: 4506
PHASE DAY OF DEATH: 29 | PHASE: Dosing phase | GROUP: 4

Tissue | Gross Observations/Comments | Microscopic Observations/Comments

Tissues without comment under Gross Observations were within normal limits at necropsy.
The following tissues were unremarkable microscopically:

Adrenal Glands	Sternal Marrow	Femoral Marrow	Brain	Sternum
Femur	Cecum	Colon	Duodenum	Heart
Ileum	Jejunum	Liver	Tibial Nerve	Oviducts/Fallop
Rectum/Low Colon	Cervical SC	Lumbar SC	Spleen	Stomach
Thyroid	Trachea	Urinary bladder	Vagina	

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Propane: Combined Repeated-Exposure Toxicity,
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via Whole-Body Inhalation Exposures
Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice	SEX: Female	ANIMAL: 4507
PHASE DAY OF DEATH: 30	PHASE: Dosing phase	GROUP: 4

Tissue	Gross Observations/Comments	Microscopic Observations/Comments
Brain	No gross observations on tissue.	Tissue is unremarkable (with comment). - TISSUE IS FRAGMENTED, BUT READABLE.
Heart	No gross observations on tissue.	SUBACUTE/CHRONIC INFLAMMATORY CELL INFILTRATE, Multifocal, Minimal.
Kidneys	No gross observations on tissue.	CORTEX/CORTICO-MEDULLARY JUNCTION: MINERAL DEPOSIT(S), BILATERAL, Multifocal, Minimal. MEDULLA: MINERAL DEPOSIT(S), UNILATERAL, Focal, Minimal.
Liver	No gross observations on tissue.	SUBACUTE/CHRONIC INFLAMMATORY CELL FOCI, Minimal.
Mesenteric LN	No gross observations on tissue.	CORTICAL LYMPHOCYTES/UNIT AREA, Slight. PARACORTICAL LYMPHOCYTES/UNIT AREA, Moderate. FOLLICULAR GERMINAL CENTER DEVELOPMENT, Multifocal, Moderate. PROMINENT PLASMA CELLS, Multifocal, Minimal.
Mediastinal LN	No gross observations on tissue.	CORTICAL LYMPHOCYTES/UNIT AREA, Minimal. PARACORTICAL LYMPHOCYTES/UNIT AREA, Marked.

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Propane: Combined Repeated-Exposure Toxicity,
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via Whole-Body Inhalation Exposures
Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice		SEX: Female	ANIMAL: 4507
PHASE DAY OF DEATH: 30		PHASE: Dosing phase	GROUP: 4
Tissue	Gross Observations/Comments	Microscopic Observations/Comments	
Mediastinal LN		FOLLICULAR GERMINAL CENTER DEVELOPMENT, Multifocal, Minimal. FREE ERYTHROCYTES/ERYTHROPHAGOCYTOSIS, Multifocal, Slight.	
Lungs	Discolored, All lobes, Red, Foci, 0.2 - 0.5 cm		
		PERIALVEOLAR/PERIVASCULAR SUBACUTE/CHRONIC INFLAMMATORY CELL INFILTRATE, Multifocal, Minimal. ALVEOLAR/INTRAALVEOLAR MACROPHAGES, Multifocal, Minimal. VESSEL MINERALIZATION, Multifocal, Minimal. - LOBES ARE PARTIALLY ATELECTATIC.	
Mammary-protocol . . .	No gross observations on tissue.	FEMALE TYPE (DIFFERENTIATED TYPE), Present.	
Parathyroid	No gross observations on tissue.	No micropathology observations on tissue; one-of-pair missing.	
Cervical SC	No gross observations on tissue.	Tissue is unremarkable (with comment). - TISSUE IS FRAGMENTED, BUT READABLE.	
Thoracic SC	No gross observations on tissue.	Tissue is unremarkable (with comment). - TISSUE IS FRAGMENTED, BUT READABLE.	

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Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice | SEX: Female | ANIMAL: 4507
PHASE DAY OF DEATH: 30 | PHASE: Dosing phase | GROUP: 4

Tissue	Gross Observations/Comments	Microscopic Observations/Comments
Lumbar SC	No gross observations on tissue.	Tissue is unremarkable (with comment). - TISSUE IS FRAGMENTED, BUT READABLE.
Thyroid	No gross observations on tissue.	THYMIC ECTOPIC TISSUE, UNILATERAL, Focal, Minimal. ULTIMOBRANCHIAL REST(S), BILATERAL, Minimal.
Thymus	No gross observations on tissue.	INVOLUTION/CORTICAL LYMPHOCYTOSIS, Minimal.
Uterus	Distended, Bilateral horns, Slight	Examined; 1 correlation found: LUMINAL DILATATION, BILATERAL, Moderate.

Tissues without comment under Gross Observations were within normal limits at necropsy.
The following tissues were unremarkable microscopically:

Adrenal Glands	Sternal Marrow	Femoral Marrow	Sternum	Femur
Cecum	Colon	Duodenum	Ileum	Jejunum
Tibial Nerve	Oviducts/Fallop	Ovaries	Rectum/Low Colon	Skin-protocol
Spleen	Stomach	Trachea	Urinary bladder	Vagina

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Propane: Combined Repeated-Exposure Toxicity,
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via Whole-Body Inhalation Exposures
Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice	SEX: Female	ANIMAL: 4508
PHASE DAY OF DEATH: 30	PHASE: Dosing phase	GROUP: 4

Tissue	Gross Observations/Comments	Microscopic Observations/Comments
Brain	No gross observations on tissue.	Tissue is unremarkable (with comment). - TISSUE IS FRAGMENTED, BUT READABLE.
Kidneys	No gross observations on tissue.	CORTEX/CORTICO-MEDULLARY JUNCTION: MINERAL DEPOSIT(S), BILATERAL, Minimal.
Liver	No gross observations on tissue.	SUBACUTE/CHRONIC INFLAMMATORY CELL FOCI, Multifocal, Minimal.
Mesenteric LN	No gross observations on tissue.	CORTICAL LYMPHOCYTES/UNIT AREA, Slight. PARACORTICAL LYMPHOCYTES/UNIT AREA, Moderate. FOLLICULAR GERMINAL CENTER DEVELOPMENT, Multifocal, Moderate. PROMINENT HISTIOCYTES, Multifocal, Minimal. PROMINENT PLASMA CELLS, Multifocal, Slight.
Mediastinal LN	No gross observations on tissue.	CORTICAL LYMPHOCYTES/UNIT AREA, Minimal. PARACORTICAL LYMPHOCYTES/UNIT AREA, Moderate. FREE ERYTHROCYTES/ERYTHROPHAGOCYTOSIS, Multifocal, Minimal. PROMINENT HISTIOCYTES, Minimal.

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Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice | SEX: Female | ANIMAL: 4508
PHASE DAY OF DEATH: 30 | PHASE: Dosing phase | GROUP: 4

Tissue	Gross Observations/Comments	Microscopic Observations/Comments
Lungs	No gross observations on tissue.	ALVEOLAR/INTRAALVEOLAR MACROPHAGES, Multifocal, Minimal. VESSEL MINERALIZATION, Multifocal, Minimal. - LOBES ARE PARTIALLY ATELECTATIC.
Mammary-protocol	No gross observations on tissue.	FEMALE TYPE (DIFFERENTIATED TYPE), Present.
Ovaries	No gross observations on tissue.	MINERALIZATION, UNILATERAL, Focal, Minimal.
Thyroid	No gross observations on tissue.	ULTIMOBRANCHIAL REST(S), UNILATERAL, Focal, Slight.
Thymus	No gross observations on tissue.	INVOLUTION/CORTICAL LYMPHOCYTOSIS, Minimal. HEMORRHAGE, Multifocal, Minimal.

Tissues without comment under Gross Observations were within normal limits at necropsy.
The following tissues were unremarkable microscopically:
Adrenal Glands Sternal Marrow Femoral Marrow Sternum Femur

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Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice | SEX: Female | ANIMAL: 4508
PHASE DAY OF DEATH: 30 | PHASE: Dosing phase | GROUP: 4

Tissue	Gross Observations/Comments		Microscopic Observations/Comments	
Cecum	Colon	Duodenum	Heart	Ileum
Jejunum	Tibial Nerve	Oviducts/Fallop	Parathyroid	Rectum/Low Colon
Cervical SC	Thoracic SC	Lumbar SC	Skin-protocol	Spleen
Stomach	Trachea	Urinary bladder	Uterus	Vagina

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Propane: Combined Repeated-Exposure Toxicity,
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Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice	SEX: Female	ANIMAL: 4509
PHASE DAY OF DEATH: 30	PHASE: Dosing phase	GROUP: 4

Tissue	Gross Observations/Comments	Microscopic Observations/Comments
Liver	No gross observations on tissue.	SUBACUTE/CHRONIC INFLAMMATORY CELL FOCI, Multifocal, Minimal.
Mesenteric LN	No gross observations on tissue.	CORTICAL LYMPHOCYTES/UNIT AREA, Moderate. PARACORTICAL LYMPHOCYTES/UNIT AREA, Marked. FOLLICULAR GERMINAL CENTER DEVELOPMENT, Moderate. PROMINENT HISTIOCYTES, Minimal.
Mediastinal LN	No gross observations on tissue.	Tissue is missing. - INSUFFICIENT TISSUE PRESENT.
Lungs	No gross observations on tissue.	PERIALVEOLAR/PERIVASCULAR SUBACUTE/CHRONIC INFLAMMATORY CELL INFILTRATE, Multifocal, Minimal. ALVEOLAR/INTRAALVEOLAR MACROPHAGES, Multifocal, Minimal. FOAMY MACROPHAGES, Multifocal, Slight. VESSEL MINERALIZATION, Multifocal, Minimal. - LOBES ARE PARTIALLY ATELECTATIC.
Mammary-protocol	No gross observations on tissue.	FEMALE TYPE (DIFFERENTIATED TYPE), Present.

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Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice	SEX: Female	ANIMAL: 4509
PHASE DAY OF DEATH: 30	PHASE: Dosing phase	GROUP: 4

Tissue	Gross Observations/Comments	Microscopic Observations/Comments
Tibial Nerve	No gross observations on tissue.	Tissue is unremarkable (with comment). - TISSUE IS FRAGMENTED, BUT READABLE.
Skin-protocol	No gross observations on tissue.	DECREASE/FEW HAIR FOLLICLES/APPENDAGES, Multifocal, Slight. - SECTION ARTIFACT.
Thyroid	No gross observations on tissue.	ULTIMOBRANCHIAL REST(S), UNILATERAL, Focal, Minimal.
Thymus	No gross observations on tissue.	INVOLUTION/CORTICAL LYMPHOCYTOSIS, Multifocal, Minimal.
Uterus	No gross observations on tissue.	LUMINAL DILATATION, BILATERAL, Minimal.

Tissues without comment under Gross Observations were within normal limits at necropsy.
The following tissues were unremarkable microscopically:

Adrenal Glands	Sternal Marrow	Femoral Marrow	Brain	Sternum
Femur	Cecum	Colon	Duodenum	Heart
Ileum	Jejunum	Kidneys	Oviducts/Fallop	Ovaries

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STATUS: Final phase sacrifice	SEX: Female	ANIMAL: 4509
PHASE DAY OF DEATH: 30	PHASE: Dosing phase	GROUP: 4

Tissue	Gross Observations/Comments	Microscopic Observations/Comments		
Parathyroid	Rectum/Low Colon	Cervical SC	Thoracic SC	Lumbar SC
Spleen	Stomach	Trachea	Urinary bladder	Vagina

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Propane: Combined Repeated-Exposure Toxicity,
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Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice | SEX: Female | ANIMAL: 4510
PHASE DAY OF DEATH: 30 | PHASE: Dosing phase | GROUP: 4

Tissue	Gross Observations/Comments	Microscopic Observations/Comments
Adrenal Glands	No gross observations on tissue.	Tissue is unremarkable (with comment). - ONLY ONE MEDULLA PRESENT/EVALUATED.
Femoral Marrow	No gross observations on tissue.	MEDULLARY CYST(S), Slight.
Heart	No gross observations on tissue.	SUBACUTE/CHRONIC INFLAMMATORY CELL INFILTRATE, Multifocal, Minimal.
Kidneys	No gross observations on tissue.	CORTEX/CORTICO-MEDULLARY JUNCTION: MINERAL DEPOSIT(S), BILATERAL, Multifocal, Minimal.
Mesenteric LN	No gross observations on tissue.	CORTICAL LYMPHOCYTES/UNIT AREA, Moderate. PARACORTICAL LYMPHOCYTES/UNIT AREA, Moderate. FOLLICULAR GERMINAL CENTER DEVELOPMENT, Moderate.
Mediastinal LN	No gross observations on tissue.	CORTICAL LYMPHOCYTES/UNIT AREA, Minimal. PARACORTICAL LYMPHOCYTES/UNIT AREA, Moderate. FOLLICULAR GERMINAL CENTER DEVELOPMENT, Multifocal, Minimal. FREE ERYTHROCYTES/ERYTHROPHAGOCYTOSIS, Multifocal, Slight.

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Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice | SEX: Female | ANIMAL: 4510
PHASE DAY OF DEATH: 30 | PHASE: Dosing phase | GROUP: 4

Tissue	Gross Observations/Comments	Microscopic Observations/Comments
Lungs	No gross observations on tissue.	PERIALVEOLAR/PERIVASCULAR SUBACUTE/CHRONIC INFLAMMATORY CELL INFILTRATE, Multifocal, Minimal. ALVEOLAR/INTRAALVEOLAR MACROPHAGES, Multifocal, Minimal. - LOBES ARE PARTIALLY ATELECTATIC
Mammary-protocol	No gross observations on tissue.	FEMALE TYPE (DIFFERENTIATED TYPE), Present.
Parathyroid	No gross observations on tissue.	Tissue is unremarkable; one-of-pair missing.
Thyroid	No gross observations on tissue.	THYMIC ECTOPIC TISSUE, UNILATERAL, Focal, Minimal.
Thymus	No gross observations on tissue.	INVOLUTION/CORTICAL LYMPHOCYTOSIS, Minimal. HEMORRHAGE, Multifocal, Minimal.

Tissues without comment under Gross Observations were within normal limits at necropsy.
The following tissues were unremarkable microscopically:
Sternal Marrow Brain Sternum Femur Cecum

14-Apr-10; 18:47
Huntingdon Life Sciences, Inc. 034245

Propane: Combined Repeated-Exposure Toxicity,
Reproduction and Neurotoxicity Screening in Rats
via Whole-Body Inhalation Exposures
Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice | SEX: Female | ANIMAL: 4510
PHASE DAY OF DEATH: 30 | PHASE: Dosing phase | GROUP: 4

Tissue	Gross Observations/Comments	Microscopic Observations/Comments		
Colon	Duodenum	Ileum	Jejunum	Liver
Tibial Nerve	Oviducts/Fallop	Ovaries	Rectum/Low Colon	Cervical SC
Thoracic SC	Lumbar SC	Skin-protocol	Spleen	Stomach
Trachea	Urinary bladder	Uterus	Vagina	

14-Apr-10; 18:47
Huntingdon Life Sciences, Inc. 034245

Propane: Combined Repeated-Exposure Toxicity,
Reproduction and Neurotoxicity Screening in Rats
via Whole-Body Inhalation Exposures
Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice	SEX: Female	ANIMAL: 4511
PHASE DAY OF DEATH: 30	PHASE: Dosing phase	GROUP: 4

Tissue	Gross Observations/Comments	Microscopic Observations/Comments
Heart	No gross observations on tissue.	SUBACUTE/CHRONIC INFLAMMATORY CELL INFILTRATE, Multifocal, Minimal. - ONLY ONE AURICLE PRESENT/EVALUATED.
Kidneys	No gross observations on tissue.	CORTEX/CORTICO-MEDULLARY JUNCTION: MINERAL DEPOSIT(S), BILATERAL, Multifocal, Minimal.
Mesenteric LN	No gross observations on tissue.	CORTICAL LYMPHOCYTES/UNIT AREA, Minimal. PARACORTICAL LYMPHOCYTES/UNIT AREA, Marked. FOLLICULAR GERMINAL CENTER DEVELOPMENT, Multifocal, Moderate. PROMINENT HISTIOCYTES, Slight.
Mediastinal LN	No gross observations on tissue.	CORTICAL LYMPHOCYTES/UNIT AREA, Slight. PARACORTICAL LYMPHOCYTES/UNIT AREA, Marked. FREE ERYTHROCYTES/ERYTHROPHAGOCYTOSIS, Multifocal, Slight.
Lungs	No gross observations on tissue.	PERIALVEOLAR/PERIVASCULAR SUBACUTE/CHRONIC INFLAMMATORY CELL INFILTRATE, Multifocal, Slight. SUBACUTE/CHRONIC INFLAMMATORY CELL FOCI, Multifocal, Slight.

14-Apr-10; 18:47
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Propane: Combined Repeated-Exposure Toxicity,
Reproduction and Neurotoxicity Screening in Rats
via Whole-Body Inhalation Exposures
Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice	SEX: Female	ANIMAL: 4511
PHASE DAY OF DEATH: 30	PHASE: Dosing phase	GROUP: 4

Tissue	Gross Observations/Comments	Microscopic Observations/Comments
Lungs		ALVEOLAR/INTRAALVEOLAR MACROPHAGES, Multifocal, Minimal. VESSEL MINERALIZATION, Multifocal, Minimal. - LOBES ARE PARTIALLY ATELECTATIC.
Mammary-protocol . . .	No gross observations on tissue.	FEMALE TYPE (DIFFERENTIATED TYPE), Present.
Parathyroid	No gross observations on tissue.	Tissue is missing.
Thyroid	No gross observations on tissue.	ULTIMOBRANCHIAL REST(S), UNILATERAL, Focal, Minimal.
Thymus	No gross observations on tissue.	INVOLUTION/CORTICAL LYMPHOCYTOSIS, Minimal.
Uterus	No gross observations on tissue.	LUMINAL DILATATION, BILATERAL, Moderate.

Tissues without comment under Gross Observations were within normal limits at necropsy.
The following tissues were unremarkable microscopically:

Adrenal Glands	Sternal Marrow	Femoral Marrow	Brain	Sternum
Femur	Cecum	Colon	Duodenum	Ileum

14-Apr-10; 18:47
Huntingdon Life Sciences, Inc. 034245

Propane: Combined Repeated-Exposure Toxicity,
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via Whole-Body Inhalation Exposures
Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice | SEX: Female | ANIMAL: 4511
PHASE DAY OF DEATH: 30 | PHASE: Dosing phase | GROUP: 4

Tissue	Gross Observations/Comments				Microscopic Observations/Comments
	Jejunum	Liver	Tibial Nerve	Oviducts/Fallop	Ovaries
	Rectum/Low Colon	Cervical SC	Thoracic SC	Lumbar SC	Skin-protocol
	Skin (other)	Spleen	Stomach	Trachea	Urinary bladder
	Vagina				

14-Apr-10; 18:47
Huntingdon Life Sciences, Inc. 034245

Propane: Combined Repeated-Exposure Toxicity,
Reproduction and Neurotoxicity Screening in Rats
via Whole-Body Inhalation Exposures
Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice | SEX: Female | ANIMAL: 4512
PHASE DAY OF DEATH: 30 | PHASE: Dosing phase | GROUP: 4

Tissue	Gross Observations/Comments	Microscopic Observations/Comments
Heart	No gross observations on tissue.	SUBACUTE/CHRONIC INFLAMMATORY CELL INFILTRATE, Multifocal, Minimal.
Kidneys	No gross observations on tissue.	PELVIC DILATATION, UNILATERAL, Slight. CORTEX/CORTICO-MEDULLARY JUNCTION: MINERAL DEPOSIT(S), BILATERAL, Multifocal, Minimal.
Liver	No gross observations on tissue.	SUBACUTE/CHRONIC INFLAMMATORY CELL FOCI, Multifocal, Minimal.
Mesenteric LN	No gross observations on tissue.	CORTICAL LYMPHOCYTES/UNIT AREA, Moderate. PARACORTICAL LYMPHOCYTES/UNIT AREA, Marked. FOLLICULAR GERMINAL CENTER DEVELOPMENT, Multifocal, Moderate. FREE ERYTHROCYTES/ERYTHROPHAGOCYTOSIS, Multifocal, Minimal. PROMINENT HISTIOCYTES, Multifocal, Minimal. PROMINENT PLASMA CELLS, Multifocal, Minimal.
Mediastinal LN	No gross observations on tissue.	CORTICAL LYMPHOCYTES/UNIT AREA, Minimal. PARACORTICAL LYMPHOCYTES/UNIT AREA, Moderate.

14-Apr-10; 18:47
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Propane: Combined Repeated-Exposure Toxicity,
Reproduction and Neurotoxicity Screening in Rats
via Whole-Body Inhalation Exposures
Individual Animal Gross and Microscopic Observations

STATUS: Final phase sacrifice | SEX: Female | ANIMAL: 4512
PHASE DAY OF DEATH: 30 | PHASE: Dosing phase | GROUP: 4

Tissue	Gross Observations/Comments	Microscopic Observations/Comments
Mediastinal LN		FREE ERYTHROCYTES/ERYTHROPHAGOCYTOSIS, Multifocal, Minimal. PROMINENT HISTIOCYTES, Multifocal, Minimal.
Lungs	No gross observations on tissue.	ALVEOLAR/INTRAALVEOLAR MACROPHAGES, Multifocal, Minimal. VESSEL MINERALIZATION, Multifocal, Minimal. - LOBES ARE PARTIALLY ATELECTATIC.
Mammary-protocol . . .	No gross observations on tissue.	FEMALE TYPE (DIFFERENTIATED TYPE), Present.
Tibial Nerve	No gross observations on tissue.	Tissue is unremarkable (with comment). - TISSUE IS FRAGMENTED, BUT READABLE.
Parathyroid	No gross observations on tissue.	Tissue is missing. - TISSUE MISSING FROM SLIDE
Thymus	No gross observations on tissue.	INVOLUTION/CORTICAL LYMPHOCYTOSIS, Minimal.
Uterus	No gross observations on tissue.	LUMINAL DILATATION, BILATERAL, Minimal.

14-Apr-10; 18:47
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Propane: Combined Repeated-Exposure Toxicity,
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STATUS: Final phase sacrifice	SEX: Female	ANIMAL: 4512
PHASE DAY OF DEATH: 30	PHASE: Dosing phase	GROUP: 4

Tissue	Gross Observations/Comments	Microscopic Observations/Comments

Tissues without comment under Gross Observations were within normal limits at necropsy.
The following tissues were unremarkable microscopically:

Adrenal Glands	Sternal Marrow	Femoral Marrow	Brain	Sternum
Femur	Cecum	Colon	Duodenum	Ileum
Jejunum	Oviducts/Fallop	Ovaries	Rectum/Low Colon	Cervical SC
Thoracic SC	Lumbar SC	Skin-protocol	Spleen	Stomach
Thyroid	Trachea	Urinary bladder	Vagina	

Data Requirement

EPA OPPTS 870.3650
OECD 422

STUDY NO. 03-4245

PROPANE: COMBINED REPEATED-EXPOSURE TOXICITY WITH REPRODUCTION/DEVELOPMENTAL TOXICITY AND NEUROTOXICITY SCREENING IN RATS VIA WHOLE-BODY INHALATION EXPOSURES

Final Report

VOLUME II OF II

Author: [redacted]

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1220 L Street, Northwest
Washington, D.C. 20005-4070

Attn: [redacted]

Date: 23 April 2010

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APPENDIX M

PROPANE: COMBINED REPEATED-EXPOSURE TOXICITY, REPRODUCTION AND NEUROTOXICITY SCREENING IN RATS VIA WHOLE-BODY INHALATION EXPOSURES

INDIVIDUAL ANIMAL TERMINATION HISTORY

FEMALES GROUP 1 0 PPM

ANIMAL#	TYPE OF DEATH	DATE OF DEATH	STUDY DAY	PREGNANCY STATUS
1513	TERMINAL SACRIFICE	29-FEB-04	41	P
1514	TERMINAL SACRIFICE	3-MAR-04	44	P
1515	TERMINAL SACRIFICE	3-MAR-04	44	P
1516	TERMINAL SACRIFICE	3-MAR-04	44	P
1517	TERMINAL SACRIFICE	1-MAR-04	42	P
1518	TERMINAL SACRIFICE	2-MAR-04	43	P
1519	TERMINAL SACRIFICE	29-FEB-04	41	P
1520	TERMINAL SACRIFICE	1-MAR-04	42	P
1521	TERMINAL SACRIFICE	2-MAR-04	43	P
1522	TERMINAL SACRIFICE	3-MAR-04	44	P
1523	TERMINAL SACRIFICE	2-MAR-04	43	P
1524	TERMINAL SACRIFICE	28-FEB-04	40	P

NP-NOT PREGNANT, P-PREGNANT

APPENDIX M

PROPANE: COMBINED REPEATED-EXPOSURE TOXICITY, REPRODUCTION
AND NEUROTOXICITY SCREENING IN RATS VIA WHOLE-BODY
INHALATION EXPOSURES

INDIVIDUAL ANIMAL TERMINATION HISTORY

FEMALES GROUP 2 1200 PPM

ANIMAL#	TYPE OF DEATH	DATE OF DEATH	STUDY DAY	PREGNANCY STATUS
2513	TERMINAL SACRIFICE	13-MAR-04	54	NP
2514	TERMINAL SACRIFICE	6-MAR-04	47	P
2515	TERMINAL SACRIFICE	3-MAR-04	44	P
2516	TERMINAL SACRIFICE	1-MAR-04	42	P
2517	TERMINAL SACRIFICE	29-FEB-04	41	P
2518	TERMINAL SACRIFICE	29-FEB-04	41	P
2519	TERMINAL SACRIFICE	28-FEB-04	40	P
2520	TERMINAL SACRIFICE	13-MAR-04	54	P
2521	TERMINAL SACRIFICE	3-MAR-04	44	P
2522	TERMINAL SACRIFICE	3-MAR-04	44	P
2523	TERMINAL SACRIFICE	1-MAR-04	42	P
2524	TERMINAL SACRIFICE	3-MAR-04	44	P

NP-NOT PREGNANT, P-PREGNANT

APPENDIX M

PROPANE: COMBINED REPEATED-EXPOSURE TOXICITY, REPRODUCTION
AND NEUROTOXICITY SCREENING IN RATS VIA WHOLE-BODY
INHALATION EXPOSURES

INDIVIDUAL ANIMAL TERMINATION HISTORY

FEMALES GROUP 3 4000 PPM

ANIMAL#	TYPE OF DEATH	DATE OF DEATH	STUDY DAY	PREGNANCY STATUS
3513	TERMINAL SACRIFICE	2-MAR-04	43	P
3514	TERMINAL SACRIFICE	28-FEB-04	40	P
3515	TERMINAL SACRIFICE	2-MAR-04	43	P
3516	TERMINAL SACRIFICE	1-MAR-04	42	P
3517	TERMINAL SACRIFICE	28-FEB-04	40	P
3518	TERMINAL SACRIFICE	2-MAR-04	43	P
3519	TERMINAL SACRIFICE	29-FEB-04	41	P
3520	TERMINAL SACRIFICE	1-MAR-04	42	P
3521	TERMINAL SACRIFICE	3-MAR-04	44	P
3522	TERMINAL SACRIFICE	2-MAR-04	43	P
3523	TERMINAL SACRIFICE	29-FEB-04	41	P
3524	TERMINAL SACRIFICE	2-MAR-04	43	P

NP-NOT PREGNANT, P-PREGNANT

APPENDIX M

PROPANE: COMBINED REPEATED-EXPOSURE TOXICITY, REPRODUCTION
AND NEUROTOXICITY SCREENING IN RATS VIA WHOLE-BODY
INHALATION EXPOSURES

INDIVIDUAL ANIMAL TERMINATION HISTORY

FEMALES GROUP 4 12000 PPM

ANIMAL#	TYPE OF DEATH	DATE OF DEATH	STUDY DAY	PREGNANCY STATUS
4513	TERMINAL SACRIFICE	29-FEB-04	41	P
4514	TERMINAL SACRIFICE	1-MAR-04	42	P
4515	TERMINAL SACRIFICE	28-FEB-04	40	P
4516	TERMINAL SACRIFICE	28-FEB-04	40	P
4517	TERMINAL SACRIFICE	3-MAR-04	44	P
4518	TERMINAL SACRIFICE	3-MAR-04	44	P
4519	TERMINAL SACRIFICE	2-MAR-04	43	P
4520	TERMINAL SACRIFICE	3-MAR-04	44	P
4521	TERMINAL SACRIFICE	2-MAR-04	43	P
4522	TERMINAL SACRIFICE	2-MAR-04	43	P
4523	TERMINAL SACRIFICE	29-FEB-04	41	P
4524	TERMINAL SACRIFICE	3-MAR-04	44	P

NP-NOT PREGNANT, P-PREGNANT

APPENDIX N

PROPANE: COMBINED REPEATED-EXPOSURE TOXICITY, REPRODUCTION
AND NEUROTOXICITY SCREENING IN RATS VIA WHOLE-BODY
INHALATION EXPOSURES

INDIVIDUAL CLINICAL OBSERVATIONS

FEMALES GROUP 1 0 PPM

ANIMAL#	OBSERVATIONS	DAY OF STUDY - 7	0	8	5	2	8	6	3	0	4
		1	2	2	3	4	5	5			
1513	WITHIN NORMAL LIMITS	P	P	P							
1514	WITHIN NORMAL LIMITS	P	P	P	P						
1515	WITHIN NORMAL LIMITS	P	P	P	P						
1516	WITHIN NORMAL LIMITS	P	P	P	P						
1517	WITHIN NORMAL LIMITS	P	P	P	P						
1518	WITHIN NORMAL LIMITS	P	P	P	P						
1519	WITHIN NORMAL LIMITS	P	P	P							
1520	WITHIN NORMAL LIMITS	P	P	P	P						
1521	WITHIN NORMAL LIMITS	P	P	P	P						
1522	WITHIN NORMAL LIMITS	P	P	P	P						
1523	WITHIN NORMAL LIMITS	P	P	P	P						
1524	WITHIN NORMAL LIMITS	P	P	P							

CODE: 1-SLIGHT 2-MODERATE 3-MARKED P-PRESENT

APPENDIX N

PROPANE: COMBINED REPEATED-EXPOSURE TOXICITY, REPRODUCTION AND NEUROTOXICITY SCREENING IN RATS VIA WHOLE-BODY INHALATION EXPOSURES

INDIVIDUAL CLINICAL OBSERVATIONS

FEMALES GROUP 2 1200 PPM

ANIMAL#	OBSERVATIONS	DAY OF STUDY - 7	0	8	5	1 2 2 8	2 6	3 3	4 0	5 4
2513	WITHIN NORMAL LIMITS	P	P	P	P	P	P	P	P	P
	TERMINAL SACRIFICE									P
	RED STAINS EXTREMITIES/SNOUT					1				
2514	WITHIN NORMAL LIMITS	P	P	P	P					
2515	WITHIN NORMAL LIMITS	P	P	P	P					
2516	WITHIN NORMAL LIMITS	P	P	P	P					
2517	WITHIN NORMAL LIMITS	P	P	P						
2518	WITHIN NORMAL LIMITS	P	P	P						
2519	WITHIN NORMAL LIMITS	P	P	P						
2520	WITHIN NORMAL LIMITS	P	P	P	P	P				
2521	WITHIN NORMAL LIMITS	P	P	P	P					
2522	WITHIN NORMAL LIMITS	P	P	P	P					
2523	WITHIN NORMAL LIMITS	P	P	P	P					
2524	WITHIN NORMAL LIMITS	P	P	P	P					

CODE: 1-SLIGHT 2-MODERATE 3-MARKED P-PRESENT

APPENDIX N

PROPANE: COMBINED REPEATED-EXPOSURE TOXICITY, REPRODUCTION AND NEUROTOXICITY SCREENING IN RATS VIA WHOLE-BODY INHALATION EXPOSURES

INDIVIDUAL CLINICAL OBSERVATIONS

FEMALES GROUP 3 4000 PPM

ANIMAL#	OBSERVATIONS	DAY OF STUDY - 7	0	8	5	2	8	6	3	0	4
		1	2	2	3	4	5	5			
3513	WITHIN NORMAL LIMITS	P	P	P	P						
3514	WITHIN NORMAL LIMITS	P	P	P							
3515	WITHIN NORMAL LIMITS	P	P	P	P						
3516	WITHIN NORMAL LIMITS	P	P	P	P						
3517	WITHIN NORMAL LIMITS	P	P	P							
3518	WITHIN NORMAL LIMITS	P	P	P	P						
3519	WITHIN NORMAL LIMITS	P	P	P							
3520	WITHIN NORMAL LIMITS	P	P	P	P						
3521	WITHIN NORMAL LIMITS	P	P	P	P						
3522	WITHIN NORMAL LIMITS	P	P	P	P						
3523	WITHIN NORMAL LIMITS	P	P	P							
3524	WITHIN NORMAL LIMITS	P	P	P	P						

CODE: 1-SLIGHT 2-MODERATE 3-MARKED P-PRESENT

APPENDIX N

PROPANE: COMBINED REPEATED-EXPOSURE TOXICITY, REPRODUCTION AND NEUROTOXICITY SCREENING IN RATS VIA WHOLE-BODY INHALATION EXPOSURES

INDIVIDUAL CLINICAL OBSERVATIONS

FEMALES GROUP 4 12000 PPM

ANIMAL#	OBSERVATIONS	DAY OF STUDY - 7	0	8	5	2	8	6	3	0	4
		1	2	2	3	4	5	5			
4513	WITHIN NORMAL LIMITS	P	P	P							
4514	WITHIN NORMAL LIMITS	P	P	P	P						
4515	WITHIN NORMAL LIMITS	P	P	P							
4516	WITHIN NORMAL LIMITS	P	P	P							
4517	WITHIN NORMAL LIMITS	P	P	P	P						
4518	WITHIN NORMAL LIMITS	P	P	P	P						
4519	WITHIN NORMAL LIMITS	P	P	P	P						
4520	WITHIN NORMAL LIMITS	P	P	P	P						
4521	WITHIN NORMAL LIMITS	P	P	P	P						
4522	WITHIN NORMAL LIMITS	P	P	P	P						
4523	WITHIN NORMAL LIMITS	P	P	P	P						
4524	WITHIN NORMAL LIMITS	P	P	P	P						

CODE: 1-SLIGHT 2-MODERATE 3-MARKED P-PRESENT

APPENDIX O

PROPANE: COMBINED REPEATED-EXPOSURE TOXICITY, REPRODUCTION AND NEUROTOXICITY SCREENING IN RATS VIA WHOLE-BODY INHALATION EXPOSURES

INDIVIDUAL CLINICAL OBSERVATIONS DURING GESTATION

GROUP 1 0 PPM

FEMALE#	OBSERVATIONS	DAY OF GESTATION	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1513	ALOPECIA - EXTREMITIES/SNOUT																						2
	WITHIN NORMAL LIMITS		P				P				P							P					
1514	WITHIN NORMAL LIMITS		P				P				P							P					P
1515	WITHIN NORMAL LIMITS		P				P				P							P					P
1516	WITHIN NORMAL LIMITS		P				P				P							P					P
1517	WITHIN NORMAL LIMITS		P				P				P							P					P
1518	WITHIN NORMAL LIMITS		P				P				P							P					P
1519	WITHIN NORMAL LIMITS		P				P				P							P					P
1520	WITHIN NORMAL LIMITS		P				P				P							P					P
1521	WITHIN NORMAL LIMITS		P				P				P							P					P
1522	WITHIN NORMAL LIMITS		P				P				P							P					P
1523	WITHIN NORMAL LIMITS		P				P				P							P					P
1524	WITHIN NORMAL LIMITS		P				P				P							P					P

CODE: 1-SLIGHT 2-MODERATE 3-MARKED P-PRESENT

APPENDIX O

PROPANE: COMBINED REPEATED-EXPOSURE TOXICITY, REPRODUCTION AND NEUROTOXICITY SCREENING IN RATS VIA WHOLE-BODY INHALATION EXPOSURES

INDIVIDUAL CLINICAL OBSERVATIONS DURING GESTATION

GROUP 2 1200 PPM

FEMALE#	OBSERVATIONS	DAY OF GESTATION	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
2514	WITHIN NORMAL LIMITS		P				P						P				P						P
2515	WITHIN NORMAL LIMITS		P				P						P				P						P
2516	WITHIN NORMAL LIMITS		P				P						P				P						P
2517	WITHIN NORMAL LIMITS		P				P						P				P						P
2518	WITHIN NORMAL LIMITS		P				P						P				P						P
2519	WITHIN NORMAL LIMITS		P				P						P				P						P
2520	WITHIN NORMAL LIMITS		P				P						P				P						P
2521	WITHIN NORMAL LIMITS		P				P						P				P						P
2522	WITHIN NORMAL LIMITS		P				P						P				P						P
2523	WITHIN NORMAL LIMITS		P				P						P				P						P
2524	WITHIN NORMAL LIMITS		P				P						P				P						P

CODE: 1-SLIGHT 2-MODERATE 3-MARKED P-PRESENT

APPENDIX O

PROPANE: COMBINED REPEATED-EXPOSURE TOXICITY, REPRODUCTION AND NEUROTOXICITY SCREENING IN RATS VIA WHOLE-BODY INHALATION EXPOSURES

INDIVIDUAL CLINICAL OBSERVATIONS DURING GESTATION

GROUP 3 4000 PPM

FEMALE#	OBSERVATIONS	DAY OF GESTATION	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
3513	WITHIN NORMAL LIMITS		P							P							P						P
3514	WITHIN NORMAL LIMITS		P							P							P						P
3515	WITHIN NORMAL LIMITS		P							P							P						P
3516	ALOPECIA - EXTREMITIES/SNOUT									2							2						2
	WITHIN NORMAL LIMITS		P																				
3517	WITHIN NORMAL LIMITS		P							P							P						P
3518	WITHIN NORMAL LIMITS		P							P							P						P
3519	WITHIN NORMAL LIMITS		P							P							P						P
3520	ALOPECIA - EXTREMITIES/SNOUT									2													
	WITHIN NORMAL LIMITS		P														P						P
3521	WITHIN NORMAL LIMITS		P							P							P						P
3522	WITHIN NORMAL LIMITS		P							P							P						P
3523	WITHIN NORMAL LIMITS		P							P							P						P
3524	WITHIN NORMAL LIMITS		P							P							P						P

CODE: 1-SLIGHT 2-MODERATE 3-MARKED P-PRESENT

APPENDIX O

PROPANE: COMBINED REPEATED-EXPOSURE TOXICITY, REPRODUCTION AND NEUROTOXICITY SCREENING IN RATS VIA WHOLE-BODY INHALATION EXPOSURES

INDIVIDUAL CLINICAL OBSERVATIONS DURING GESTATION

GROUP 4 12000 PPM

FEMALE#	OBSERVATIONS	DAY OF GESTATION 0	1 2 3 4 5 6 7 8 9	1 0	1 2 3 4 5 6 7 8 9	2 0
4513	WITHIN NORMAL LIMITS	P		P		P
4514	WITHIN NORMAL LIMITS	P		P		P
4515	WITHIN NORMAL LIMITS	P		P		P
4516	WITHIN NORMAL LIMITS	P		P		P
4517	WITHIN NORMAL LIMITS	P		P		P
4518	ALOPECIA - EXTREMITIES/SNOUT			2		2
	WITHIN NORMAL LIMITS	P				
4519	WITHIN NORMAL LIMITS	P		P		P
4520	WITHIN NORMAL LIMITS	P		P		P
4521	WITHIN NORMAL LIMITS	P		P		P
4522	WITHIN NORMAL LIMITS	P		P		P
4523	WITHIN NORMAL LIMITS	P		P		P
4524	WITHIN NORMAL LIMITS	P		P		P

CODE: 1-SLIGHT 2-MODERATE 3-MARKED P-PRESENT

APPENDIX P

PROPANE: COMBINED REPEATED-EXPOSURE TOXICITY, REPRODUCTION AND NEUROTOXICITY SCREENING IN RATS VIA WHOLE-BODY INHALATION EXPOSURES

INDIVIDUAL MATERNAL CLINICAL OBSERVATIONS DURING LACTATION

GROUP 1 0 PPM

FEMALE#	OBSERVATIONS	DAY OF LACTATION 0	1	2	3	4
1513	TERMINAL SACRIFICE					P
	ALOPECIA - EXTREMITIES/SNOUT	3	2			3
1514	WITHIN NORMAL LIMITS	P	P			P
	TERMINAL SACRIFICE					P
1515	WITHIN NORMAL LIMITS	P	P			P
	TERMINAL SACRIFICE					P
1516	WITHIN NORMAL LIMITS	P	P			P
	TERMINAL SACRIFICE					P
1517	WITHIN NORMAL LIMITS	P	P			P
	TERMINAL SACRIFICE					P
1518	WITHIN NORMAL LIMITS	P	P			P
	TERMINAL SACRIFICE					P
1519	WITHIN NORMAL LIMITS	P	P			P
	TERMINAL SACRIFICE					P
1520	WITHIN NORMAL LIMITS	P				
	TERMINAL SACRIFICE					P
	RED EXUDATE FROM ANO-GENITAL AREA			P		
	ALOPECIA - EXTREMITIES/SNOUT			3		3
1521	WITHIN NORMAL LIMITS	P	P			P
	TERMINAL SACRIFICE					P

CODE: 1-SLIGHT 2-MODERATE 3-MARKED P-PRESENT

APPENDIX P

PROPANE: COMBINED REPEATED-EXPOSURE TOXICITY, REPRODUCTION AND NEUROTOXICITY SCREENING IN RATS VIA WHOLE-BODY INHALATION EXPOSURES

INDIVIDUAL MATERNAL CLINICAL OBSERVATIONS DURING LACTATION

GROUP 1 0 PPM

FEMALE#	OBSERVATIONS	DAY OF LACTATION	0	1	2	3	4
1522	WITHIN NORMAL LIMITS		P	P			P
	TERMINAL SACRIFICE						P
1523	WITHIN NORMAL LIMITS				P		P
	TERMINAL SACRIFICE						P
1524	WITHIN NORMAL LIMITS		P	P			P
	TERMINAL SACRIFICE						P

CODE: 1-SLIGHT 2-MODERATE 3-MARKED P-PRESENT

APPENDIX P

PROPANE: COMBINED REPEATED-EXPOSURE TOXICITY, REPRODUCTION AND NEUROTOXICITY SCREENING IN RATS VIA WHOLE-BODY INHALATION EXPOSURES

INDIVIDUAL MATERNAL CLINICAL OBSERVATIONS DURING LACTATION

GROUP 2 1200 PPM

FEMALE#	OBSERVATIONS	DAY OF LACTATION	0	1	2	3	4
2514	WITHIN NORMAL LIMITS		P	P			P
	TERMINAL SACRIFICE						P
2515	WITHIN NORMAL LIMITS		P	P			P
	TERMINAL SACRIFICE						P
2516	WITHIN NORMAL LIMITS		P	P			P
	TERMINAL SACRIFICE						P
2517	WITHIN NORMAL LIMITS		P	P			P
	TERMINAL SACRIFICE						P
2518	WITHIN NORMAL LIMITS		P	P			P
	TERMINAL SACRIFICE						P
2519	WITHIN NORMAL LIMITS			P			P
	TERMINAL SACRIFICE						P
2520	WITHIN NORMAL LIMITS		P	P			P
	TERMINAL SACRIFICE						P
2521	WITHIN NORMAL LIMITS		P	P			P
	TERMINAL SACRIFICE						P
2522	WITHIN NORMAL LIMITS		P	P			P
	TERMINAL SACRIFICE						P
2523	WITHIN NORMAL LIMITS		P	P			
	TERMINAL SACRIFICE						P
	ALOPECIA - GENERAL						2

CODE: 1-SLIGHT 2-MODERATE 3-MARKED P-PRESENT

APPENDIX P

PROPANE: COMBINED REPEATED-EXPOSURE TOXICITY, REPRODUCTION AND NEUROTOXICITY SCREENING IN RATS VIA WHOLE-BODY INHALATION EXPOSURES

INDIVIDUAL MATERNAL CLINICAL OBSERVATIONS DURING LACTATION

GROUP 2 1200 PPM

FEMALE#	OBSERVATIONS	DAY OF LACTATION	0	1	2	3	4
2524	WITHIN NORMAL LIMITS		P				
	TERMINAL SACRIFICE						P
	ALOPECIA - EXTREMITIES/SNOUT				2		2

CODE: 1-SLIGHT 2-MODERATE 3-MARKED P-PRESENT

APPENDIX P

PROPANE: COMBINED REPEATED-EXPOSURE TOXICITY, REPRODUCTION AND NEUROTOXICITY SCREENING IN RATS VIA WHOLE-BODY INHALATION EXPOSURES

INDIVIDUAL MATERNAL CLINICAL OBSERVATIONS DURING LACTATION

GROUP 3 4000 PPM

FEMALE#	OBSERVATIONS	DAY OF LACTATION	0	1	2	3	4
3513	WITHIN NORMAL LIMITS		P	P			P
	TERMINAL SACRIFICE						P
3514	WITHIN NORMAL LIMITS		P	P			P
	TERMINAL SACRIFICE						P
3515	WITHIN NORMAL LIMITS		P	P			P
	TERMINAL SACRIFICE						P
3516	TERMINAL SACRIFICE						P
	ALOPECIA - EXTREMITIES/SNOUT		2	3			3
3517	WITHIN NORMAL LIMITS		P	P			P
	TERMINAL SACRIFICE						P
3518	WITHIN NORMAL LIMITS		P	P			P
	TERMINAL SACRIFICE						P
3519	WITHIN NORMAL LIMITS		P	P			P
	TERMINAL SACRIFICE						P
3520	WITHIN NORMAL LIMITS			P			P
	TERMINAL SACRIFICE						P
	ALOPECIA - EXTREMITIES/SNOUT		2				
3521	WITHIN NORMAL LIMITS		P	P			P
	TERMINAL SACRIFICE						P
3522	WITHIN NORMAL LIMITS		P				P
	TERMINAL SACRIFICE						P

CODE: 1-SLIGHT 2-MODERATE 3-MARKED P-PRESENT

APPENDIX P

PROPANE: COMBINED REPEATED-EXPOSURE TOXICITY, REPRODUCTION AND NEUROTOXICITY SCREENING IN RATS VIA WHOLE-BODY INHALATION EXPOSURES

INDIVIDUAL MATERNAL CLINICAL OBSERVATIONS DURING LACTATION

GROUP 3 4000 PPM

FEMALE#	OBSERVATIONS	DAY OF LACTATION	0	1	2	3	4
3523	WITHIN NORMAL LIMITS		P	P			P
	TERMINAL SACRIFICE						P
3524[a]	WITHIN NORMAL LIMITS		P	P			P
	TERMINAL SACRIFICE						P

CODE: 1-SLIGHT 2-MODERATE 3-MARKED P-PRESENT

[a]Animal had no observations on Day 1 due to litter loss.

APPENDIX P

PROPANE: COMBINED REPEATED-EXPOSURE TOXICITY, REPRODUCTION AND NEUROTOXICITY SCREENING IN RATS VIA WHOLE-BODY INHALATION EXPOSURES

INDIVIDUAL MATERNAL CLINICAL OBSERVATIONS DURING LACTATION

GROUP 4 12000 PPM

FEMALE#	OBSERVATIONS	DAY OF LACTATION	0	1	2	3	4
4513	TERMINAL SACRIFICE						P
	ALOPECIA - EXTREMITIES/SNOUT		2	2			2
4514	WITHIN NORMAL LIMITS				P		P
	TERMINAL SACRIFICE						P
4515	WITHIN NORMAL LIMITS		P	P			P
	TERMINAL SACRIFICE						P
4516	WITHIN NORMAL LIMITS				P		P
	TERMINAL SACRIFICE						P
4517	WITHIN NORMAL LIMITS		P	P			P
	TERMINAL SACRIFICE						P
4518	TERMINAL SACRIFICE						P
	ALOPECIA - EXTREMITIES/SNOUT		3	3			3
4519	WITHIN NORMAL LIMITS		P	P			P
	TERMINAL SACRIFICE						P
4520	WITHIN NORMAL LIMITS		P	P			P
	TERMINAL SACRIFICE						P
4521	WITHIN NORMAL LIMITS		P	P			P
	TERMINAL SACRIFICE						P
4522	WITHIN NORMAL LIMITS		P				P
	TERMINAL SACRIFICE						P
	ALOPECIA - EXTREMITIES/SNOUT				2		

CODE: 1-SLIGHT 2-MODERATE 3-MARKED P-PRESENT

APPENDIX P

PROPANE: COMBINED REPEATED-EXPOSURE TOXICITY, REPRODUCTION AND NEUROTOXICITY SCREENING IN RATS VIA WHOLE-BODY INHALATION EXPOSURES

INDIVIDUAL MATERNAL CLINICAL OBSERVATIONS DURING LACTATION

GROUP 4 12000 PPM

FEMALE#	OBSERVATIONS	DAY OF LACTATION	0	1	2	3	4
4523	WITHIN NORMAL LIMITS		P	P			P
	TERMINAL SACRIFICE						P
4524	WITHIN NORMAL LIMITS				P		P
	TERMINAL SACRIFICE						P

CODE: 1-SLIGHT 2-MODERATE 3-MARKED P-PRESENT

APPENDIX Q

PROPANE: COMBINED REPEATED-EXPOSURE TOXICITY, REPRODUCTION
AND NEUROTOXICITY SCREENING IN RATS VIA WHOLE-BODY
INHALATION EXPOSURES

INDIVIDUAL BODY WEIGHTS (GRAMS)

FEMALES GROUP 1 0 PPM

	DAY OF STUDY															
ANIMAL#	-7	0	4	7	11	14	18	21	25	28	32	35	39	42	46	49
1513	166	191	199	204	210	222										
1514	164	189	203	223	230	232										
1515	164	197	196	204	205	211										
1516	169	188	208	225	229	228										
1517	170	196	209	226	226	242										
1518	157	184	199	212	225	223										
1519	179	200	210	214	223	231										
1520	155	186	201	200	206	224										
1521	173	205	207	229	238	246										
1522	168	200	219	226	237	238										
1523	166	196	203	209	214	212										
1524	173	200	213	207	220	235										
MEAN	167	194	205	215	222	229										
S.D.	6.8	6.6	6.8	10.3	11.1	10.8										
N	12	12	12	12	12	12										

APPENDIX Q

PROPANE: COMBINED REPEATED-EXPOSURE TOXICITY, REPRODUCTION AND NEUROTOXICITY SCREENING IN RATS VIA WHOLE-BODY INHALATION EXPOSURES

INDIVIDUAL BODY WEIGHTS (GRAMS)

FEMALES GROUP 2 1200 PPM

	DAY OF STUDY															
ANIMAL#	-7	0	4	7	11	14	18	21	25	28	32	35	39	42	46	49
2513	160	180	190	203	210	213	217	220	223	230	228	230	242	246	250	250
2514	157	184	185	193	200	203	206									
2515	173	210	218	223	230	234										
2516	170	192	212	218	227	237										
2517	167	196	206	196	203	210										
2518	177	211	223	225	239	249										
2519	164	196	213	215	221	230										
2520	172	210	218	223	231	228	254	274	286							
2521	174	198	211	217	230	231										
2522	161	183	193	192	200	199										
2523	166	193	195	207	215	223										
2524	168	201	212	218	234	231										
MEAN	167	196	206	211	220	224	226	247	255	230	228	230	242	246	250	250
S.D.	6.2	10.5	12.5	12.2	13.9	14.9	25.1	38.6	44.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
N	12	12	12	12	12	12	3	2	2	1	1	1	1	1	1	1

APPENDIX Q

PROPANE: COMBINED REPEATED-EXPOSURE TOXICITY, REPRODUCTION AND NEUROTOXICITY SCREENING IN RATS VIA WHOLE-BODY INHALATION EXPOSURES

INDIVIDUAL BODY WEIGHTS (GRAMS)

FEMALES GROUP 3 4000 PPM

	DAY OF STUDY															
ANIMAL#	-7	0	4	7	11	14	18	21	25	28	32	35	39	42	46	49
3513	161	188	197	204	210	217										
3514	169	197	203	207	209	212										
3515	172	216	220	233	241	248										
3516	157	185	202	200	209	214										
3517	166	189	199	201	211	220										
3518	161	189	199	207	218	220										
3519	165	195	206	216	214	233										
3520	168	202	216	221	222	231										
3521	170	208	217	224	227	229										
3522	173	207	219	225	229	234							259[a]	278		
3523	178	213	224	224	235	242										
3524	174	211	223	227	236	242										
MEAN	168	200	210	216	222	229							259	278		
S.D.	6.2	10.9	10.3	11.2	11.5	11.8							0.0	0.0		
N	12	12	12	12	12	12							1	1		

[a]Routine body weights were resumed after total litter loss.

APPENDIX Q

PROPANE: COMBINED REPEATED-EXPOSURE TOXICITY, REPRODUCTION AND NEUROTOXICITY SCREENING IN RATS VIA WHOLE-BODY INHALATION EXPOSURES

INDIVIDUAL BODY WEIGHTS (GRAMS)

FEMALES GROUP 4 12000 PPM

	DAY OF STUDY															
ANIMAL#	-7	0	4	7	11	14	18	21	25	28	32	35	39	42	46	49
4513	173	209	215	224	239	244										
4514	155	196	205	208	217	219										
4515	166	200	209	207	214	218										
4516	174	208	217	213	223	231										
4517	167	205	211	216	226	224										
4518	169	202	209	218	225	226										
4519	163	202	209	225	233	239										
4520	171	200	209	216	229	228										
4521	169	210	223	232	241	253										
4522	176	214	218	233	241	241										
4523	165	187	199	205	202	213										
4524	159	185	191	194	203	202								240[a]		
MEAN	167	201	210	216	224	228								240		
S.D.	6.1	8.7	8.8	11.3	13.6	14.3								0.0		
N	12	12	12	12	12	12								1		

[a]Routine body weights were resumed after total litter loss.

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APPENDIX Q

PROPANE: COMBINED REPEATED-EXPOSURE TOXICITY, REPRODUCTION AND NEUROTOXICITY SCREENING IN RATS VIA WHOLE-BODY INHALATION EXPOSURES

INDIVIDUAL BODY WEIGHTS (GRAMS)

FEMALES GROUP 1 0 PPM

	DAY OF STUDY
ANIMAL#	53

APPENDIX Q

PROPANE: COMBINED REPEATED-EXPOSURE TOXICITY, REPRODUCTION AND NEUROTOXICITY SCREENING IN RATS VIA WHOLE-BODY INHALATION EXPOSURES

INDIVIDUAL BODY WEIGHTS (GRAMS)

FEMALES GROUP 2 1200 PPM

ANIMAL#	DAY OF STUDY 53
2513	255
MEAN	255
S.D.	0.0
N	1

APPENDIX Q

PROPANE: COMBINED REPEATED-EXPOSURE TOXICITY, REPRODUCTION
AND NEUROTOXICITY SCREENING IN RATS VIA WHOLE-BODY
INHALATION EXPOSURES

INDIVIDUAL BODY WEIGHTS (GRAMS)

FEMALES GROUP 3 4000 PPM

	DAY OF STUDY
ANIMAL#	53

APPENDIX Q

PROPANE: COMBINED REPEATED-EXPOSURE TOXICITY, REPRODUCTION
AND NEUROTOXICITY SCREENING IN RATS VIA WHOLE-BODY
INHALATION EXPOSURES

INDIVIDUAL BODY WEIGHTS (GRAMS)

FEMALES GROUP 4 12000 PPM

	DAY OF STUDY
ANIMAL#	53

APPENDIX R

PROPANE: COMBINED REPEATED-EXPOSURE TOXICITY, REPRODUCTION AND NEUROTOXICITY SCREENING IN RATS VIA WHOLE-BODY INHALATION EXPOSURES

INDIVIDUAL BODY WEIGHT GAIN (GRAMS)

FEMALES GROUP 1 0 PPM

	DAY OF STUDY														
ANIMAL#	-7-0	0-4	4-7	7-11	11-14	14-18	18-21	21-25	25-28	28-32	32-35	35-39	39-42	42-46	46-49	49-53
1513	25	8	5	7	12											
1514	26	14	20	7	2											
1515	34	-2	9	1	6											
1516	18	20	17	4	-1											
1517	26	13	17	0	16											
1518	27	15	13	13	-2											
1519	21	9	4	9	8											
1520	31	15	-1	6	18											
1521	31	2	22	10	8											
1522	32	19	7	11	1											
1523	30	7	6	5	-2											
1524	27	13	-6	13	15											
MEAN	27	11	9	7	7											
S.D.	4.6	6.6	8.5	4.2	7.2											
N	12	12	12	12	12											

APPENDIX R

PROPANE: COMBINED REPEATED-EXPOSURE TOXICITY, REPRODUCTION AND NEUROTOXICITY SCREENING IN RATS VIA WHOLE-BODY INHALATION EXPOSURES

INDIVIDUAL BODY WEIGHT GAIN (GRAMS)

FEMALES GROUP 2 1200 PPM

	DAY OF STUDY															
ANIMAL#	-7-0	0-4	4-7	7-11	11-14	14-18	18-21	21-25	25-28	28-32	32-35	35-39	39-42	42-46	46-49	49-53
2513	21	10	13	7	3	4	3	4	6	-1	1	12	4	4	0	5
2514	27	1	8	8	3	3										
2515	36	9	5	7	4											
2516	22	20	6	9	10											
2517	29	10	-11	7	7											
2518	34	13	2	14	11											
2519	32	17	2	7	9											
2520	38	8	5	8	-4	27	20	12								
2521	24	13	6	13	1											
2522	22	9	-1	8	-1											
2523	27	2	12	9	7											
2524	33	11	7	16	-3											
MEAN	29	10	4	9	4	11	11	8	6	-1	1	12	4	4	0	5
S.D.	5.8	5.4	6.1	3.1	5.0	13.2	12.4	5.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
N	12	12	12	12	12	3	2	2	1	1	1	1	1	1	1	1

APPENDIX R

PROPANE: COMBINED REPEATED-EXPOSURE TOXICITY, REPRODUCTION AND NEUROTOXICITY SCREENING IN RATS VIA WHOLE-BODY INHALATION EXPOSURES

INDIVIDUAL BODY WEIGHT GAIN (GRAMS)

FEMALES GROUP 3 4000 PPM

	DAY OF STUDY															
ANIMAL#	-7-0	0-4	4-7	7-11	11-14	14-18	18-21	21-25	25-28	28-32	32-35	35-39	39-42	42-46	46-49	49-53
3513	28	8	8	6	7											
3514	28	5	4	2	3											
3515	44	4	13	8	7											
3516	28	17	-2	9	5											
3517	24	10	3	9	10											
3518	28	11	8	12	2											
3519	29	11	10	-2	19											
3520	34	14	5	2	9											
3521	39	9	6	4	2											
3522	34	11	6	4	5								19[a]			
3523	35	11	1	11	7											
3524	37	12	4	9	6											
MEAN	32	10	5	6	7								19			
S.D.	5.8	3.6	4.0	4.1	4.5								0.0			
N	12	12	12	12	12								1			

[a]Routine body weights were resumed after total litter loss.

APPENDIX R

PROPANE: COMBINED REPEATED-EXPOSURE TOXICITY, REPRODUCTION AND NEUROTOXICITY SCREENING IN RATS VIA WHOLE-BODY INHALATION EXPOSURES

INDIVIDUAL BODY WEIGHT GAIN (GRAMS)

FEMALES GROUP 4 12000 PPM

	DAY OF STUDY														
ANIMAL#	-7-0	0-4	4-7	7-11	11-14	14-18	18-21	21-25	25-28	28-32	32-35	35-39	39-42	42-46	46-49	49-53
4513	36	6	9	15	5											
4514	41	9	4	9	2											
4515	34	9	-2	8	3											
4516	34	10	-4	10	8											
4517	39	6	5	10	-1											
4518	33	7	9	7	1											
4519	39	8	15	9	5											
4520	29	9	8	13	-2											
4521	40	14	8	10	12											
4522	38	4	15	9	0											
4523	22	12	7	-4	11											
4524	27	6	3	9	-1											
MEAN	34	8	6	9	4											
S.D.	5.8	2.8	5.7	4.5	4.7											
N	12	12	12	12	12											

APPENDIX R

PROPANE: COMBINED REPEATED-EXPOSURE TOXICITY, REPRODUCTION AND NEUROTOXICITY SCREENING IN RATS VIA WHOLE-BODY INHALATION EXPOSURES

INDIVIDUAL BODY WEIGHT GAIN (GRAMS)

FEMALES GROUP 1 0 PPM

ANIMAL#	DAY OF STUDY 0-14
1513	32
1514	42
1515	14
1516	41
1517	46
1518	39
1519	31
1520	38
1521	41
1522	38
1523	16
1524	35
MEAN	34
S.D.	10.0
N	12

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APPENDIX R

PROPANE: COMBINED REPEATED-EXPOSURE TOXICITY, REPRODUCTION AND NEUROTOXICITY SCREENING IN RATS VIA WHOLE-BODY INHALATION EXPOSURES

INDIVIDUAL BODY WEIGHT GAIN (GRAMS)

FEMALES GROUP 2 1200 PPM

ANIMAL#	DAY OF STUDY 0-14
2513	33
2514	19
2515	24
2516	45
2517	14
2518	39
2519	34
2520	18
2521	33
2522	16
2523	30
2524	31
MEAN	28
S.D.	9.8
N	12

APPENDIX R

PROPANE: COMBINED REPEATED-EXPOSURE TOXICITY, REPRODUCTION AND NEUROTOXICITY SCREENING IN RATS VIA WHOLE-BODY INHALATION EXPOSURES

INDIVIDUAL BODY WEIGHT GAIN (GRAMS)

FEMALES GROUP 3 4000 PPM

ANIMAL#	DAY OF STUDY 0-14
3513	28
3514	15
3515	32
3516	29
3517	31
3518	32
3519	38
3520	30
3521	21
3522	26
3523	30
3524	30
MEAN	29
S.D.	5.8
N	12

APPENDIX R

PROPANE: COMBINED REPEATED-EXPOSURE TOXICITY, REPRODUCTION
AND NEUROTOXICITY SCREENING IN RATS VIA WHOLE-BODY
INHALATION EXPOSURES

INDIVIDUAL BODY WEIGHT GAIN (GRAMS)

FEMALES GROUP 4 12000 PPM

ANIMAL#	DAY OF STUDY 0-14
4513	35
4514	23
4515	18
4516	23
4517	19
4518	24
4519	37
4520	28
4521	43
4522	27
4523	26
4524	17
MEAN	27
S.D.	8.0
N	12

APPENDIX S

PROPANE: COMBINED REPEATED-EXPOSURE TOXICITY, REPRODUCTION AND NEUROTOXICITY SCREENING IN RATS VIA WHOLE-BODY INHALATION EXPOSURES

INDIVIDUAL GESTATION BODY WEIGHTS (GRAMS)

GROUP 1 0 PPM

	DAY OF GESTATION			
ANIMAL#	0	7	14	20
1513	223	259	289	344
1514	253	289	321	374
1515	225	255	291	352
1516	248	293	321	397
1517	243	261	292	365
1518	230	266	284	353
1519	237	268	305	369
1520	228	268	308	370
1521	252	291	324	404
1522	250	283	311	388
1523	225	253	278	341
1524	237	282	310	405
MEAN	238	272	303	372
S.D.	11.2	14.4	15.6	22.5
N	12	12	12	12

APPENDIX S

PROPANE: COMBINED REPEATED-EXPOSURE TOXICITY, REPRODUCTION AND NEUROTOXICITY SCREENING IN RATS VIA WHOLE-BODY INHALATION EXPOSURES

INDIVIDUAL GESTATION BODY WEIGHTS (GRAMS)

GROUP 2 1200 PPM

	DAY OF GESTATION			
ANIMAL#	0	7	14	20
2513x NP				
2514	209	237	257	328
2515	250	285	319	407
2516	226	268	308	381
2517	219	256	295	380
2518	261	307	351	436
2519	229	250	283	356
2520	277	310	350	418
2521	234	266	295	370
2522	214	242	266	339
2523	224	246	281	336
2524	239	267	306	389
MEAN	235	267	301	376
S.D.	20.7	24.8	30.2	34.9
N	11	11	11	11

NP=NOT PREGNANT x=EXCLUDED FROM MEAN

APPENDIX S

PROPANE: COMBINED REPEATED-EXPOSURE TOXICITY, REPRODUCTION AND NEUROTOXICITY SCREENING IN RATS VIA WHOLE-BODY INHALATION EXPOSURES

INDIVIDUAL GESTATION BODY WEIGHTS (GRAMS)

GROUP 3 4000 PPM

	DAY OF GESTATION			
ANIMAL#	0	7	14	20
3513	217	247	276	345
3514	213	237	257	324
3515	247	287	330	412
3516	224	268	313	390
3517	224	255	284	337
3518	230	268	293	361
3519	234	277	315	360
3520	237	271	299	368
3521	242	269	307	390
3522	240	269	306	317
3523	249	285	322	357
3524	253	295	333	428
MEAN	234	269	303	366
S.D.	12.7	16.6	22.5	33.9
N	12	12	12	12

APPENDIX S

PROPANE: COMBINED REPEATED-EXPOSURE TOXICITY, REPRODUCTION AND NEUROTOXICITY SCREENING IN RATS VIA WHOLE-BODY INHALATION EXPOSURES

INDIVIDUAL GESTATION BODY WEIGHTS (GRAMS)

GROUP 4 12000 PPM

	DAY OF GESTATION			
ANIMAL#	0	7	14	20
4513	238	286	327	394
4514	230	264	294	366
4515	223	257	286	346
4516	226	269	303	371
4517	236	273	305	391
4518	245	276	301	378
4519	245	279	311	388
4520	243	279	309	383
4521	255	299	337	418
4522	257	299	335	393
4523	214	248	273	354
4524	215	247	279	291
MEAN	236	273	305	373
S.D.	14.4	17.3	20.4	32.2
N	12	12	12	12

APPENDIX T

PROPANE: COMBINED REPEATED-EXPOSURE TOXICITY, REPRODUCTION AND NEUROTOXICITY SCREENING IN RATS VIA WHOLE-BODY INHALATION EXPOSURES

INDIVIDUAL GESTATION BODY WEIGHT GAIN (GRAMS)

GROUP 1 0 PPM

	DAY OF GESTATION			
ANIMAL#	0 - 7	7 - 14	14 - 20	0 - 20
1513	36	31	55	121
1514	36	32	53	122
1515	30	36	61	128
1516	45	28	77	150
1517	18	30	73	122
1518	36	18	69	123
1519	31	37	63	132
1520	39	40	62	142
1521	39	33	80	152
1522	33	28	77	137
1523	28	24	64	116
1524	45	28	96	169
MEAN	35	30	69	134
S.D.	7.5	6.0	12.0	16.0
N	12	12	12	12

APPENDIX T

PROPANE: COMBINED REPEATED-EXPOSURE TOXICITY, REPRODUCTION AND NEUROTOXICITY SCREENING IN RATS VIA WHOLE-BODY INHALATION EXPOSURES

INDIVIDUAL GESTATION BODY WEIGHT GAIN (GRAMS)

GROUP 2 1200 PPM

	DAY OF GESTATION			
ANIMAL#	0 - 7	7 - 14	14 - 20	0 - 20
2513x NP				
2514	28	20	71	119
2515	34	34	88	157
2516	42	40	73	154
2517	37	39	85	161
2518	46	43	86	175
2519	21	33	73	127
2520	34	39	68	141
2521	32	29	75	136
2522	29	24	73	126
2523	22	35	55	112
2524	28	39	83	150
MEAN	32	34	75	142
S.D.	7.6	7.1	9.7	19.5
N	11	11	11	11

NP=NOT PREGNANT x=EXCLUDED FROM MEAN

Huntingdon Life Sciences 03-4245S
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APPENDIX T

PROPANE: COMBINED REPEATED-EXPOSURE TOXICITY, REPRODUCTION AND NEUROTOXICITY SCREENING IN RATS VIA WHOLE-BODY INHALATION EXPOSURES

INDIVIDUAL GESTATION BODY WEIGHT GAIN (GRAMS)

GROUP 3 4000 PPM

	DAY OF GESTATION			
ANIMAL#	0 - 7	7 - 14	14 - 20	0 - 20
3513	30	28	70	128
3514	23	21	67	111
3515	40	43	82	165
3516	44	46	77	166
3517	31	29	53	113
3518	37	26	68	130
3519	43	38	45	126
3520	35	28	69	131
3521	27	38	83	148
3522	29	37	12	78
3523	36	37	34	108
3524	42	38	95	175
MEAN	35	34	63	132
S.D.	6.7	7.5	23.5	28.2
N	12	12	12	12

APPENDIX T

PROPANE: COMBINED REPEATED-EXPOSURE TOXICITY, REPRODUCTION AND NEUROTOXICITY SCREENING IN RATS VIA WHOLE-BODY INHALATION EXPOSURES

INDIVIDUAL GESTATION BODY WEIGHT GAIN (GRAMS)

GROUP 4 12000 PPM

	DAY OF GESTATION			
ANIMAL#	0 - 7	7 - 14	14 - 20	0 - 20
4513	48	41	67	156
4514	34	30	72	136
4515	33	30	60	123
4516	43	34	68	144
4517	37	32	86	155
4518	31	25	77	133
4519	34	31	77	142
4520	36	30	74	140
4521	44	38	81	162
4522	42	35	59	136
4523	34	25	80	140
4524	32	32	12	76
MEAN	37	32	68	137
S.D.	5.4	4.7	19.5	22.1
N	12	12	12	12

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APPENDIX U

PROPANE: COMBINED REPEATED-EXPOSURE TOXICITY, REPRODUCTION AND NEUROTOXICITY SCREENING IN RATS VIA WHOLE-BODY INHALATION EXPOSURES

INDIVIDUAL MATERNAL LACTATION BODY WEIGHTS (GRAMS)

GROUP 1 0 PPM

	DAY OF LACTATION	
Animal No.	1	4
1513	261	297
1514	293	298
1515	266	280
1516	300	311
1517	273	286
1518	262	273
1519	280	297
1520	282	296
1521	305	319
1522	302	296
1523	243	257
1524	287	302
MEAN	280	293
S.D.	19.1	16.7
N	12	12

APPENDIX U

PROPANE: COMBINED REPEATED-EXPOSURE TOXICITY, REPRODUCTION AND NEUROTOXICITY SCREENING IN RATS VIA WHOLE-BODY INHALATION EXPOSURES

INDIVIDUAL MATERNAL LACTATION BODY WEIGHTS (GRAMS)

GROUP 2 1200 PPM

	DAY OF LACTATION	
Animal No.	1	4
2514	245	273
2515	290	311
2516	280	296
2517	276	297
2518	316	332
2519	255	268
2520	324	348
2521	283	309
2522	253	273
2523	252	268
2524	289	306
MEAN	278	298
S.D.	26.1	26.5
N	11	11

APPENDIX U

PROPANE: COMBINED REPEATED-EXPOSURE TOXICITY, REPRODUCTION AND NEUROTOXICITY SCREENING IN RATS VIA WHOLE-BODY INHALATION EXPOSURES

INDIVIDUAL MATERNAL LACTATION BODY WEIGHTS (GRAMS)

GROUP 3 4000 PPM

	DAY OF LACTATION	
Animal No.	1	4
3513	266	217
3514	242	245
3515	307	317
3516	287	296
3517	259	285
3518	264	270
3519	288	306
3520	263	277
3521	288	296
3523	304	302
3524	323	333
MEAN	281	286
S.D.	24.3	33.1
N	11	11

APPENDIX U

PROPANE: COMBINED REPEATED-EXPOSURE TOXICITY, REPRODUCTION AND NEUROTOXICITY SCREENING IN RATS VIA WHOLE-BODY INHALATION EXPOSURES

INDIVIDUAL MATERNAL LACTATION BODY WEIGHTS (GRAMS)

GROUP 4 12000 PPM

	DAY OF LACTATION	
Animal No.	1	4
4513	296	326
4514	271	290
4515	261	273
4516	279	298
4517	261	274
4518	295	312
4519	298	239
4520	285	306
4521	309	303
4522	307	318
4523	260	287
MEAN	284	293
S.D.	18.6	24.7
N	11	11

APPENDIX V

PROPANE: COMBINED REPEATED-EXPOSURE TOXICITY, REPRODUCTION AND NEUROTOXICITY SCREENING IN RATS VIA WHOLE-BODY INHALATION EXPOSURES

INDIVIDUAL MATERNAL LACTATION BODY WEIGHT GAIN (GRAMS)

GROUP 1 0 PPM

	DAY OF LACTATION
FEMALE#	1 - 4
1513	36
1514	5
1515	13
1516	11
1517	14
1518	11
1519	17
1520	14
1521	14
1522	-6
1523	14
1524	15
MEAN	13
S.D.	9.4
N	12

APPENDIX V

PROPANE: COMBINED REPEATED-EXPOSURE TOXICITY, REPRODUCTION AND NEUROTOXICITY SCREENING IN RATS VIA WHOLE-BODY INHALATION EXPOSURES

INDIVIDUAL MATERNAL LACTATION BODY WEIGHT GAIN (GRAMS)

GROUP 2 1200 PPM

FEMALE#	DAY OF LACTATION 1 - 4
2514	28
2515	20
2516	16
2517	22
2518	17
2519	14
2520	24
2521	25
2522	20
2523	16
2524	17
MEAN	20
S.D.	4.5
N	11

APPENDIX V

PROPANE: COMBINED REPEATED-EXPOSURE TOXICITY, REPRODUCTION AND NEUROTOXICITY SCREENING IN RATS VIA WHOLE-BODY INHALATION EXPOSURES

INDIVIDUAL MATERNAL LACTATION BODY WEIGHT GAIN (GRAMS)

GROUP 3 4000 PPM

	DAY OF LACTATION
FEMALE#	1 - 4
3513	-50
3514	3
3515	10
3516	10
3517	25
3518	6
3519	18
3520	14
3521	8
3523	-2
3524	10
MEAN	5
S.D.	19.5
N	11

APPENDIX V

PROPANE: COMBINED REPEATED-EXPOSURE TOXICITY, REPRODUCTION AND NEUROTOXICITY SCREENING IN RATS VIA WHOLE-BODY INHALATION EXPOSURES

INDIVIDUAL MATERNAL LACTATION BODY WEIGHT GAIN (GRAMS)

GROUP 4 12000 PPM

	DAY OF LACTATION
FEMALE#	1 - 4
4513	30
4514	19
4515	12
4516	19
4517	14
4518	17
4519	-59
4520	20
4521	-6
4522	11
4523	28
MEAN	10
S.D.	24.7
N	11

APPENDIX W

PROPANE: COMBINED REPEATED-EXPOSURE TOXICITY, REPRODUCTION AND NEUROTOXICITY SCREENING IN RATS VIA WHOLE-BODY INHALATION EXPOSURES

INDIVIDUAL FEED CONSUMPTION (GRAMS/KG/DAY)

FEMALES GROUP 1 0 PPM

	DAY OF STUDY					
ANIMAL#	0	7	14	35	42	49
1513	87	77	74			
1514	95	83	75			
1515	88	70	72			
1516	87	85	74			
1517	97	87	76			
1518	CF	CF	83			
1519	90	76	76			
1520	88	75	80			
1521	92	76	73			
1522	87	84	74			
1523	95	78	74			
1524	93	77	79			
MEAN	91	79	76			
S.D.	3.8	5.0	3.3			
N	11	11	12			

CF=Contaminated Feeder

APPENDIX W

PROPANE: COMBINED REPEATED-EXPOSURE TOXICITY, REPRODUCTION AND NEUROTOXICITY SCREENING IN RATS VIA WHOLE-BODY INHALATION EXPOSURES

INDIVIDUAL FEED CONSUMPTION (GRAMS/KG/DAY)

FEMALES GROUP 2 1200 PPM

	DAY OF STUDY					
ANIMAL#	0	7	14	35	42	49
2513	93	83	76	72	69	65
2514	85	68	71			
2515	103	74	73			
2516	89	82	79			
2517	91	75	78			
2518	96	84	86			
2519	95	84	89			
2520	98	76	75			
2521	86	78	73			
2522	94	78	79			
2523	99	79	79			
2524	97	80	80			
MEAN	94	78	78	72	69	65
S.D.	5.5	4.7	5.2	0.0	0.0	0.0
N	12	12	12	1	1	1

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APPENDIX W

PROPANE: COMBINED REPEATED-EXPOSURE TOXICITY, REPRODUCTION AND NEUROTOXICITY SCREENING IN RATS VIA WHOLE-BODY INHALATION EXPOSURES

INDIVIDUAL FEED CONSUMPTION (GRAMS/KG/DAY)

FEMALES GROUP 3 4000 PPM

	DAY OF STUDY					
ANIMAL#	0	7	14	35	42	49
3513	89	74	71			
3514	89	76	72			
3515	100	80	75			
3516	91	76	76			
3517	88	79	79			
3518	98	88	80			
3519	87	78	81			
3520	99	83	80			
3521	104	81	77			
3522	99	80	79			
3523	99	83	79			
3524	91	73	71			
MEAN	95	79	77			
S.D.	5.7	4.2	3.6			
N	12	12	12			

APPENDIX W

PROPANE: COMBINED REPEATED-EXPOSURE TOXICITY, REPRODUCTION AND NEUROTOXICITY SCREENING IN RATS VIA WHOLE-BODY INHALATION EXPOSURES

INDIVIDUAL FEED CONSUMPTION (GRAMS/KG/DAY)

FEMALES GROUP 4 12000 PPM

	DAY OF STUDY					
ANIMAL#	0	7	14	35	42	49
4513	101	78	83			
4514	106	85	79			
4515	93	77	72			
4516	96	77	78			
4517	103	78	81			
4518	92	82	80			
4519	96	82	75			
4520	95	76	81			
4521	103	84	81			
4522	97	82	75			
4523	88	76	70			
4524	101	83	77			
MEAN	97	80	78			
S.D.	5.2	3.2	3.9			
N	12	12	12			

APPENDIX X

PROPANE: COMBINED REPEATED-EXPOSURE TOXICITY, REPRODUCTION AND NEUROTOXICITY SCREENING IN RATS VIA WHOLE-BODY INHALATION EXPOSURES

INDIVIDUAL GESTATION FEED CONSUMPTION -- (GRAMS/KG/DAY)

GROUP 1 0 PPM

ANIMAL#	DAY OF GESTATION 0 - 7	7 - 14	14 - 20	0 - 20
1513	77	73	66	72
1514	80	76	64	74
1515	78	76	66	73
1516	85	72	71	76
1517	73	77	77	76
1518	86	75	62	74
1519	82	75	67	75
1520	88	79	69	79
1521	78	73	68	73
1522	77	72	64	71
1523	77	78	70	75
1524	87	75	71	78
MEAN	81	75	68	75
S.D.	4.8	2.3	4.0	2.2
N	12	12	12	12

CF=Contaminated Feeder

Huntingdon Life Sciences 03-4245S
SATELLITE STUDY

APPENDIX X

PROPANE: COMBINED REPEATED-EXPOSURE TOXICITY, REPRODUCTION AND NEUROTOXICITY SCREENING IN RATS VIA WHOLE-BODY INHALATION EXPOSURES

INDIVIDUAL GESTATION FEED CONSUMPTION -- (GRAMS/KG/DAY)

GROUP 2 1200 PPM

ANIMAL#	DAY OF GESTATION 0 - 7	7 - 14	14 - 20	0 - 20
2513x NP				
2514	75	71	67	71
2515	82	78	66	75
2516	79	79	65	74
2517	89	87	74	83
2518	87	85	73	82
2519	85	78	68	77
2520	79	84	69	77
2521	76	70	69	72
2522	93	84	73	83
2523	83	79	70	77
2524	84	82	73	80
MEAN	83	80	70	77
S.D.	5.6	5.4	3.1	4.2
N	11	11	11	11

NP=NOT PREGNANT x=EXCLUDED FROM MEAN

APPENDIX X

PROPANE: COMBINED REPEATED-EXPOSURE TOXICITY, REPRODUCTION AND NEUROTOXICITY SCREENING IN RATS VIA WHOLE-BODY INHALATION EXPOSURES

INDIVIDUAL GESTATION FEED CONSUMPTION -- (GRAMS/KG/DAY)

GROUP 3 4000 PPM

	DAY OF GESTATION			
ANIMAL#	0 - 7	7 - 14	14 - 20	0 - 20
3513	75	65	65	68
3514	79	76	69	75
3515	81	83	73	79
3516	88	82	67	79
3517	80	74	67	74
3518	87	78	68	78
3519	88	82	68	80
3520	84	75	68	76
3521	82	76	69	76
3522	82	73	60	72
3523	87	86	71	81
3524	81	82	74	79
MEAN	83	78	68	76
S.D.	4.0	5.8	3.6	3.8
N	12	12	12	12

APPENDIX X

PROPANE: COMBINED REPEATED-EXPOSURE TOXICITY, REPRODUCTION AND NEUROTOXICITY SCREENING IN RATS VIA WHOLE-BODY INHALATION EXPOSURES

INDIVIDUAL GESTATION FEED CONSUMPTION -- (GRAMS/KG/DAY)

GROUP 4 12000 PPM

	DAY OF GESTATION			
ANIMAL#	0 - 7	7 - 14	14 - 20	0 - 20
4513	84	79	72	78
4514	88	80	73	81
4515	81	72	64	72
4516	89	83	72	82
4517	87	84	75	82
4518	85	73	70	76
4519	78	73	65	72
4520	87	81		84
4521	95	86	70	84
4522	86	83	70	80
4523	81	71	74	75
4524	84	81	61	76
MEAN	85	79	70	78
S.D.	4.4	5.2	4.4	4.1
N	12	12	11	12

APPENDIX Y

PROPANE: COMBINED REPEATED-EXPOSURE TOXICITY, REPRODUCTION AND NEUROTOXICITY SCREENING IN RATS VIA WHOLE-BODY INHALATION EXPOSURES

INDIVIDUAL MATERNAL LACTATION FEED CONSUMPTION -- (GRAMS/KG/DAY)

GROUP 1 0 PPM

ANIMAL#	DAY OF LACTATION 1 - 4
1513	162
1514	81
1515	183
1516	118
1517	88
1518	126
1519	127
1520	116
1521	114
1522	103
1523	123
1524	101
MEAN	120
S.D.	28.7
N	12

APPENDIX Y

PROPANE: COMBINED REPEATED-EXPOSURE TOXICITY, REPRODUCTION AND NEUROTOXICITY SCREENING IN RATS VIA WHOLE-BODY INHALATION EXPOSURES

INDIVIDUAL MATERNAL LACTATION FEED CONSUMPTION -- (GRAMS/KG/DAY)

GROUP 2 1200 PPM

ANIMAL#	DAY OF LACTATION 1 - 4
2514	131
2515	136
2516	109
2517	121
2518	114
2519	109
2520	176
2521	130
2522	162
2523	132
2524	128
MEAN	132
S.D.	20.8
N	11

APPENDIX Y

PROPANE: COMBINED REPEATED-EXPOSURE TOXICITY, REPRODUCTION AND NEUROTOXICITY SCREENING IN RATS VIA WHOLE-BODY INHALATION EXPOSURES

INDIVIDUAL MATERNAL LACTATION FEED CONSUMPTION -- (GRAMS/KG/DAY)

GROUP 3 4000 PPM

ANIMAL#	DAY OF LACTATION 1 - 4
3513	88
3514	108
3515	130
3516	87
3517	126
3518	96
3519	104
3520	117
3521	106
3523	77
3524	104
MEAN	104
S.D.	16.5
N	11

APPENDIX Y

PROPANE: COMBINED REPEATED-EXPOSURE TOXICITY, REPRODUCTION
AND NEUROTOXICITY SCREENING IN RATS VIA WHOLE-BODY
INHALATION EXPOSURES

INDIVIDUAL MATERNAL LACTATION FEED CONSUMPTION -- (GRAMS/KG/DAY)

GROUP 4 12000 PPM

ANIMAL#	DAY OF LACTATION 1 - 4
4513	141
4514	125
4515	110
4516	120
4517	146
4518	120
4519	75
4520	105
4521	100
4522	108
4523	135
MEAN	117
S.D.	20.4
N	11

APPENDIX Z

PROPANE: COMBINED REPEATED-EXPOSURE TOXICITY, REPRODUCTION AND NEUROTOXICITY SCREENING IN RATS VIA WHOLE-BODY INHALATION EXPOSURES

INDIVIDUAL ESTROUS CYCLE DATA

GROUP 1 0 PPM

	DAY OF EVALUATION													
FEMALE#	15	16	17	18	19	20	21	22	23	24	25	26	27	28
1513	S													
1514	D	D	D	C										
1515	D	D	P	C										
1516	D	D	D	S										
1517	D	S												
1518	D	D	C											
1519	C													
1520	E	C												
1521	D	P	S											
1522	M	D	D	C										
1523	M	D	D	C										
1524	S													

D=DIESTRUS M=METESTRUS P=PROESTRUS E=ESTRUS S=SPERM C=COPULATORY PLUG

APPENDIX Z

PROPANE: COMBINED REPEATED-EXPOSURE TOXICITY, REPRODUCTION AND NEUROTOXICITY SCREENING IN RATS VIA WHOLE-BODY INHALATION EXPOSURES

INDIVIDUAL ESTROUS CYCLE DATA

GROUP 2 1200 PPM

	DAY OF EVALUATION													
FEMALE#	15	16	17	18	19	20	21	22	23	24	25	26	27	28
2513	P	E	M	D	D	E	D	D	D	E	D	D	D	E
2514	D	D	E	D	D	D	S							
2515	D	D	D	C										
2516	E	C												
2517	S													
2518	S													
2519	S													
2520	D	D	D	D	D	D	D	D	D	D	D	D	D	S
2521	M	D	D	C										
2522	D	D	P	C										
2523	D	S												
2524	D	D	D	S										

D=DIESTRUS M=METESTRUS P=PROESTRUS E=ESTRUS S=SPERM C=COPULATORY PLUG

APPENDIX Z

PROPANE: COMBINED REPEATED-EXPOSURE TOXICITY, REPRODUCTION
AND NEUROTOXICITY SCREENING IN RATS VIA WHOLE-BODY
INHALATION EXPOSURES

INDIVIDUAL ESTROUS CYCLE DATA

GROUP 3 4000 PPM

	DAY OF EVALUATION													
FEMALE#	15	16	17	18	19	20	21	22	23	24	25	26	27	28
3513	D	D	S											
3514	S													
3515	D	P	C											
3516	D	C												
3517	S													
3518	D	D	D	C										
3519	S													
3520	D	C												
3521	M	D	D	S										
3522	D	P	S											
3523	S													
3524	M	D	P	S										

D=DIESTRUS M=METESTRUS P=PROESTRUS E=ESTRUS S=SPERM C=COPULATORY PLUG

APPENDIX Z

PROPANE: COMBINED REPEATED-EXPOSURE TOXICITY, REPRODUCTION
AND NEUROTOXICITY SCREENING IN RATS VIA WHOLE-BODY
INHALATION EXPOSURES

INDIVIDUAL ESTROUS CYCLE DATA

GROUP 4 12000 PPM

	DAY OF EVALUATION													
FEMALE#	15	16	17	18	19	20	21	22	23	24	25	26	27	28
4513	S													
4514	D	P	S											
4515	S													
4516	C													
4517	M	D	D	C										
4518	D	D	D	S										
4519	D	D	C											
4520	M	D	D	S										
4521	D	P	C											
4522	D	D	P	S										
4523	D	S												
4524	D	D	P	S										

D=DIESTRUS M=METESTRUS P=PROESTRUS E=ESTRUS S=SPERM C=COPULATORY PLUG

APPENDIX AA

PROPANE: COMBINED REPEATED-EXPOSURE TOXICITY, REPRODUCTION AND NEUROTOXICITY SCREENING IN RATS VIA WHOLE-BODY INHALATION EXPOSURES

INDIVIDUAL MATING ASSIGNMENTS

GROUP 1 0 PPM

Female No.	Male No.	Sperm/Plug	Outcome	Date of Cohabitation	Date of Insemination	Date of Parturition
1513	1001	+	P	2-FEB-04	3-FEB-04	25-FEB-04
1514	1002	+	P	2-FEB-04	6-FEB-04	28-FEB-04
1515	1003	+	P	2-FEB-04	6-FEB-04	28-FEB-04
1516	1004	+	P	2-FEB-04	6-FEB-04	28-FEB-04
1517	1005	+	P	2-FEB-04	4-FEB-04	26-FEB-04
1518	1006	+	P	2-FEB-04	5-FEB-04	27-FEB-04
1519	1007	+	P	2-FEB-04	3-FEB-04	25-FEB-04
1520	1008	+	P	2-FEB-04	4-FEB-04	26-FEB-04
1521	1009	+	P	2-FEB-04	5-FEB-04	27-FEB-04
1522	1010	+	P	2-FEB-04	6-FEB-04	28-FEB-04
1523	1011	+	P	2-FEB-04	6-FEB-04	27-FEB-04
1524	1012	+	P	2-FEB-04	3-FEB-04	24-FEB-04

+ = Sperm/Plug Positive - = Sperm/Plug Negative N = Not Mated

P=PREGNANT

APPENDIX AA

PROPANE: COMBINED REPEATED-EXPOSURE TOXICITY, REPRODUCTION AND NEUROTOXICITY SCREENING IN RATS VIA WHOLE-BODY INHALATION EXPOSURES

INDIVIDUAL MATING ASSIGNMENTS

GROUP 2 1200 PPM

Female No.	Male No.	Sperm/Plug	Outcome	Date of Cohabitation	Date of Insemination	Date of Parturition
2513	2001	-	NP	2-FEB-04		
2514	2002	+	P	2-FEB-04	9-FEB-04	2-MAR-04
2515	2003	+	P	2-FEB-04	6-FEB-04	28-FEB-04
2516	2004	+	P	2-FEB-04	4-FEB-04	26-FEB-04
2517	2005	+	P	2-FEB-04	3-FEB-04	25-FEB-04
2518	2006	+	P	2-FEB-04	3-FEB-04	25-FEB-04
2519	2007	+	P	2-FEB-04	3-FEB-04	24-FEB-04
2520	2008	+	P	2-FEB-04	16-FEB-04	9-MAR-04
2521	2009	+	P	2-FEB-04	6-FEB-04	28-FEB-04
2522	2010	+	P	2-FEB-04	6-FEB-04	28-FEB-04
2523	2011	+	P	2-FEB-04	4-FEB-04	26-FEB-04
2524	2012	+	P	2-FEB-04	6-FEB-04	28-FEB-04

+ = Sperm/Plug Positive - = Sperm/Plug Negative N = Not Mated

NP=NOT PREGNANT P=PREGNANT

APPENDIX AA

PROPANE: COMBINED REPEATED-EXPOSURE TOXICITY, REPRODUCTION AND NEUROTOXICITY SCREENING IN RATS VIA WHOLE-BODY INHALATION EXPOSURES

INDIVIDUAL MATING ASSIGNMENTS

GROUP 3 4000 PPM

Female No.	Male No.	Sperm/Plug	Outcome	Date of Cohabitation	Date of Insemination	Date of Parturition
3513	3001	+	P	2-FEB-04	5-FEB-04	27-FEB-04
3514	3002	+	P	2-FEB-04	3-FEB-04	24-FEB-04
3515	3003	+	P	2-FEB-04	5-FEB-04	27-FEB-04
3516	3004	+	P	2-FEB-04	4-FEB-04	26-FEB-04
3517	3005	+	P	2-FEB-04	3-FEB-04	24-FEB-04
3518	3006	+	P	2-FEB-04	6-FEB-04	27-FEB-04
3519	3007	+	P	2-FEB-04	3-FEB-04	25-FEB-04
3520	3008	+	P	2-FEB-04	4-FEB-04	26-FEB-04
3521	3009	+	P	2-FEB-04	6-FEB-04	28-FEB-04
3522	3010	+	P	2-FEB-04	5-FEB-04	27-FEB-04
3523	3011	+	P	2-FEB-04	3-FEB-04	25-FEB-04
3524	3012	+	P	2-FEB-04	6-FEB-04	27-FEB-04

+ = Sperm/Plug Positive - = Sperm/Plug Negative N = Not Mated

P=PREGNANT

APPENDIX AA

PROPANE: COMBINED REPEATED-EXPOSURE TOXICITY, REPRODUCTION AND NEUROTOXICITY SCREENING IN RATS VIA WHOLE-BODY INHALATION EXPOSURES

INDIVIDUAL MATING ASSIGNMENTS

GROUP 4 12000 PPM

Female No.	Male No.	Sperm/Plug	Outcome	Date of Cohabitation	Date of Insemination	Date of Parturition
4513	4001	+	P	2-FEB-04	3-FEB-04	25-FEB-04
4514	4002	+	P	2-FEB-04	5-FEB-04	26-FEB-04
4515	4003	+	P	2-FEB-04	3-FEB-04	24-FEB-04
4516	4004	+	P	2-FEB-04	3-FEB-04	24-FEB-04
4517	4005	+	P	2-FEB-04	6-FEB-04	28-FEB-04
4518	4006	+	P	2-FEB-04	6-FEB-04	28-FEB-04
4519	4007	+	P	2-FEB-04	5-FEB-04	27-FEB-04
4520	4008	+	P	2-FEB-04	6-FEB-04	28-FEB-04
4521	4009	+	P	2-FEB-04	5-FEB-04	27-FEB-04
4522	4010	+	P	2-FEB-04	6-FEB-04	27-FEB-04
4523	4011	+	P	2-FEB-04	4-FEB-04	25-FEB-04
4524	4012	+	P	2-FEB-04	6-FEB-04	28-FEB-04

+ = Sperm/Plug Positive - = Sperm/Plug Negative N = Not Mated

P=PREGNANT

APPENDIX BB

PROPANE: COMBINED REPEATED-EXPOSURE TOXICITY, REPRODUCTION AND NEUROTOXICITY SCREENING IN RATS VIA WHOLE-BODY INHALATION EXPOSURES

INDIVIDUAL DELIVERY AND LITTER DATA

GROUP 1 0 PPM

	LITTER DELIVERED			NUMBER OF LIVE PUPS DAYS						DURATION OF	TOTAL	TOTAL	PRE-	POST-
				0		1		4		GESTATION	CORPORA	IMPLAN-	IMPLAN-	IMPLAN-
	LIVE	DEAD	TOTAL							(DAYS)	LUTEA	TATIONS	TATION LOSS	TATION LOSS
FEMALE#	N	N	N	M	F	M	F	M	F	N	N	N	N	N
1513	14	0	14	7	7	7	7	7	7	22	15	14	1	0
1514	11	0	11	7	4	7	4	7	4	22	13	11	2	0
1515	12	0	12	4	8	4	8	4	8	22	12	12	0	0
1516	14	0	14	11	3	11	3	11	3	22	16	16	0	2
1517	10	0	10	5	5	5	5	5	5	22	13	11	2	1
1518	14	0	14	6	8	6	8	6	8	22	14	14	0	0
1519	16	0	16	9	7	9	7	9	7	22	16	16	0	0
1520	14	0	14	6	8	5	8	5	8	22	17	16	1	2
1521	16	0	16	9	7	9	7	9	7	22	16	16	0	0
1522	14	0	14	5	9	4	9	4	9	22	15	14	1	0
1523	13	0	13	5	8	5	8	5	8	21	16	15	1	2
1524	17	0	17	9	8	9	8	9	8	21	17	17	0	0
MEAN	13.8	0.0	13.8	6.9	6.8	6.8	6.8	6.8	6.8	21.8	15.0	14.3	0.7	0.6
S.D.	2.1	0.0	2.1	2.2	1.9	2.3	1.9	2.3	1.9	0.4	1.6	2.1	0.8	0.9
N	12	12	12	12	12	12	12	12	12	12	12	12	12	12

APPENDIX BB

PROPANE: COMBINED REPEATED-EXPOSURE TOXICITY, REPRODUCTION AND NEUROTOXICITY SCREENING IN RATS VIA WHOLE-BODY INHALATION EXPOSURES

INDIVIDUAL DELIVERY AND LITTER DATA

GROUP 2 1200 PPM

	LITTER DELIVERED			NUMBER OF LIVE PUPS DAYS						DURATION OF GESTATION	TOTAL CORPORA	TOTAL IMPLAN-	PRE-IMPLAN-	POST-IMPLAN-
	LIVE	DEAD	TOTAL	0		1		4		(DAYS)	LUTEA	TATIONS	TATION LOSS	TATION LOSS
FEMALE#	N	N	N	M	F	M	F	M	F	N	N	N	N	N
2513x NP														
2514	13	0	13	6	7	6	7	6	7	22	13	13	0	0
2515	17	0	17	9	8	9	8	9	8	22	17	17	0	0
2516	16	0	16	7	9	7	9	7	8	22	18	17	1	1
2517	16	0	16	8	8	8	8	8	8	21	16	16	0	0
2518	17	0	17	9	8	9	8	9	8	22	17	17	0	0
2519	16	0	16	6	10	6	10	6	10	22	16	16	0	0
2520	14	0	14	8	6	8	6	8	6	22	18	16	2	2
2521	13	0	13	9	4	9	4	9	4	22	14	13	1	0
2522	15	0	15	7	8	7	8	7	8	22	16	15	1	0
2523	13	0	13	4	9	4	9	4	9	22	13	13	0	0
2524	17	0	17	7	10	7	10	7	10	22	20	18	2	1
MEAN	15.2	0.0	15.2	7.3	7.9	7.3	7.9	7.3	7.8	21.9	16.2	15.5	0.6	0.4
S.D.	1.7	0.0	1.7	1.6	1.8	1.6	1.8	1.6	1.7	0.3	2.1	1.8	0.8	0.7
N	11	11	11	11	11	11	11	11	11	11	11	11	11	11

NP=NOT PREGNANT x=EXCLUDED FROM MEAN

APPENDIX BB

PROPANE: COMBINED REPEATED-EXPOSURE TOXICITY, REPRODUCTION AND NEUROTOXICITY SCREENING IN RATS VIA WHOLE-BODY INHALATION EXPOSURES

INDIVIDUAL DELIVERY AND LITTER DATA

GROUP 3 4000 PPM

	LITTER DELIVERED			NUMBER OF LIVE PUPS DAYS						DURATION OF GESTATION	TOTAL CORPORA	TOTAL IMPLAN-	PRE-IMPLAN-	POST-IMPLAN-
	LIVE	DEAD[a]	TOTAL	0		1		4		(DAYS)	LUTEA	TATIONS	TATION LOSS	TATION LOSS
FEMALE#	N	N	N	M	F	M	F	M	F	N	N	N	N	N
3513	12	0	12	2	10	2	10	2	10	22	13	13	0	1
3514	11	0	11	8	3	8	2	8	2	21	12	12	0	1
3515	16	0	16	9	7	9	6	9	6	22	17	16	1	0
3516	14	0	14	6	8	6	8	6	8	22	15	15	0	1
3517	13	0	13	8	5	8	5	8	5	21	14	13	1	0
3518	15	0	15	8	7	8	7	8	7	21	18	16	2	1
3519	10	0	10	4	6	4	6	4	6	22	14	13	1	3
3520	15	0	15	6	9	6	9	6	9	22	17	17	0	2
3521	14	0	14	5	9	4	9	4	9	22	15	14	1	0
3522	4[b]	13	17	2	1	0	0	0	0	22	19	19	0	15
3523	7	0	7	4	3	4	3	4	3	22	16	7	9	0
3524	17	0	17	11	6	11	5	11	5	21	18	18	0	1
MEAN	12.3	1.1	13.4	6.1	6.2	6.4	6.4	6.4	6.4	21.7	15.7	14.4	1.3	2.1
S.D.	3.8	3.8	3.0	2.8	2.8	2.7	2.5	2.7	2.5	0.5	2.1	3.2	2.5	4.2
N	12	12	12	12	12	11	11	11	11	12	12	12	12	12

[a]The number of dead pups includes those that were stillborn or cannibalized on Day 0.

[b]The number of live pups includes 1 pup of uncertain sex.

Huntingdon Life Sciences 03-4245S
SATELLITE STUDY

APPENDIX BB

PROPANE: COMBINED REPEATED-EXPOSURE TOXICITY, REPRODUCTION AND NEUROTOXICITY SCREENING IN RATS VIA WHOLE-BODY INHALATION EXPOSURES

INDIVIDUAL DELIVERY AND LITTER DATA

GROUP 4 12000 PPM

	LITTER DELIVERED			NUMBER OF LIVE PUPS DAYS						DURATION OF GESTATION	TOTAL CORPORA	TOTAL IMPLAN-	PRE- IMPLAN-	POST- IMPLAN-
	LIVE	DEAD[a]	TOTAL	0		1		4		(DAYS)	LUTEA	TATIONS	TATION LOSS	TATION LOSS
FEMALE#	N	N	N	M	F	M	F	M	F	N	N	N	N	N
4513	15	0	15	7	8	7	8	7	8	22	16	16	0	1
4514	14	0	14	7	7	7	7	7	7	21	15	15	0	1
4515	13	0	13	4	9	4	9	4	9	21	14	13	1	0
4516	14	0	14	6	8	6	8	6	8	21	15	14	1	0
4517	16	2	18	8	8	8	8	8	8	22	19	19	0	3
4518	14	0	14	6	8	6	8	6	8	22	15	15	0	1
4519	15	0	15	12	3	12	3	12	3	22	16	16	0	1
4520	13	3	16	5	8	5	8	5	8	22	16	16	0	3
4521	17	0	17	8	9	8	9	8	9	22	19	17	2	0
4522	15	0	15	7	8	7	8	6	8	21	16	16	0	1
4523	13	0	13	5	8	5	8	5	8	21	14	14	0	1
4524	2	11	13	2	0	0	0	0	0	22	15	15	0	13
MEAN	13.4	1.3	14.8	6.4	7.0	6.8	7.6	6.7	7.6	21.6	15.8	15.5	0.3	2.1
S.D.	3.8	3.2	1.6	2.5	2.7	2.1	1.6	2.1	1.6	0.5	1.6	1.6	0.7	3.6
N	12	12	12	12	12	11	11	11	11	12	12	12	12	12

[a]The number of dead pups includes those that were stillborn or cannibalized on Day 0.

APPENDIX CC

PROPANE: COMBINED REPEATED-EXPOSURE TOXICITY, REPRODUCTION AND NEUROTOXICITY SCREENING IN RATS VIA WHOLE-BODY INHALATION EXPOSURES

INDIVIDUAL PUP SEX AND STATUS DURING LACTATION

GROUP 1 0 PPM

FEMALE#	PUP # 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
1513	MK 4	MK 4	MK 4	MK 4	MK 4	MK 4	MK 4	FK 4	FK 4	FK 4	FK 4	FK 4	FK 4	FK 4									
1514	MK 4	MK 4	MK 4	MK 4	MK 4	MK 4	FK 4	FK 4	FK 4	FK 4													
1515	MK 4	MK 4	MK 4	MK 4	FK 4	FK 4	FK 4	FK 4	FK 4	FK 4	FK 4	FK 4	FK 4										
1516	MK 4	MK 4	MK 4	MK 4	MK 4	MK 4	MK 4	MK 4	MK 4	MK 4	MK 4	MK 4	FK 4	FK 4	FK 4								
1517	MK 4	MK 4	MK 4	MK 4	MK 4	MK 4	FK 4	FK 4	FK 4	FK 4	FK 4												
1518	MK 4	MK 4	MK 4	MK 4	MK 4	MK 4	MK 4	FK 4	FK 4	FK 4	FK 4	FK 4	FK 4	FK 4									
1519	MK 4	MK 4	MK 4	MK 4	MK 4	MK 4	MK 4	MK 4	MK 4	MK 4	MK 4	FK 4	FK 4	FK 4	FK 4	FK 4	FK 4						
1520	MK 4	MK 4	MK 4	MK 4	MK 4	MK 4	MM 1	FK 4	FK 4	FK 4	FK 4	FK 4	FK 4	FK 4	FK 4	FK 4							
1521	MK 4	MK 4	MK 4	MK 4	MK 4	MK 4	MK 4	MK 4	MK 4	MK 4	FK 4	FK 4	FK 4	FK 4	FK 4	FK 4	FK 4						
1522	MK 4	MK 4	MK 4	MD 1	MK 4	FK 4	FK 4	FK 4	FK 4	FK 4	FK 4	FK 4	FK 4	FK 4									
1523	MK 4	MK 4	MK 4	MK 4	MK 4	MK 4	FK 4	FK 4	FK 4	FK 4	FK 4	FK 4	FK 4	FK 4									
1524	MK 4	MK 4	MK 4	MK 4	MK 4	MK 4	MK 4	MK 4	MK 4	MK 4	MK 4	FK 4	FK 4	FK 4	FK 4	FK 4	FK 4	FK 4	FK 4	FK 4	FK 4	FK 4	FK 4

SEX CODE PRECEDES PUP STATUS CODE. NUMERICAL VALUE INDICATES DAY OF LACTATION.
SEX CODES: M-MALE F-FEMALE U-UNCERTAIN
PUP STATUS CODES: A-ALIVE D-DIED M-MISSING K-SCHEDULED SACRIFICE

APPENDIX CC

PROPANE: COMBINED REPEATED-EXPOSURE TOXICITY, REPRODUCTION
AND NEUROTOXICITY SCREENING IN RATS VIA WHOLE-BODY
INHALATION EXPOSURES

INDIVIDUAL PUP SEX AND STATUS DURING LACTATION

GROUP 2 1200 PPM

FEMALE#	PUP # 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
2514	MK	4	MK	4	MK	4	MK	4	MK	4	MK	4	FK	4	FK	4	FK	4	FK	4	FK	4	FK	4	FK	4										
2515	MK	4	MK	4	MK	4	MK	4	MK	4	MK	4	MK	4	MK	4	FK	4	FK	4	FK	4	FK	4	FK	4	FK	4	FK	4	FK	4			
2516	MK	4	MK	4	MK	4	MK	4	MK	4	MK	4	FK	4	FK	4	FK	4	FK	4	FK	4	FK	4	FK	4	FK	4	FM	3					
2517	MK	4	MK	4	MK	4	MK	4	MK	4	MK	4	MK	4	MK	4	FK	4	FK	4	FK	4	FK	4	FK	4	FK	4	FK	4					
2518	MK	4	MK	4	MK	4	MK	4	MK	4	MK	4	MK	4	MK	4	MK	4	FK	4	FK	4	FK	4	FK	4	FK	4	FK	4	FK	4	FK	4	
2519	MK	4	MK	4	MK	4	MK	4	MK	4	MK	4	FK	4	FK	4	FK	4	FK	4	FK	4	FK	4	FK	4	FK	4	FK	4	FK	4			
2520	MK	4	MK	4	MK	4	MK	4	MK	4	MK	4	MK	4	MK	4	FK	4	FK	4	FK	4	FK	4	FK	4	FK	4							
2521	FK	4	MK	4	MK	4	MK	4	MK	4	MK	4	MK	4	MK	4	MK	4	MK	4	FK	4	FK	4	FK	4									
2522	MK	4	MK	4	MK	4	MK	4	MK	4	MK	4	MK	4	FK	4	FK	4	FK	4	FK	4	FK	4	FK	4	FK	4							
2523	MK	4	MK	4	MK	4	MK	4	FK	4	FK	4	FK	4	FK	4	FK	4	FK	4	FK	4	FK	4	FK	4									
2524	MK	4	MK	4	MK	4	MK	4	MK	4	MK	4	MK	4	FK	4	FK	4	FK	4	FK	4	FK	4	FK	4	FK	4	FK	4	FK	4	FK	4	

SEX CODE PRECEDES PUP STATUS CODE. NUMERICAL VALUE INDICATES DAY OF LACTATION.
SEX CODES: M-MALE F-FEMALE U-UNCERTAIN
PUP STATUS CODES: A-ALIVE M-MISSING K-SCHEDULED SACRIFICE

APPENDIX CC

PROPANE: COMBINED REPEATED-EXPOSURE TOXICITY, REPRODUCTION AND NEUROTOXICITY SCREENING IN RATS VIA WHOLE-BODY INHALATION EXPOSURES

INDIVIDUAL PUP SEX AND STATUS DURING LACTATION

GROUP 3 4000 PPM

FEMALE#	PUP # 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
3513	MK 4	MK 4	FK 4	FK 4	FK 4	FK 4	FK 4	FK 4	FK 4	FK 4	FK 4	FK 4											
3514	MK 4	MK 4	MK 4	MK 4	MK 4	MK 4	MK 4	MK 4	FM 1	FK 4	FK 4												
3515	MK 4	MK 4	MK 4	MK 4	MK 4	MK 4	MK 4	MK 4	MK 4	FM 1	FK 4	FK 4	FK 4	FK 4	FK 4	FK 4							
3516	MK 4	MK 4	MK 4	MK 4	MK 4	MK 4	MK 4	FK 4	FK 4	FK 4	FK 4	FK 4	FK 4	FK 4	FK 4								
3517	MK 4	MK 4	MK 4	MK 4	MK 4	MK 4	MK 4	MK 4	MK 4	FK 4	FK 4	FK 4	FK 4	FK 4									
3518	MK 4	MK 4	MK 4	MK 4	MK 4	MK 4	MK 4	MK 4	MK 4	FK 4	FK 4	FK 4	FK 4	FK 4	FK 4	FK 4							
3519	MK 4	MK 4	MK 4	MK 4	FK 4	FK 4	FK 4	FK 4	FK 4	FK 4	FK 4												
3520	MK 4	MK 4	MK 4	MK 4	MK 4	MK 4	MK 4	FK 4	FK 4	FK 4	FK 4	FK 4	FK 4	FK 4	FK 4	FK 4							
3521	MK 4	MK 4	MK 4	MM 1	MK 4	FK 4	FK 4	FK 4	FK 4	FK 4	FK 4	FK 4	FK 4	FK 4	FK 4								
3522	FD 0	MZ 0	FZ 0	MD 0	MZ 0	MZ 0	MZ 0	FZ 0	MZ 0	MZ 0	MD 0	MS	MS	FS	FS	FS	UD 0						
3523	MK 4	MK 4	MK 4	MK 4	FK 4	FK 4	FK 4																
3524	MK 4	MK 4	MK 4	MK 4	MK 4	MK 4	MK 4	MK 4	MK 4	MK 4	MK 4	MK 4	FK 4	FK 4	FK 4	FD 1	FK 4	FK 4	FK 4				

SEX CODE PRECEDES PUP STATUS CODE. NUMERICAL VALUE INDICATES DAY OF LACTATION.
SEX CODES: M-MALE F-FEMALE U-UNCERTAIN
PUP STATUS CODES: A-ALIVE S-STILLBORN D-DIED Z-CANNIBALIZED M-MISSING K-SCHEDULED SACRIFICE

APPENDIX CC

PROPANE: COMBINED REPEATED-EXPOSURE TOXICITY, REPRODUCTION
AND NEUROTOXICITY SCREENING IN RATS VIA WHOLE-BODY
INHALATION EXPOSURES

INDIVIDUAL PUP SEX AND STATUS DURING LACTATION

GROUP 4 12000 PPM

FEMALE#	PUP # 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
4513	MK 4	MK 4	MK 4	MK 4	MK 4	MK 4	MK 4	FK 4	FK 4	FK 4	FK 4	FK 4	FK 4	FK 4	FK 4								
4514	MK 4	MK 4	MK 4	MK 4	MK 4	MK 4	MK 4	FK 4	FK 4	FK 4	FK 4	FK 4	FK 4	FK 4									
4515	MK 4	MK 4	MK 4	MK 4	FK 4	FK 4	FK 4	FK 4	FK 4	FK 4	FK 4	FK 4	FK 4										
4516	MK 4	MK 4	MK 4	MK 4	MK 4	MK 4	FK 4	FK 4	FK 4	FK 4	FK 4	FK 4	FK 4	FK 4									
4517	MS	MS	MK 4	MK 4	MK 4	MK 4	MK 4	MK 4	MK 4	MK 4	MK 4	FK 4	FK 4	FK 4	FK 4	FK 4	FK 4	FK 4	FK 4	FK 4	FK 4		
4518	MK 4	MK 4	MK 4	MK 4	MK 4	MK 4	FK 4	FK 4	FK 4	FK 4	FK 4	FK 4	FK 4	FK 4									
4519	MK 4	MK 4	MK 4	MK 4	MK 4	MK 4	MK 4	MK 4	MK 4	MK 4	MK 4	MK 4	FK 4	FK 4	FK 4								
4520	MS	FS	FS	MK 4	MK 4	MK 4	MK 4	MK 4	FK 4	FK 4	FK 4	FK 4	FK 4	FK 4	FK 4	FK 4							
4521	MK 4	MK 4	MK 4	MK 4	MK 4	MK 4	MK 4	MK 4	FK 4	FK 4	FK 4	FK 4	FK 4	FK 4	FK 4	FK 4	FK 4						
4522	MK 4	MD 2	MK 4	MK 4	MK 4	MK 4	MK 4	FK 4	FK 4	FK 4	FK 4	FK 4	FK 4	FK 4	FK 4								
4523	MK 4	MK 4	MK 4	MK 4	FK 4	FK 4	FK 4	FK 4	FK 4	FK 4	FK 4	FK 4	FK 4	MK 4									
4524	MD 0	MS	MD 0	FS	FS	FS	FS	FS	FS	FS	UZ 0	UZ 0	UZ 0										

SEX CODE PRECEDES PUP STATUS CODE. NUMERICAL VALUE INDICATES DAY OF LACTATION.
SEX CODES: M-MALE F-FEMALE U-UNCERTAIN
PUP STATUS CODES: A-ALIVE S-STILLBORN D-DIED Z-CANNIBALIZED K-SCHEDULED SACRIFICE

	Raw Data Listing of Gross Observations with Modifiers Satellite Study Preface	Appendix DD

Key to Abbreviations

LN	=	Lymph Node
Oviducts/Fallop	=	Oviducts/Fallopian Tubes
SC	=	Spinal Cord

Corresponding exposure levels for each group were as follows:

Group 1 - 0 ppm
Group 2 - 1200 ppm
Group 3 - 4000 ppm
Group 4 - 12000 ppm

Huntingdon Life Sciences
Princeton Research Center
East Millstone, New Jersey
Appendix DD - Satellite Study

Raw Data Listing of Gross Observations with Modifiers
Study number: 034245

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Animal number	Sex	Group/ Subgroup	Date data taken	Tissue / Observation(s) Locator, Color, General, Measurements, Severity levels			
1513	F	1/1	29-Feb-04	Within normal limits			
1514	F	1/1	03-Mar-04	Within normal limits			
1515	F	1/1		Urinary bladder			
			03-Mar-04	Calculus, , , Hard, 0.6 - 0.9 cm, Multiple			
				Tissues marked 'Within normal limits':			
			03-Mar-04	Adrenal Glands	Brain	Cecum	Cervical SC
				Colon	Duodenum	Femoral Marrow	Femur
				Heart	Ileum	Jejunum	Kidneys
				Larynx	Liver	Lumbar SC	Lungs
				Mammary-protocol	Mediastinal LN	Mesenteric LN	Nasopharynx
				Ovaries	Oviducts/Fallop	Parathyroid	Rectum/Low Colon
				Skin-protocol	Spleen	Sternal Marrow	Sternum
				Stomach	Thoracic SC	Thymus	Thyroid
				Tibial Nerve	Trachea	Uterus	Vagina
1516	F	1/1	03-Mar-04	Within normal limits			
1517	F	1/1	01-Mar-04	Within normal limits			
1518	F	1/1	02-Mar-04	Within normal limits			
1519	F	1/1	29-Feb-04	Within normal limits			
1520	F	1/1		Skin (other)			
			01-Mar-04	Hair Thin/Absent, Forepaw(s), , , , Severe			
				Tissues marked 'Within normal limits':			
			01-Mar-04	Adrenal Glands	Brain	Cecum	Cervical SC
				Colon	Duodenum	Femoral Marrow	Femur
				Heart	Ileum	Jejunum	Kidneys
				Larynx	Liver	Lumbar SC	Lungs
				Mammary-protocol	Mediastinal LN	Mesenteric LN	Nasopharynx
				Ovaries	Oviducts/Fallop	Parathyroid	Rectum/Low Colon
				Skin-protocol	Spleen	Sternal Marrow	Sternum
				Stomach	Thoracic SC	Thymus	Thyroid
				Tibial Nerve	Trachea	Urinary bladder	Uterus
				Vagina			
1521	F	1/1		Liver			
			02-Mar-04	Extra lobe, Medial lobe, , , ,			
				Tissues marked 'Within normal limits':			
			02-Mar-04	Adrenal Glands	Brain	Cecum	Cervical SC

Animal number	Sex	Group/ Subgroup	Date data taken	Tissue / Observation(s) Locator, Color, General, Measurements, Severity levels			
1521	F	1/1	02-Mar-04	Tissues marked 'Within normal limits':			
				Colon	Duodenum	Femoral Marrow	Femur
				Heart	Ileum	Jejunum	Kidneys
				Larynx	Lumbar SC	Lungs	Mammary-protocol
				Mediastinal LN	Mesenteric LN	Nasopharynx	Ovaries
				Oviducts/Fallop	Parathyroid	Rectum/Low Colon	Skin-protocol
				Spleen	Sternal Marrow	Sternum	Stomach
				Thoracic SC	Thymus	Thyroid	Tibial Nerve
				Trachea	Urinary bladder	Uterus	Vagina
1522	F	1/1	03-Mar-04	Within normal limits			
1523	F	1/1	02-Mar-04	Within normal limits			
1524	F	1/1	28-Feb-04	Within normal limits			
2513	F	2/1	13-Mar-04	Within normal limits			
2514	F	2/1	06-Mar-04	Within normal limits			
2515	F	2/1	03-Mar-04	Within normal limits			
2516	F	2/1	01-Mar-04	Within normal limits			
2517	F	2/1	29-Feb-04	Within normal limits			
2518	F	2/1	29-Feb-04	Within normal limits			
2519	F	2/1	28-Feb-04	Within normal limits			
2520	F	2/1	13-Mar-04	Within normal limits			
2521	F	2/1	03-Mar-04	Within normal limits			
2522	F	2/1	03-Mar-04	Within normal limits			
2523	F	2/1	01-Mar-04	Within normal limits			
2524	F	2/1	03-Mar-04	Within normal limits			
3513	F	3/1	02-Mar-04	Within normal limits			
3514	F	3/1	28-Feb-04	Within normal limits			

Animal number	Sex	Group/ Subgroup	Date data taken	Tissue / Observation(s) Locator, Color, General, Measurements, Severity levels
3515	F	3/1	02-Mar-04	Within normal limits
3516	F	3/1	01-Mar-04	Within normal limits
3517	F	3/1	28-Feb-04	Within normal limits
3518	F	3/1	02-Mar-04	Within normal limits
3519	F	3/1	29-Feb-04	Within normal limits
3520	F	3/1	01-Mar-04	Within normal limits
3521	F	3/1	03-Mar-04	Within normal limits
3522	F	3/1	02-Mar-04	Within normal limits
3523	F	3/1	29-Feb-04	Within normal limits
3524	F	3/1	02-Mar-04	Within normal limits
4513	F	4/1	29-Feb-04	Within normal limits
4514	F	4/1	01-Mar-04	Within normal limits
4515	F	4/1	28-Feb-04	Within normal limits
4516	F	4/1	28-Feb-04	Within normal limits
4517	F	4/1	03-Mar-04	Within normal limits
4518	F	4/1	03-Mar-04	Within normal limits
4519	F	4/1	02-Mar-04	Within normal limits
4520	F	4/1	03-Mar-04	Within normal limits
4521	F	4/1		Liver
			02-Mar-04	Extra lobe, Medial lobe, , , ,
				Tissues marked 'Within normal limits':
			02-Mar-04	Adrenal Glands, Brain, Cecum, Cervical SC, Colon, Duodenum, Femoral Marrow, Femur, Heart, Ileum, Jejunum, Kidneys

Animal number	Sex	Group/ Subgroup	Date data taken	Tissue / Observation(s) Locator, Color, General, Measurements, Severity levels			
4521	F	4/1	02-Mar-04	Tissues marked 'Within normal limits':			
				Larynx	Lumbar SC	Lungs	Mammary-protocol
				Mediastinal LN	Mesenteric LN	Nasopharynx	Ovaries
				Oviducts/Fallop	Parathyroid	Rectum/Low Colon	Skin-protocol
				Spleen	Sternal Marrow	Sternum	Stomach
				Thoracic SC	Thymus	Thyroid	Tibial Nerve
				Trachea	Urinary bladder	Uterus	Vagina
4522	F	4/1	02-Mar-04	Within normal limits			
4523	F	4/1	29-Feb-04	Within normal limits			
4524	F	4/1	03-Mar-04	Within normal limits			

	Individual Organ Weights Satellite Study Preface	Appendix EE

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Key to Abbreviations:

g	=	Grams
observ.	=	Observed
wt.	=	Weight

Corresponding exposure levels for each group were as follows:

Group 1 - 0 ppm
Group 2 - 1200 ppm
Group 3 - 4000 ppm
Group 4 - 12000 ppm

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Princeton Research Center
East Millstone, New Jersey
Appendix EE - Satellite Study

Summary statistics for absolute organ weights (g)
Study number: 034245

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Animal No/sex	Group/ Subgroup	Terminal Body wt. (g)	Adrenal Glands	Brain	Heart	Kidneys	Liver	Lungs
				F e m a l e	A n i m a l s			
1513/F	1/1	297.0	0.0857	2.1945	0.9996	2.6807	15.3802	2.0016
1514/F	1/1	298.3	0.0919	2.0303	1.0351	2.3573	13.4889	1.3662
1515/F	1/1	279.8	0.0713	1.9464	1.0186	2.6452	14.3402	1.3490
1516/F	1/1	311.1	0.0929	2.0382	1.0828	2.3475	13.6748	1.3538
1517/F	1/1	286.4	0.0942	2.1222	0.9862	2.5317	14.5169	1.5748
1518/F	1/1	273.2	0.0839	2.0167	0.9365	2.2931	13.4295	1.3008
1519/F	1/1	269.9	0.0818	2.0729	1.0458	2.6113	16.2277	1.8095
1520/F	1/1	296.3	0.0941	2.1191	1.0683	2.6485	15.4021	1.3190
1521/F	1/1	318.7	0.1265	2.0129	1.0608	2.4191	15.1042	1.3981
1522/F	1/1	296.3	0.0753	2.0089	1.0639	2.1074	12.2849	1.3816
1523/F	1/1	256.7	0.0619	2.0498	0.8805	1.9383	11.6137	1.2026
1524/F	1/1	302.2	0.0972	2.1220	1.1678	2.9188	16.3202	1.5043
M e a n:		290.5	0.0881	2.0612	1.0288	2.4582	14.3153	1.4634
Standard deviation:		17.9	0.0161	0.0678	0.0736	0.2707	1.4757	0.2305
Number of observ. :		(12)	(12)	(12)	(12)	(12)	(12)	(12)
2514/F	2/1	273.1	0.0561	1.9415	0.8252	2.1153	13.2504	1.2267
2515/F	2/1	310.7	0.0926	1.9449	1.0353	2.2767	15.6606	1.4727
2516/F	2/1	296.4	0.1112	2.0939	1.0471	2.3504	13.9657	1.4914
2517/F	2/1	297.2	0.0848	2.0605	1.1947	2.8155	15.7983	1.8520
2518/F	2/1	332.0	0.0978	2.2108	1.1723	2.9229	15.6343	2.2743
2519/F	2/1	268.4	0.0916	2.1443	1.1017	2.5581	15.0047	1.4447
2520/F	2/1	348.0	0.0756	2.0726	1.0204	2.2450	14.2497	1.4417
2521/F	2/1	308.6	0.0836	2.1463	1.0152	2.1578	14.2257	1.4609
2522/F	2/1	273.4	0.0794	1.9350	0.8071	2.2055	12.3444	1.3622
2523/F	2/1	267.6	0.0796	1.8646	0.9108	2.4199	12.7129	1.3283
2524/F	2/1	305.6	0.1066	2.0143	1.0705	2.2512	14.3996	1.5280
M e a n:		298.3	0.0872	2.0390	1.0182	2.3926	14.2951	1.5348
Standard deviation:		26.5	0.0153	0.1081	0.1261	0.2669	1.1810	0.2903
Number of observ. :		(11)	(11)	(11)	(11)	(11)	(11)	(11)
3513/F	3/1	216.5	0.0945	1.9713	0.8988	2.0034	10.1799	1.5435
3514/F	3/1	244.5	0.0781	2.1152	0.9004	2.0314	12.1316	1.4028
3515/F	3/1	317.2	0.1115	2.1209	0.9797	2.5069	14.9977	1.3314
3516/F	3/1	296.4	0.0897	2.0092	0.9231	2.4457	13.9718	1.5914
3517/F	3/1	284.8	0.0883	2.0239	1.0357	2.4721	13.9303	1.6054
3518/F	3/1	270.2	0.0789	1.9566	0.8507	2.0877	10.7700	1.4387
3519/F	3/1	306.1	0.0827	2.2751	1.0688	2.6341	15.0782	1.7810
3520/F	3/1	276.5	0.0861	1.8420	0.9338	2.2772	12.1588	1.2817
3521/F	3/1	296.0	0.0967	2.1495	0.9799	2.2610	13.1729	1.4896
3522/F	3/1	272.6	0.0711	1.9243	0.9228	2.6018	12.2382	1.6519
3523/F	3/1	302.4	0.0788	2.1747	1.1311	2.7139	13.7608	2.1396
3524/F	3/1	332.7	0.0790	2.2212	1.1301	2.2511	13.7651	1.5466
M e a n:		284.7	0.0863	2.0653	0.9796	2.3572	13.0129	1.5670
Standard deviation:		31.7	0.0109	0.1308	0.0928	0.2408	1.5457	0.2277

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Summary statistics for absolute organ weights (g)
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Animal No/sex	Group/ Subgroup	Terminal Body wt. (g)	Adrenal Glands	Brain	Heart	Kidneys	Liver	Lungs
Number of observ. :		(12)	(12)	(12)	(12)	(12)	(12)	(12)
4513/F	4/1	325.7	0.0738	2.2053	1.1819	2.5836	17.4952	1.8190
4514/F	4/1	290.0	0.0970	1.9525	0.9492	2.2945	12.5089	1.4094
4515/F	4/1	272.8	0.0890	2.3419	1.0498	2.3611	14.0744	1.5491
4516/F	4/1	298.3	0.0819	2.2072	1.0601	2.8056	14.8455	1.6204
4517/F	4/1	274.4	0.0756	2.0864	1.1604	2.0288	10.3492	1.4708
4518/F	4/1	312.1	0.0819	2.0746	1.0174	2.5613	13.8211	1.5103
4519/F	4/1	238.5	0.0901	2.0269	0.8172	2.1692	9.9208	1.4297
4520/F	4/1	305.5	0.0644	1.9615	1.0838	2.3997	13.3906	1.3647
4521/F	4/1	302.9	0.0855	2.0538	1.0786	2.3813	14.7867	1.5439
4522/F	4/1	318.1	0.1019	2.1966	1.1121	2.7891	15.2516	1.7257
4523/F	4/1	287.3	0.0917	1.9760	1.3237	2.3352	14.9439	1.9425
4524/F	4/1	240.9	0.0841	1.8711	0.7833	2.0594	11.2651	1.5520
M e a n:		288.9	0.0847	2.0795	1.0515	2.3974	13.5544	1.5781
Standard deviation:		28.0	0.0103	0.1356	0.1498	0.2522	2.2096	0.1730
Number of observ. :		(12)	(12)	(12)	(12)	(12)	(12)	(12)

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Summary statistics for absolute organ weights (g)
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Animal No/sex	Group/ Subgroup	Terminal Body wt. (g)	Ovary Left	Ovary Right	Spleen	Thymus	Uterus w/vagina
				Female Animals			
1513/F	1/1	297.0	0.0626	0.0843	0.6249	0.2868	0.9336
1514/F	1/1	298.3	0.0796	0.0749	0.6822	0.3446	0.8885
1515/F	1/1	279.8	0.0640	0.0632	0.6057	0.2036	0.9424
1516/F	1/1	311.1	0.0814	0.0841	0.7970	0.4374	1.1182
1517/F	1/1	286.4	0.0774	0.0760	0.5776	0.3194	0.7963
1518/F	1/1	273.2	0.0641	0.0587	0.5839	0.2317	0.8770
1519/F	1/1	269.9	0.0769	0.0837	0.6766	0.3038	1.0849
1520/F	1/1	296.3	0.0696	0.0861	0.6428	0.4348	1.2336
1521/F	1/1	318.7	0.0946	0.0823	0.5885	0.3002	0.8231
1522/F	1/1	296.3	0.0554	0.0655	0.6974	0.3310	1.0226
1523/F	1/1	256.7	0.0608	0.0660	0.5674	0.1158	0.9741
1524/F	1/1	302.2	0.0828	0.0858	0.6834	0.3061	1.3092
	Mean:	290.5	0.0724	0.0759	0.6440	0.3013	1.0003
Standard deviation:		17.9	0.0115	0.0100	0.0668	0.0897	0.1597
Number of observ. :		(12)	(12)	(12)	(12)	(12)	(12)
2514/F	2/1	273.1	0.0427	0.0363	0.5350	0.2288	0.8627
2515/F	2/1	310.7	0.0691	0.0635	0.7728	0.2603	0.8114
2516/F	2/1	296.4	0.1024	0.0934	0.7117	0.2477	0.9815
2517/F	2/1	297.2	0.0756	0.0848	0.7966	0.2916	1.0415
2518/F	2/1	332.0	0.0845	0.0787	0.9233	0.3447	1.2098
2519/F	2/1	268.4	0.0859	0.0885	0.5943	0.2215	1.2604
2520/F	2/1	348.0	0.0645	0.0816	0.4231	0.2473	1.3331
2521/F	2/1	308.6	0.0750	0.0585	0.6559	0.2934	0.8253
2522/F	2/1	273.4	0.0724	0.0599	0.6840	0.2424	0.9102
2523/F	2/1	267.6	0.0720	0.0672	0.6322	0.2463	0.7937
2524/F	2/1	305.6	0.0645	0.0700	0.6201	0.2653	0.8784
	Mean:	298.3	0.0735	0.0711	0.6681	0.2627	0.9916
Standard deviation:		26.5	0.0150	0.0165	0.1348	0.0354	0.1935
Number of observ. :		(11)	(11)	(11)	(11)	(11)	(11)
3513/F	3/1	216.5	0.0811	0.0828	0.5012	0.2057	0.9470
3514/F	3/1	244.5	0.0520	0.0634	0.5326	0.2540	0.9003
3515/F	3/1	317.2	0.0854	0.0661	0.6879	0.1963	0.8468
3516/F	3/1	296.4	0.0728	0.0420	0.7673	0.3142	0.9987
3517/F	3/1	284.8	0.0686	0.0691	0.6427	0.3116	0.9795
3518/F	3/1	270.2	0.0538	0.0662	0.5684	0.1558	1.0325
3519/F	3/1	306.1	0.0918	0.0743	0.7019	0.4601	1.1678
3520/F	3/1	276.5	0.0793	0.0521	0.5327	0.2111	0.6860
3521/F	3/1	296.0	0.0772	0.0632	0.7573	0.2309	0.9101
3522/F	3/1	272.6	0.0861	0.0783	0.5763	0.1295	1.0704
3523/F	3/1	302.4	0.0680	0.0782	0.6998	0.3387	0.9447
3524/F	3/1	332.7	0.0825	0.0830	0.7237	0.3492	1.1052
	Mean:	284.7	0.0749	0.0682	0.6410	0.2631	0.9658
Standard deviation:		31.7	0.0124	0.0123	0.0945	0.0943	0.1270

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Summary statistics for absolute organ weights (g)
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Animal No/sex	Group/ Subgroup	Terminal Body wt. (g)	Ovary Left	Ovary Right	Spleen	Thymus	Uterus w/vagina
Number of observ. :		(12)	(12)	(12)	(12)	(12)	(12)
4513/F	4/1	325.7	0.0872	0.0699	0.6954	0.3467	1.0774
4514/F	4/1	290.0	0.0891	0.0666	0.5869	0.2326	1.0350
4515/F	4/1	272.8	0.0636	0.0831	0.7299	0.2892	1.1788
4516/F	4/1	298.3	0.0715	0.0663	0.5838	0.1918	1.1655
4517/F	4/1	274.4	0.0694	0.0701	0.6804	0.2680	0.9074
4518/F	4/1	312.1	0.0738	0.0607	0.6289	0.3747	0.9080
4519/F	4/1	238.5	0.0632	0.0778	0.4242	0.1482	0.8734
4520/F	4/1	305.5	0.0622	0.0660	0.7388	0.3290	1.0532
4521/F	4/1	302.9	0.0708	0.0849	0.6744	0.2910	1.0297
4522/F	4/1	318.1	0.0979	0.0836	0.6245	0.3125	1.1096
4523/F	4/1	287.3	0.0696	0.0829	0.8261	0.4283	1.2019
4524/F	4/1	240.9	0.0790	0.0882	0.5181	0.1054	0.8618
M e a n:		288.9	0.0748	0.0750	0.6426	0.2765	1.0335
Standard deviation:		28.0	0.0113	0.0094	0.1070	0.0939	0.1213
Number of observ. :		(12)	(12)	(12)	(12)	(12)	(12)

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Princeton Research Center
East Millstone, New Jersey

Summary statistics for absolute organ weights (g)
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Appendix EE - Satellite Study (non-pregnant animals)

Animal No/sex	Group/ Subgroup	Terminal Body wt. (g)	Adrenal Glands	Brain	Heart	Kidneys	Liver	Lungs
				Female Animals				
2513/F	2/1	257.8	0.0781	2.0033	0.8074	2.1890	9.9327	1.4220
Mean:		257.8	0.0781	2.0033	0.8074	2.1890	9.9327	1.4220
Standard deviation:		0.0	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Number of observ. :		(1)	(1)	(1)	(1)	(1)	(1)	(1)

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Summary statistics for absolute organ weights (g)
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Appendix EE - Satellite Study (non-pregnant animals)

Animal No/sex	Group/ Subgroup	Terminal Body wt. (g)	Ovary Left	Ovary Right	Spleen	Thymus	Uterus w/vagina
				Female Animals			
2513/F	2/1	257.8	0.0512	0.0514	0.6526	0.3024	0.8070
Mean:		257.8	0.0512	0.0514	0.6526	0.3024	0.8070
Standard deviation:		0.0	0.0000	0.0000	0.0000	0.0000	0.0000
Number of observ. :		(1)	(1)	(1)	(1)	(1)	(1)

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Appendix EE - Satellite Study

Summary Statistics for % Organ to Body Weight
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Animal No/sex	Group/ Subgroup	Terminal Body wt. (g)	Adrenal Glands	Brain	Heart	Kidneys	Liver	Lungs
				Female Animals				
1513/F	1/1	297.0	0.0289	0.7389	0.3366	0.9026	5.1785	0.6739
1514/F	1/1	298.3	0.0308	0.6806	0.3470	0.7902	4.5219	0.4580
1515/F	1/1	279.8	0.0255	0.6956	0.3640	0.9454	5.1252	0.4821
1516/F	1/1	311.1	0.0299	0.6552	0.3481	0.7546	4.3956	0.4352
1517/F	1/1	286.4	0.0329	0.7410	0.3443	0.8840	5.0688	0.5499
1518/F	1/1	273.2	0.0307	0.7382	0.3428	0.8393	4.9156	0.4761
1519/F	1/1	269.9	0.0303	0.7680	0.3875	0.9675	6.0125	0.6704
1520/F	1/1	296.3	0.0318	0.7152	0.3605	0.8939	5.1981	0.4452
1521/F	1/1	318.7	0.0397	0.6316	0.3329	0.7591	4.7393	0.4387
1522/F	1/1	296.3	0.0254	0.6780	0.3591	0.7112	4.1461	0.4663
1523/F	1/1	256.7	0.0241	0.7985	0.3430	0.7551	4.5242	0.4685
1524/F	1/1	302.2	0.0322	0.7022	0.3864	0.9659	5.4005	0.4978
Mean:		290.5	0.0302	0.7119	0.3543	0.8474	4.9355	0.5052
Standard deviation:		17.9	0.0041	0.0478	0.0179	0.0912	0.5091	0.0838
Number of observ. :		(12)	(12)	(12)	(12)	(12)	(12)	(12)
2514/F	2/1	273.1	0.0205	0.7109	0.3022	0.7746	4.8518	0.4492
2515/F	2/1	310.7	0.0298	0.6260	0.3332	0.7328	5.0404	0.4740
2516/F	2/1	296.4	0.0375	0.7064	0.3533	0.7930	4.7118	0.5032
2517/F	2/1	297.2	0.0285	0.6933	0.4020	0.9473	5.3157	0.6231
2518/F	2/1	332.0	0.0295	0.6659	0.3531	0.8804	4.7091	0.6850
2519/F	2/1	268.4	0.0341	0.7989	0.4105	0.9531	5.5904	0.5383
2520/F	2/1	348.0	0.0217	0.5956	0.2932	0.6451	4.0947	0.4143
2521/F	2/1	308.6	0.0271	0.6955	0.3290	0.6992	4.6098	0.4734
2522/F	2/1	273.4	0.0290	0.7078	0.2952	0.8067	4.5151	0.4982
2523/F	2/1	267.6	0.0297	0.6968	0.3404	0.9043	4.7507	0.4964
2524/F	2/1	305.6	0.0349	0.6591	0.3503	0.7366	4.7119	0.5000
Mean:		298.3	0.0293	0.6869	0.3420	0.8066	4.8092	0.5141
Standard deviation:		26.5	0.0051	0.0524	0.0387	0.1027	0.3989	0.0775
Number of observ. :		(11)	(11)	(11)	(11)	(11)	(11)	(11)
3513/F	3/1	216.5	0.0436	0.9105	0.4152	0.9254	4.7020	0.7129
3514/F	3/1	244.5	0.0319	0.8651	0.3683	0.8308	4.9618	0.5737
3515/F	3/1	317.2	0.0352	0.6686	0.3089	0.7903	4.7282	0.4197
3516/F	3/1	296.4	0.0303	0.6779	0.3114	0.8251	4.7138	0.5369
3517/F	3/1	284.8	0.0310	0.7106	0.3637	0.8680	4.8913	0.5637
3518/F	3/1	270.2	0.0292	0.7241	0.3148	0.7726	3.9859	0.5325
3519/F	3/1	306.1	0.0270	0.7433	0.3492	0.8605	4.9259	0.5818
3520/F	3/1	276.5	0.0311	0.6662	0.3377	0.8236	4.3974	0.4635
3521/F	3/1	296.0	0.0327	0.7262	0.3310	0.7639	4.4503	0.5032
3522/F	3/1	272.6	0.0261	0.7059	0.3385	0.9544	4.4894	0.6060
3523/F	3/1	302.4	0.0261	0.7191	0.3740	0.8975	4.5505	0.7075
3524/F	3/1	332.7	0.0237	0.6676	0.3397	0.6766	4.1374	0.4649
Mean:		284.7	0.0307	0.7321	0.3460	0.8324	4.5778	0.5555
Standard deviation:		31.7	0.0052	0.0778	0.0306	0.0764	0.3053	0.0906

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Appendix EE - Satellite Study

Summary Statistics for % Organ to Body Weight
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Animal No/sex	Group/ Subgroup	Terminal Body wt. (g)	Adrenal Glands	Brain	Heart	Kidneys	Liver	Lungs
Number of observ. :		(12)	(12)	(12)	(12)	(12)	(12)	(12)
4513/F	4/1	325.7	0.0227	0.6771	0.3629	0.7932	5.3716	0.5585
4514/F	4/1	290.0	0.0334	0.6733	0.3273	0.7912	4.3134	0.4860
4515/F	4/1	272.8	0.0326	0.8585	0.3848	0.8655	5.1592	0.5679
4516/F	4/1	298.3	0.0275	0.7399	0.3554	0.9405	4.9767	0.5432
4517/F	4/1	274.4	0.0276	0.7603	0.4229	0.7394	3.7716	0.5360
4518/F	4/1	312.1	0.0262	0.6647	0.3260	0.8207	4.4284	0.4839
4519/F	4/1	238.5	0.0378	0.8499	0.3426	0.9095	4.1597	0.5995
4520/F	4/1	305.5	0.0211	0.6421	0.3548	0.7855	4.3832	0.4467
4521/F	4/1	302.9	0.0282	0.6780	0.3561	0.7862	4.8817	0.5097
4522/F	4/1	318.1	0.0320	0.6905	0.3496	0.8768	4.7946	0.5425
4523/F	4/1	287.3	0.0319	0.6878	0.4607	0.8128	5.2015	0.6761
4524/F	4/1	240.9	0.0349	0.7767	0.3252	0.8549	4.6763	0.6443
M e a n:		288.9	0.0297	0.7249	0.3640	0.8313	4.6765	0.5495
Standard deviation:		28.0	0.0050	0.0725	0.0410	0.0587	0.4771	0.0665
Number of observ. :		(12)	(12)	(12)	(12)	(12)	(12)	(12)

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Summary Statistics for % Organ to Body Weight
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Animal No/sex	Group/ Subgroup	Terminal Body wt. (g)	Ovary Left	Ovary Right	Spleen	Thymus	Uterus w/vagina
				Female Animals			
1513/F	1/1	297.0	0.0211	0.0284	0.2104	0.0966	0.3143
1514/F	1/1	298.3	0.0267	0.0251	0.2287	0.1155	0.2979
1515/F	1/1	279.8	0.0229	0.0226	0.2165	0.0728	0.3368
1516/F	1/1	311.1	0.0262	0.0270	0.2562	0.1406	0.3594
1517/F	1/1	286.4	0.0270	0.0265	0.2017	0.1115	0.2780
1518/F	1/1	273.2	0.0235	0.0215	0.2137	0.0848	0.3210
1519/F	1/1	269.9	0.0285	0.0310	0.2507	0.1126	0.4020
1520/F	1/1	296.3	0.0235	0.0291	0.2169	0.1467	0.4163
1521/F	1/1	318.7	0.0297	0.0258	0.1847	0.0942	0.2583
1522/F	1/1	296.3	0.0187	0.0221	0.2354	0.1117	0.3451
1523/F	1/1	256.7	0.0237	0.0257	0.2210	0.0451	0.3795
1524/F	1/1	302.2	0.0274	0.0284	0.2261	0.1013	0.4332
M e a n:		290.5	0.0249	0.0261	0.2218	0.1028	0.3452
Standard deviation:		17.9	0.0032	0.0029	0.0198	0.0277	0.0550
Number of observ. :		(12)	(12)	(12)	(12)	(12)	(12)
2514/F	2/1	273.1	0.0156	0.0133	0.1959	0.0838	0.3159
2515/F	2/1	310.7	0.0222	0.0204	0.2487	0.0838	0.2612
2516/F	2/1	296.4	0.0345	0.0315	0.2401	0.0836	0.3311
2517/F	2/1	297.2	0.0254	0.0285	0.2680	0.0981	0.3504
2518/F	2/1	332.0	0.0255	0.0237	0.2781	0.1038	0.3644
2519/F	2/1	268.4	0.0320	0.0330	0.2214	0.0825	0.4696
2520/F	2/1	348.0	0.0185	0.0234	0.1216	0.0711	0.3831
2521/F	2/1	308.6	0.0243	0.0190	0.2125	0.0951	0.2674
2522/F	2/1	273.4	0.0265	0.0219	0.2502	0.0887	0.3329
2523/F	2/1	267.6	0.0269	0.0251	0.2362	0.0920	0.2966
2524/F	2/1	305.6	0.0211	0.0229	0.2029	0.0868	0.2874
M e a n:		298.3	0.0248	0.0239	0.2251	0.0881	0.3327
Standard deviation:		26.5	0.0055	0.0056	0.0429	0.0089	0.0597
Number of observ. :		(11)	(11)	(11)	(11)	(11)	(11)
3513/F	3/1	216.5	0.0375	0.0382	0.2315	0.0950	0.4374
3514/F	3/1	244.5	0.0213	0.0259	0.2178	0.1039	0.3682
3515/F	3/1	317.2	0.0269	0.0208	0.2169	0.0619	0.2670
3516/F	3/1	296.4	0.0246	0.0142	0.2589	0.1060	0.3369
3517/F	3/1	284.8	0.0241	0.0243	0.2257	0.1094	0.3439
3518/F	3/1	270.2	0.0199	0.0245	0.2104	0.0577	0.3821
3519/F	3/1	306.1	0.0300	0.0243	0.2293	0.1503	0.3815
3520/F	3/1	276.5	0.0287	0.0188	0.1927	0.0763	0.2481
3521/F	3/1	296.0	0.0261	0.0214	0.2558	0.0780	0.3075
3522/F	3/1	272.6	0.0316	0.0287	0.2114	0.0475	0.3927
3523/F	3/1	302.4	0.0225	0.0259	0.2314	0.1120	0.3124
3524/F	3/1	332.7	0.0248	0.0249	0.2175	0.1050	0.3322
M e a n:		284.7	0.0265	0.0243	0.2249	0.0919	0.3425
Standard deviation:		31.7	0.0049	0.0058	0.0186	0.0288	0.0541

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Summary Statistics for % Organ to Body Weight
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Animal No/sex	Group/ Subgroup	Terminal Body wt. (g)	Ovary Left	Ovary Right	Spleen	Thymus	Uterus w/vagina
Number of observ. :		(12)	(12)	(12)	(12)	(12)	(12)
4513/F	4/1	325.7	0.0268	0.0215	0.2135	0.1064	0.3308
4514/F	4/1	290.0	0.0307	0.0230	0.2024	0.0802	0.3569
4515/F	4/1	272.8	0.0233	0.0305	0.2676	0.1060	0.4321
4516/F	4/1	298.3	0.0240	0.0222	0.1957	0.0643	0.3907
4517/F	4/1	274.4	0.0253	0.0255	0.2480	0.0977	0.3307
4518/F	4/1	312.1	0.0236	0.0194	0.2015	0.1201	0.2909
4519/F	4/1	238.5	0.0265	0.0326	0.1779	0.0621	0.3662
4520/F	4/1	305.5	0.0204	0.0216	0.2418	0.1077	0.3447
4521/F	4/1	302.9	0.0234	0.0280	0.2226	0.0961	0.3399
4522/F	4/1	318.1	0.0308	0.0263	0.1963	0.0982	0.3488
4523/F	4/1	287.3	0.0242	0.0289	0.2875	0.1491	0.4183
4524/F	4/1	240.9	0.0328	0.0366	0.2151	0.0438	0.3577
M e a n:		288.9	0.0260	0.0263	0.2225	0.0943	0.3590
Standard deviation:		28.0	0.0037	0.0052	0.0326	0.0284	0.0391
Number of observ. :		(12)	(12)	(12)	(12)	(12)	(12)

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Summary Statistics for % Organ to Body Weight
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Appendix EE - Satellite Study (non-pregnant animals)

Animal No/sex	Group/ Subgroup	Terminal Body wt. (g)	Adrenal Glands	Brain	Heart	Kidneys	Liver	Lungs
				Female Animals				
2513/F	2/1	257.8	0.0303	0.7771	0.3132	0.8491	3.8529	0.5516
Mean:		257.8	0.0303	0.7771	0.3132	0.8491	3.8529	0.5516
Standard deviation:		0.0	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Number of observ. :		(1)	(1)	(1)	(1)	(1)	(1)	(1)

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Summary Statistics for % Organ to Body Weight
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Appendix EE - Satellite Study (non-pregnant animals)

Animal No/sex	Group/ Subgroup	Terminal Body wt. (g)	Ovary Left	Ovary Right	Spleen	Thymus	Uterus w/vagina
				Female Animals			
2513/F	2/1	257.8	0.0199	0.0199	0.2531	0.1173	0.3130
Mean:		257.8	0.0199	0.0199	0.2531	0.1173	0.3130
Standard deviation:		0.0	0.0000	0.0000	0.0000	0.0000	0.0000
Number of observ. :		(1)	(1)	(1)	(1)	(1)	(1)

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Appendix EE - Satellite Study

Summary Statistics for % Organ to Brain Weight
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Animal No/sex	Group/ Subgroup	Terminal Body wt. (g)	Adrenal Glands	Heart	Kidneys	Liver	Lungs	Ovary Left
				F e m a l e A n i m a l s				
1513/F	1/1	297.0	3.9052	45.5502	122.1554	700.8522	91.2099	2.8526
1514/F	1/1	298.3	4.5264	50.9826	116.1060	664.3797	67.2906	3.9206
1515/F	1/1	279.8	3.6632	52.3325	135.9022	736.7551	69.3074	3.2881
1516/F	1/1	311.1	4.5579	53.1253	115.1752	670.9254	66.4214	3.9937
1517/F	1/1	286.4	4.4388	46.4706	119.2960	684.0496	74.2060	3.6472
1518/F	1/1	273.2	4.1603	46.4373	113.7056	665.9146	64.5014	3.1785
1519/F	1/1	269.9	3.9462	50.4511	125.9733	782.8501	87.2932	3.7098
1520/F	1/1	296.3	4.4406	50.4129	124.9823	726.8227	62.2434	3.2844
1521/F	1/1	318.7	6.2845	52.7001	120.1798	750.3701	69.4570	4.6997
1522/F	1/1	296.3	3.7483	52.9593	104.9032	611.5237	68.7740	2.7577
1523/F	1/1	256.7	3.0198	42.9554	94.5605	566.5773	58.6691	2.9661
1524/F	1/1	302.2	4.5806	55.0330	137.5495	769.0953	70.8907	3.9020
M e a n:		290.5	4.2726	49.9509	119.2074	694.1763	70.8553	3.5167
Standard deviation:		17.9	0.7871	3.7231	11.9550	63.9599	9.5338	0.5668
Number of observ. :		(12)	(12)	(12)	(12)	(12)	(12)	(12)
2514/F	2/1	273.1	2.8895	42.5032	108.9519	682.4827	63.1831	2.1993
2515/F	2/1	310.7	4.7612	53.2315	117.0600	805.2137	75.7211	3.5529
2516/F	2/1	296.4	5.3107	50.0072	112.2499	666.9708	71.2260	4.8904
2517/F	2/1	297.2	4.1155	57.9811	136.6416	766.7217	89.8811	3.6690
2518/F	2/1	332.0	4.4237	53.0261	132.2101	707.1785	102.8723	3.8221
2519/F	2/1	268.4	4.2718	51.3781	119.2977	699.7482	67.3740	4.0060
2520/F	2/1	348.0	3.6476	49.2329	108.3181	687.5278	69.5600	3.1120
2521/F	2/1	308.6	3.8951	47.3000	100.5358	662.8011	68.0660	3.4944
2522/F	2/1	273.4	4.1034	41.7106	113.9793	637.9536	70.3979	3.7416
2523/F	2/1	267.6	4.2690	48.8469	129.7812	681.8032	71.2378	3.8614
2524/F	2/1	305.6	5.2922	53.1450	111.7609	714.8687	75.8576	3.2021
M e a n:		298.3	4.2709	49.8511	117.3442	701.2064	75.0343	3.5956
Standard deviation:		26.5	0.6984	4.7851	11.2019	47.8501	11.5091	0.6591
Number of observ. :		(11)	(11)	(11)	(11)	(11)	(11)	(11)
3513/F	3/1	216.5	4.7938	45.5943	101.6284	516.4055	78.2986	4.1140
3514/F	3/1	244.5	3.6923	42.5681	96.0382	573.5439	66.3200	2.4584
3515/F	3/1	317.2	5.2572	46.1927	118.1998	707.1385	62.7752	4.0266
3516/F	3/1	296.4	4.4645	45.9437	121.7251	695.3912	79.2057	3.6233
3517/F	3/1	284.8	4.3629	51.1735	122.1454	688.2899	79.3221	3.3895
3518/F	3/1	270.2	4.0325	43.4785	106.7004	550.4448	73.5306	2.7497
3519/F	3/1	306.1	3.6350	46.9782	115.7795	662.7490	78.2823	4.0350
3520/F	3/1	276.5	4.6743	50.6949	123.6265	660.0869	69.5820	4.3051
3521/F	3/1	296.0	4.4987	45.5873	105.1873	612.8356	69.2998	3.5915
3522/F	3/1	272.6	3.6949	47.9551	135.2076	635.9820	85.8442	4.4744
3523/F	3/1	302.4	3.6235	52.0118	124.7942	632.7678	98.3860	3.1269
3524/F	3/1	332.7	3.5566	50.8779	101.3461	619.7146	69.6290	3.7142
M e a n:		284.7	4.1905	47.4213	114.3649	629.6125	75.8730	3.6340
Standard deviation:		31.7	0.5630	3.1304	11.9504	59.1330	9.6814	0.6173

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Summary Statistics for % Organ to Brain Weight
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Animal No/sex	Group/ Subgroup	Terminal Body wt. (g)	Adrenal Glands	Heart	Kidneys	Liver	Lungs	Ovary Left
Number of observ. :		(12)	(12)	(12)	(12)	(12)	(12)	(12)
4513/F	4/1	325.7	3.3465	53.5936	117.1541	793.3251	82.4831	3.9541
4514/F	4/1	290.0	4.9680	48.6146	117.5160	640.6608	72.1844	4.5634
4515/F	4/1	272.8	3.8003	44.8269	100.8198	600.9821	66.1471	2.7157
4516/F	4/1	298.3	3.7106	48.0292	127.1113	672.5942	73.4143	3.2394
4517/F	4/1	274.4	3.6235	55.6173	97.2393	496.0315	70.4946	3.3263
4518/F	4/1	312.1	3.9477	49.0408	123.4600	666.2056	72.7996	3.5573
4519/F	4/1	238.5	4.4452	40.3177	107.0206	489.4568	70.5363	3.1181
4520/F	4/1	305.5	3.2832	55.2536	122.3400	682.6715	69.5743	3.1710
4521/F	4/1	302.9	4.1630	52.5173	115.9461	719.9678	75.1729	3.4473
4522/F	4/1	318.1	4.6390	50.6283	126.9735	694.3276	78.5623	4.4569
4523/F	4/1	287.3	4.6407	66.9889	118.1782	756.2703	98.3047	3.5223
4524/F	4/1	240.9	4.4947	41.8631	110.0636	602.0577	82.9459	4.2221
M e a n:		288.9	4.0885	50.6076	115.3185	651.2126	76.0516	3.6078
Standard deviation:		28.0	0.5511	7.1123	9.7272	92.8281	8.6603	0.5727
Number of observ. :		(12)	(12)	(12)	(12)	(12)	(12)	(12)

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Summary Statistics for % Organ to Brain Weight
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Animal No/sex	Group/ Subgroup	Terminal Body wt. (g)	Ovary Right	Spleen	Thymus	Uterus w/vagina
				Female Animals		
1513/F	1/1	297.0	3.8414	28.4757	13.0690	42.5427
1514/F	1/1	298.3	3.6891	33.6010	16.9729	43.7620
1515/F	1/1	279.8	3.2470	31.1190	10.4603	48.4176
1516/F	1/1	311.1	4.1262	39.1031	21.4601	54.8621
1517/F	1/1	286.4	3.5812	27.2170	15.0504	37.5224
1518/F	1/1	273.2	2.9107	28.9532	11.4891	43.4869
1519/F	1/1	269.9	4.0378	32.6403	14.6558	52.3373
1520/F	1/1	296.3	4.0630	30.3336	20.5181	58.2134
1521/F	1/1	318.7	4.0886	29.2364	14.9138	40.8913
1522/F	1/1	296.3	3.2605	34.7155	16.4767	50.9035
1523/F	1/1	256.7	3.2198	27.6808	5.6493	47.5217
1524/F	1/1	302.2	4.0434	32.2055	14.4251	61.6965
Mean:		290.5	3.6757	31.2734	14.5951	48.5131
Standard deviation:		17.9	0.4238	3.4236	4.2730	7.3355
Number of observ. :		(12)	(12)	(12)	(12)	(12)
2514/F	2/1	273.1	1.8697	27.5560	11.7847	44.4347
2515/F	2/1	310.7	3.2649	39.7347	13.3837	41.7194
2516/F	2/1	296.4	4.4606	33.9892	11.8296	46.8743
2517/F	2/1	297.2	4.1155	38.6605	14.1519	50.5460
2518/F	2/1	332.0	3.5598	41.7632	15.5916	54.7223
2519/F	2/1	268.4	4.1272	27.7153	10.3297	58.7791
2520/F	2/1	348.0	3.9371	20.4140	11.9319	64.3202
2521/F	2/1	308.6	2.7256	30.5596	13.6700	38.4522
2522/F	2/1	273.4	3.0956	35.3488	12.5271	47.0388
2523/F	2/1	267.6	3.6040	33.9054	13.2093	42.5668
2524/F	2/1	305.6	3.4752	30.7849	13.1708	43.6082
Mean:		298.3	3.4759	32.7665	12.8709	48.4602
Standard deviation:		26.5	0.7329	6.2269	1.4097	7.9133
Number of observ. :		(11)	(11)	(11)	(11)	(11)
3513/F	3/1	216.5	4.2003	25.4249	10.4347	48.0394
3514/F	3/1	244.5	2.9974	25.1797	12.0083	42.5634
3515/F	3/1	317.2	3.1166	32.4343	9.2555	39.9265
3516/F	3/1	296.4	2.0904	38.1893	15.6381	49.7064
3517/F	3/1	284.8	3.4142	31.7555	15.3960	48.3967
3518/F	3/1	270.2	3.3834	29.0504	7.9628	52.7701
3519/F	3/1	306.1	3.2658	30.8514	20.2233	51.3296
3520/F	3/1	276.5	2.8284	28.9197	11.4604	37.2421
3521/F	3/1	296.0	2.9402	35.2315	10.7420	42.3401
3522/F	3/1	272.6	4.0690	29.9486	6.7297	55.6254
3523/F	3/1	302.4	3.5959	32.1792	15.5746	43.4405
3524/F	3/1	332.7	3.7367	32.5815	15.7212	49.7569
Mean:		284.7	3.3032	30.9788	12.5956	46.7614
Standard deviation:		31.7	0.5754	3.6967	3.9392	5.5843

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Summary Statistics for % Organ to Brain Weight
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Animal No/sex	Group/ Subgroup	Terminal Body wt. (g)	Ovary Right	Spleen	Thymus	Uterus w/vagina
Number of observ. :		(12)	(12)	(12)	(12)	(12)
4513/F	4/1	325.7	3.1696	31.5331	15.7212	48.8550
4514/F	4/1	290.0	3.4110	30.0589	11.9129	53.0090
4515/F	4/1	272.8	3.5484	31.1670	12.3489	50.3352
4516/F	4/1	298.3	3.0038	26.4498	8.6897	52.8045
4517/F	4/1	274.4	3.3599	32.6112	12.8451	43.4912
4518/F	4/1	312.1	2.9259	30.3143	18.0613	43.7675
4519/F	4/1	238.5	3.8384	20.9285	7.3117	43.0904
4520/F	4/1	305.5	3.3648	37.6651	16.7729	53.6936
4521/F	4/1	302.9	4.1338	32.8367	14.1689	50.1363
4522/F	4/1	318.1	3.8059	28.4303	14.2265	50.5144
4523/F	4/1	287.3	4.1953	41.8067	21.6751	60.8249
4524/F	4/1	240.9	4.7138	27.6896	5.6331	46.0585
M e a n:		288.9	3.6225	30.9576	13.2806	49.7150
Standard deviation:		28.0	0.5325	5.2960	4.5853	5.1607
Number of observ. :		(12)	(12)	(12)	(12)	(12)

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Appendix EE - Satellite Study

Summary Statistics for % Organ to Brain Weight
Study number: 034245

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Animal No/sex	Group/ Subgroup	Terminal Body wt. (g)	Adrenal Glands	Heart	Kidneys	Liver	Lungs	Ovary Left
				Female Animals				
2513/F	2/1	257.8	3.8986	40.3035	109.2697	495.8170	70.9829	2.5558
Mean:		257.8	3.8986	40.3035	109.2697	495.8170	70.9829	2.5558
Standard deviation:		0.0	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Number of observ. :		(1)	(1)	(1)	(1)	(1)	(1)	(1)

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Summary Statistics for % Organ to Brain Weight
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Animal No/sex	Group/ Subgroup	Terminal Body wt. (g)	Ovary Right	Spleen	Thymus	Uterus w/vagina
				Female Animals		
2513/F	2/1	257.8	2.5658	32.5763	15.0951	40.2835
Mean:		257.8	2.5658	32.5763	15.0951	40.2835
Standard deviation:		0.0	0.0000	0.0000	0.0000	0.0000
Number of observ. :		(1)	(1)	(1)	(1)	(1)

APPENDIX FF

PROPANE: COMBINED REPEATED-EXPOSURE TOXICITY, REPRODUCTION
AND NEUROTOXICITY SCREENING IN RATS VIA WHOLE-BODY
INHALATION EXPOSURES

INDIVIDUAL PUP CLINICAL OBSERVATIONS DURING LACTATION

GROUP 1 0 PPM

FEMALE#	OBSERVATIONS	DAY OF LACTATION 0	1	2	3	4
1513	PUP# 1 WITHIN NORMAL LIMITS	P				P
	PUP# 2 WITHIN NORMAL LIMITS	P				P
	PUP# 3 WITHIN NORMAL LIMITS	P				P
	PUP# 4 WITHIN NORMAL LIMITS	P				P
	PUP# 5 WITHIN NORMAL LIMITS	P				P
	PUP# 6 WITHIN NORMAL LIMITS	P				P
	PUP# 7 WITHIN NORMAL LIMITS	P				P
	PUP# 8 WITHIN NORMAL LIMITS	P				P
	PUP# 9 WITHIN NORMAL LIMITS	P				P
	PUP# 10 WITHIN NORMAL LIMITS	P				P
	PUP# 11 WITHIN NORMAL LIMITS	P				P
	PUP# 12 WITHIN NORMAL LIMITS	P				P
	PUP# 13 WITHIN NORMAL LIMITS	P				P
	PUP# 14 WITHIN NORMAL LIMITS	P				P
1514	PUP# 1 WITHIN NORMAL LIMITS	P				P
	PUP# 2 WITHIN NORMAL LIMITS	P				P
	PUP# 3 WITHIN NORMAL LIMITS	P				P
	PUP# 4 WITHIN NORMAL LIMITS	P				P
	PUP# 5 WITHIN NORMAL LIMITS	P				P
	PUP# 6 WITHIN NORMAL LIMITS	P				P
	PUP# 7 WITHIN NORMAL LIMITS	P				P
	PUP# 8 WITHIN NORMAL LIMITS	P				P
	PUP# 9 WITHIN NORMAL LIMITS	P				P
	PUP# 10 WITHIN NORMAL LIMITS	P				P
	PUP# 11 WITHIN NORMAL LIMITS	P				P
1515	PUP# 1 WITHIN NORMAL LIMITS	P				P
	PUP# 2 WITHIN NORMAL LIMITS	P				P
	PUP# 3 WITHIN NORMAL LIMITS	P				P
	PUP# 4 WITHIN NORMAL LIMITS	P				P
	PUP# 5 WITHIN NORMAL LIMITS	P				P

CODE: 1-SLIGHT 2-MODERATE 3-MARKED P-PRESENT

APPENDIX FF

PROPANE: COMBINED REPEATED-EXPOSURE TOXICITY, REPRODUCTION
AND NEUROTOXICITY SCREENING IN RATS VIA WHOLE-BODY
INHALATION EXPOSURES

INDIVIDUAL PUP CLINICAL OBSERVATIONS DURING LACTATION

GROUP 1 0 PPM

FEMALE#	OBSERVATIONS	DAY OF LACTATION 0	1	2	3	4
1515	PUP# 6 WITHIN NORMAL LIMITS	P				P
	PUP# 7 WITHIN NORMAL LIMITS	P				P
	PUP# 8 WITHIN NORMAL LIMITS	P				P
	PUP# 9 WITHIN NORMAL LIMITS	P				P
	PUP# 10 WITHIN NORMAL LIMITS	P				P
	PUP# 11 WITHIN NORMAL LIMITS	P				P
	PUP# 12 WITHIN NORMAL LIMITS	P				P
1516	PUP# 1 WITHIN NORMAL LIMITS	P				P
	PUP# 2 WITHIN NORMAL LIMITS	P				P
	PUP# 3 WITHIN NORMAL LIMITS	P				P
	PUP# 4 WITHIN NORMAL LIMITS	P				P
	PUP# 5 WITHIN NORMAL LIMITS	P				P
	PUP# 6 WITHIN NORMAL LIMITS	P				P
	PUP# 7 WITHIN NORMAL LIMITS	P				P
	PUP# 8 WITHIN NORMAL LIMITS	P				P
	PUP# 9 WITHIN NORMAL LIMITS	P				P
	PUP# 10 WITHIN NORMAL LIMITS	P				P
	PUP# 11 WITHIN NORMAL LIMITS	P				P
	PUP# 12 WITHIN NORMAL LIMITS	P				P
	PUP# 13 WITHIN NORMAL LIMITS	P				P
	PUP# 14 WITHIN NORMAL LIMITS	P				P
1517	PUP# 1 WITHIN NORMAL LIMITS	P				P
	PUP# 2 WITHIN NORMAL LIMITS	P				P
	PUP# 3 WITHIN NORMAL LIMITS	P				P
	PUP# 4 WITHIN NORMAL LIMITS	P				P
	PUP# 5 WITHIN NORMAL LIMITS	P				P
	PUP# 6 WITHIN NORMAL LIMITS	P				P
	PUP# 7 WITHIN NORMAL LIMITS	P				P
	PUP# 8 WITHIN NORMAL LIMITS	P				P
	PUP# 9 WITHIN NORMAL LIMITS	P				P

CODE: 1-SLIGHT 2-MODERATE 3-MARKED P-PRESENT

APPENDIX FF

PROPANE: COMBINED REPEATED-EXPOSURE TOXICITY, REPRODUCTION AND NEUROTOXICITY SCREENING IN RATS VIA WHOLE-BODY INHALATION EXPOSURES

INDIVIDUAL PUP CLINICAL OBSERVATIONS DURING LACTATION

GROUP 1 0 PPM

FEMALE#	OBSERVATIONS	DAY OF LACTATION 0	1	2	3	4
1517	PUP# 10 WITHIN NORMAL LIMITS	P				P
1518	PUP# 1 WITHIN NORMAL LIMITS	P				P
	PUP# 2 WITHIN NORMAL LIMITS	P				P
	PUP# 3 WITHIN NORMAL LIMITS	P				P
	PUP# 4 WITHIN NORMAL LIMITS	P				P
	PUP# 5 WITHIN NORMAL LIMITS	P				P
	PUP# 6 WITHIN NORMAL LIMITS	P				P
	PUP# 7 WITHIN NORMAL LIMITS	P				P
	PUP# 8 WITHIN NORMAL LIMITS	P				P
	PUP# 9 WITHIN NORMAL LIMITS	P				P
	PUP# 10 WITHIN NORMAL LIMITS	P				P
	PUP# 11 WITHIN NORMAL LIMITS	P				P
	PUP# 12 WITHIN NORMAL LIMITS	P				P
	PUP# 13 WITHIN NORMAL LIMITS	P				P
	PUP# 14 WITHIN NORMAL LIMITS	P				P
1519	PUP# 1 WITHIN NORMAL LIMITS	P				P
	PUP# 2 WITHIN NORMAL LIMITS	P				P
	PUP# 3 WITHIN NORMAL LIMITS	P				P
	PUP# 4 WITHIN NORMAL LIMITS	P				P
	PUP# 5 WITHIN NORMAL LIMITS	P				P
	PUP# 6 WITHIN NORMAL LIMITS	P				P
	PUP# 7 WITHIN NORMAL LIMITS	P				P
	PUP# 8 WITHIN NORMAL LIMITS	P				P
	PUP# 9 WITHIN NORMAL LIMITS	P				P
	PUP# 10 WITHIN NORMAL LIMITS	P				P
	PUP# 11 WITHIN NORMAL LIMITS	P				P
	PUP# 12 WITHIN NORMAL LIMITS	P				P
	PUP# 13 WITHIN NORMAL LIMITS	P				P
	PUP# 14 WITHIN NORMAL LIMITS	P				P
	PUP# 15 WITHIN NORMAL LIMITS	P				P

CODE: 1-SLIGHT 2-MODERATE 3-MARKED P-PRESENT

APPENDIX FF

PROPANE: COMBINED REPEATED-EXPOSURE TOXICITY, REPRODUCTION
AND NEUROTOXICITY SCREENING IN RATS VIA WHOLE-BODY
INHALATION EXPOSURES

INDIVIDUAL PUP CLINICAL OBSERVATIONS DURING LACTATION

GROUP 1 0 PPM

FEMALE#	OBSERVATIONS	DAY OF LACTATION 0	1	2	3	4
1519 PUP# 16	WITHIN NORMAL LIMITS	P				P
1520 PUP# 1	WITHIN NORMAL LIMITS	P				P
PUP# 2	WITHIN NORMAL LIMITS	P				P
PUP# 3	WITHIN NORMAL LIMITS	P				P
PUP# 4	WITHIN NORMAL LIMITS	P				P
PUP# 5	WITHIN NORMAL LIMITS	P				P
PUP# 6	WITHIN NORMAL LIMITS	P				
PUP# 7	WITHIN NORMAL LIMITS	P				P
PUP# 8	WITHIN NORMAL LIMITS	P				P
PUP# 9	WITHIN NORMAL LIMITS	P				P
PUP# 10	WITHIN NORMAL LIMITS	P				P
PUP# 11	WITHIN NORMAL LIMITS	P				P
PUP# 12	WITHIN NORMAL LIMITS	P				P
PUP# 13	WITHIN NORMAL LIMITS	P				P
PUP# 14	WITHIN NORMAL LIMITS	P				P
1521 PUP# 1	WITHIN NORMAL LIMITS	P				P
PUP# 2	WITHIN NORMAL LIMITS	P				P
PUP# 3	WITHIN NORMAL LIMITS	P				P
PUP# 4	WITHIN NORMAL LIMITS	P				P
PUP# 5	WITHIN NORMAL LIMITS	P				P
PUP# 6	WITHIN NORMAL LIMITS	P				P
PUP# 7	WITHIN NORMAL LIMITS	P				P
PUP# 8	WITHIN NORMAL LIMITS	P				P
PUP# 9	WITHIN NORMAL LIMITS	P				P
PUP# 10	WITHIN NORMAL LIMITS	P				P
PUP# 11	WITHIN NORMAL LIMITS	P				P
PUP# 12	WITHIN NORMAL LIMITS	P				P
PUP# 13	WITHIN NORMAL LIMITS	P				P
PUP# 14	WITHIN NORMAL LIMITS	P				P
PUP# 15	WITHIN NORMAL LIMITS	P				P

CODE: 1-SLIGHT 2-MODERATE 3-MARKED P-PRESENT

APPENDIX FF

PROPANE: COMBINED REPEATED-EXPOSURE TOXICITY, REPRODUCTION
AND NEUROTOXICITY SCREENING IN RATS VIA WHOLE-BODY
INHALATION EXPOSURES

INDIVIDUAL PUP CLINICAL OBSERVATIONS DURING LACTATION

GROUP 1 0 PPM

FEMALE#	OBSERVATIONS	DAY OF LACTATION	0	1	2	3	4
1521	PUP# 16 WITHIN NORMAL LIMITS		P				P
1522	PUP# 1 WITHIN NORMAL LIMITS		P				P
	PUP# 2 WITHIN NORMAL LIMITS		P				P
	PUP# 3 WITHIN NORMAL LIMITS		P				P
	PUP# 4 WITHIN NORMAL LIMITS		P				
	PUP# 5 WITHIN NORMAL LIMITS		P				P
	PUP# 6 WITHIN NORMAL LIMITS		P				P
	PUP# 7 WITHIN NORMAL LIMITS		P				P
	PUP# 8 WITHIN NORMAL LIMITS		P				P
	PUP# 9 WITHIN NORMAL LIMITS		P				P
	PUP# 10 WITHIN NORMAL LIMITS		P				P
	PUP# 11 WITHIN NORMAL LIMITS		P				P
	PUP# 12 WITHIN NORMAL LIMITS		P				P
	PUP# 13 WITHIN NORMAL LIMITS		P				P
	PUP# 14 WITHIN NORMAL LIMITS		P				P
1523	PUP# 2 WITHIN NORMAL LIMITS		P				P
	PUP# 3 WITHIN NORMAL LIMITS		P				P
	PUP# 4 WITHIN NORMAL LIMITS		P				P
	PUP# 5 WITHIN NORMAL LIMITS		P				P
	PUP# 6 WITHIN NORMAL LIMITS		P				P
	PUP# 7 WITHIN NORMAL LIMITS		P				P
	PUP# 8 WITHIN NORMAL LIMITS		P				P
	PUP# 9 WITHIN NORMAL LIMITS		P				P
	PUP# 10 WITHIN NORMAL LIMITS		P				P
	PUP# 11 WITHIN NORMAL LIMITS		P				P
	PUP# 12 WITHIN NORMAL LIMITS		P				P
	PUP# 1 WITHIN NORMAL LIMITS		P				P
	PUP# 13 MISSING TAIL		P				P

CODE: 1-SLIGHT 2-MODERATE 3-MARKED P-PRESENT

APPENDIX FF

PROPANE: COMBINED REPEATED-EXPOSURE TOXICITY, REPRODUCTION
AND NEUROTOXICITY SCREENING IN RATS VIA WHOLE-BODY
INHALATION EXPOSURES

INDIVIDUAL PUP CLINICAL OBSERVATIONS DURING LACTATION

GROUP 1 0 PPM

FEMALE#	OBSERVATIONS	DAY OF LACTATION	0	1	2	3	4
1524	PUP# 1	WITHIN NORMAL LIMITS	P				P
	PUP# 2	WITHIN NORMAL LIMITS	P				P
	PUP# 3	WITHIN NORMAL LIMITS	P				P
	PUP# 4	WITHIN NORMAL LIMITS	P				P
	PUP# 5	WITHIN NORMAL LIMITS	P				P
	PUP# 6	WITHIN NORMAL LIMITS	P				P
	PUP# 7	WITHIN NORMAL LIMITS	P				P
	PUP# 8	WITHIN NORMAL LIMITS	P				P
	PUP# 9	WITHIN NORMAL LIMITS	P				P
	PUP# 10	WITHIN NORMAL LIMITS	P				P
	PUP# 11	WITHIN NORMAL LIMITS	P				P
	PUP# 12	WITHIN NORMAL LIMITS	P				P
	PUP# 13	WITHIN NORMAL LIMITS	P				P
	PUP# 14	WITHIN NORMAL LIMITS	P				P
	PUP# 15	WITHIN NORMAL LIMITS	P				P
	PUP# 16	WITHIN NORMAL LIMITS	P				P
	PUP# 17	WITHIN NORMAL LIMITS	P				P

CODE: 1-SLIGHT 2-MODERATE 3-MARKED P-PRESENT

APPENDIX FF

PROPANE: COMBINED REPEATED-EXPOSURE TOXICITY, REPRODUCTION
AND NEUROTOXICITY SCREENING IN RATS VIA WHOLE-BODY
INHALATION EXPOSURES

INDIVIDUAL PUP CLINICAL OBSERVATIONS DURING LACTATION

GROUP 2 1200 PPM

FEMALE#	OBSERVATIONS	DAY OF LACTATION	0	1	2	3	4
2514	PUP# 1	WITHIN NORMAL LIMITS	P				P
	PUP# 2	WITHIN NORMAL LIMITS	P				P
	PUP# 3	WITHIN NORMAL LIMITS	P				P
	PUP# 4	WITHIN NORMAL LIMITS	P				P
	PUP# 5	WITHIN NORMAL LIMITS	P				P
	PUP# 6	WITHIN NORMAL LIMITS	P				P
	PUP# 7	WITHIN NORMAL LIMITS	P				P
	PUP# 8	WITHIN NORMAL LIMITS	P				P
	PUP# 9	WITHIN NORMAL LIMITS	P				P
	PUP# 10	WITHIN NORMAL LIMITS	P				P
	PUP# 11	WITHIN NORMAL LIMITS	P				P
	PUP# 12	WITHIN NORMAL LIMITS	P				P
	PUP# 13	WITHIN NORMAL LIMITS	P				P
2515	PUP# 1	WITHIN NORMAL LIMITS	P				P
	PUP# 2	WITHIN NORMAL LIMITS	P				P
	PUP# 3	WITHIN NORMAL LIMITS	P				P
	PUP# 4	WITHIN NORMAL LIMITS	P				P
	PUP# 5	WITHIN NORMAL LIMITS	P				P
	PUP# 6	WITHIN NORMAL LIMITS	P				P
	PUP# 7	WITHIN NORMAL LIMITS	P				P
	PUP# 8	WITHIN NORMAL LIMITS	P				P
	PUP# 9	WITHIN NORMAL LIMITS	P				P
	PUP# 10	WITHIN NORMAL LIMITS	P				P
	PUP# 11	WITHIN NORMAL LIMITS	P				P
	PUP# 12	WITHIN NORMAL LIMITS	P				P
	PUP# 13	WITHIN NORMAL LIMITS	P				P
	PUP# 14	WITHIN NORMAL LIMITS	P				P
	PUP# 15	WITHIN NORMAL LIMITS	P				P
	PUP# 16	WITHIN NORMAL LIMITS	P				P
	PUP# 17	WITHIN NORMAL LIMITS	P				P

CODE: 1-SLIGHT 2-MODERATE 3-MARKED P-PRESENT

APPENDIX FF

PROPANE: COMBINED REPEATED-EXPOSURE TOXICITY, REPRODUCTION
AND NEUROTOXICITY SCREENING IN RATS VIA WHOLE-BODY
INHALATION EXPOSURES

INDIVIDUAL PUP CLINICAL OBSERVATIONS DURING LACTATION

GROUP 2 1200 PPM

FEMALE#	OBSERVATIONS	DAY OF LACTATION	0	1	2	3	4
2516	PUP# 1	WITHIN NORMAL LIMITS	P				P
	PUP# 2	WITHIN NORMAL LIMITS	P				P
	PUP# 3	WITHIN NORMAL LIMITS	P				P
	PUP# 4	WITHIN NORMAL LIMITS	P				P
	PUP# 5	WITHIN NORMAL LIMITS	P				P
	PUP# 6	WITHIN NORMAL LIMITS	P				P
	PUP# 7	WITHIN NORMAL LIMITS	P				P
	PUP# 8	WITHIN NORMAL LIMITS	P				P
	PUP# 9	WITHIN NORMAL LIMITS	P				P
	PUP# 10	WITHIN NORMAL LIMITS	P				P
	PUP# 11	WITHIN NORMAL LIMITS	P				P
	PUP# 12	WITHIN NORMAL LIMITS	P				P
	PUP# 13	WITHIN NORMAL LIMITS	P				P
	PUP# 14	WITHIN NORMAL LIMITS	P				P
	PUP# 15	WITHIN NORMAL LIMITS	P				P
	PUP# 16	WITHIN NORMAL LIMITS	P				
2517	PUP# 1	WITHIN NORMAL LIMITS	P				P
	PUP# 2	WITHIN NORMAL LIMITS	P				P
	PUP# 3	WITHIN NORMAL LIMITS	P				P
	PUP# 4	WITHIN NORMAL LIMITS	P				P
	PUP# 5	WITHIN NORMAL LIMITS	P				P
	PUP# 6	WITHIN NORMAL LIMITS	P				P
	PUP# 7	WITHIN NORMAL LIMITS	P				P
	PUP# 8	WITHIN NORMAL LIMITS	P				P
	PUP# 9	WITHIN NORMAL LIMITS	P				P
	PUP# 10	WITHIN NORMAL LIMITS	P				P
	PUP# 11	WITHIN NORMAL LIMITS	P				P
	PUP# 12	WITHIN NORMAL LIMITS	P				P
	PUP# 13	WITHIN NORMAL LIMITS	P				P
	PUP# 14	WITHIN NORMAL LIMITS	P				P
	PUP# 15	WITHIN NORMAL LIMITS	P				P

CODE: 1-SLIGHT 2-MODERATE 3-MARKED P-PRESENT

APPENDIX FF

PROPANE: COMBINED REPEATED-EXPOSURE TOXICITY, REPRODUCTION
AND NEUROTOXICITY SCREENING IN RATS VIA WHOLE-BODY
INHALATION EXPOSURES

INDIVIDUAL PUP CLINICAL OBSERVATIONS DURING LACTATION

GROUP 2 1200 PPM

FEMALE#	OBSERVATIONS	DAY OF LACTATION	0	1	2	3	4
2517	PUP# 16 WITHIN NORMAL LIMITS		P				P
2518	PUP# 1 WITHIN NORMAL LIMITS		P				P
	PUP# 2 WITHIN NORMAL LIMITS		P				P
	PUP# 3 WITHIN NORMAL LIMITS		P				P
	PUP# 4 WITHIN NORMAL LIMITS		P				P
	PUP# 5 WITHIN NORMAL LIMITS		P				P
	PUP# 6 WITHIN NORMAL LIMITS		P				P
	PUP# 7 WITHIN NORMAL LIMITS		P				P
	PUP# 8 WITHIN NORMAL LIMITS		P				P
	PUP# 9 WITHIN NORMAL LIMITS		P				P
	PUP# 10 WITHIN NORMAL LIMITS		P				P
	PUP# 11 WITHIN NORMAL LIMITS		P				P
	PUP# 12 WITHIN NORMAL LIMITS		P				P
	PUP# 13 WITHIN NORMAL LIMITS		P				P
	PUP# 14 WITHIN NORMAL LIMITS		P				P
	PUP# 15 WITHIN NORMAL LIMITS		P				P
	PUP# 16 WITHIN NORMAL LIMITS		P				P
	PUP# 17 WITHIN NORMAL LIMITS		P				P
2519	PUP# 1 WITHIN NORMAL LIMITS		P				P
	PUP# 2 WITHIN NORMAL LIMITS		P				P
	PUP# 3 WITHIN NORMAL LIMITS		P				P
	PUP# 4 WITHIN NORMAL LIMITS		P				P
	PUP# 5 WITHIN NORMAL LIMITS		P				P
	PUP# 6 WITHIN NORMAL LIMITS		P				P
	PUP# 7 WITHIN NORMAL LIMITS		P				P
	PUP# 8 WITHIN NORMAL LIMITS		P				P
	PUP# 9 WITHIN NORMAL LIMITS		P				P
	PUP# 10 WITHIN NORMAL LIMITS		P				P
	PUP# 11 WITHIN NORMAL LIMITS		P				P
	PUP# 12 WITHIN NORMAL LIMITS		P				P

CODE: 1-SLIGHT 2-MODERATE 3-MARKED P-PRESENT

APPENDIX FF

PROPANE: COMBINED REPEATED-EXPOSURE TOXICITY, REPRODUCTION AND NEUROTOXICITY SCREENING IN RATS VIA WHOLE-BODY INHALATION EXPOSURES

INDIVIDUAL PUP CLINICAL OBSERVATIONS DURING LACTATION

GROUP 2 1200 PPM

FEMALE#	OBSERVATIONS	DAY OF LACTATION 0	1	2	3	4
2519	PUP# 13 WITHIN NORMAL LIMITS	P				P
	PUP# 14 WITHIN NORMAL LIMITS	P				P
	PUP# 15 WITHIN NORMAL LIMITS	P				P
	PUP# 16 WITHIN NORMAL LIMITS	P				P
2520	PUP# 1 WITHIN NORMAL LIMITS	P				P
	PUP# 2 WITHIN NORMAL LIMITS	P				P
	PUP# 3 WITHIN NORMAL LIMITS	P				P
	PUP# 4 WITHIN NORMAL LIMITS	P				P
	PUP# 5 WITHIN NORMAL LIMITS	P				P
	PUP# 6 WITHIN NORMAL LIMITS	P				P
	PUP# 7 WITHIN NORMAL LIMITS	P				P
	PUP# 8 WITHIN NORMAL LIMITS	P				P
	PUP# 9 WITHIN NORMAL LIMITS	P				P
	PUP# 10 WITHIN NORMAL LIMITS	P				P
	PUP# 11 WITHIN NORMAL LIMITS	P				P
	PUP# 12 WITHIN NORMAL LIMITS	P				P
	PUP# 13 WITHIN NORMAL LIMITS	P				P
	PUP# 14 WITHIN NORMAL LIMITS	P				P
2521	PUP# 1 WITHIN NORMAL LIMITS	P				P
	PUP# 2 WITHIN NORMAL LIMITS	P				P
	PUP# 3 WITHIN NORMAL LIMITS	P				P
	PUP# 4 WITHIN NORMAL LIMITS	P				P
	PUP# 5 WITHIN NORMAL LIMITS	P				P
	PUP# 6 WITHIN NORMAL LIMITS	P				P
	PUP# 7 WITHIN NORMAL LIMITS	P				P
	PUP# 8 WITHIN NORMAL LIMITS	P				P
	PUP# 9 WITHIN NORMAL LIMITS	P				P
	PUP# 10 WITHIN NORMAL LIMITS	P				P
	PUP# 11 WITHIN NORMAL LIMITS	P				P
	PUP# 12 WITHIN NORMAL LIMITS	P				P

CODE: 1-SLIGHT 2-MODERATE 3-MARKED P-PRESENT

APPENDIX FF

PROPANE: COMBINED REPEATED-EXPOSURE TOXICITY, REPRODUCTION
AND NEUROTOXICITY SCREENING IN RATS VIA WHOLE-BODY
INHALATION EXPOSURES

INDIVIDUAL PUP CLINICAL OBSERVATIONS DURING LACTATION

GROUP 2 1200 PPM

FEMALE#	OBSERVATIONS	DAY OF LACTATION	0	1	2	3	4
2521	PUP# 13	WITHIN NORMAL LIMITS	P				P
2522	PUP# 1	WITHIN NORMAL LIMITS	P				P
	PUP# 2	WITHIN NORMAL LIMITS	P				P
	PUP# 3	WITHIN NORMAL LIMITS	P				P
	PUP# 4	WITHIN NORMAL LIMITS	P				P
	PUP# 5	WITHIN NORMAL LIMITS	P				P
	PUP# 6	WITHIN NORMAL LIMITS	P				P
	PUP# 7	WITHIN NORMAL LIMITS	P				P
	PUP# 8	WITHIN NORMAL LIMITS	P				P
	PUP# 9	WITHIN NORMAL LIMITS	P				P
	PUP# 10	WITHIN NORMAL LIMITS	P				P
	PUP# 11	WITHIN NORMAL LIMITS	P				P
	PUP# 12	WITHIN NORMAL LIMITS	P				P
	PUP# 13	WITHIN NORMAL LIMITS	P				P
	PUP# 14	WITHIN NORMAL LIMITS	P				P
	PUP# 15	WITHIN NORMAL LIMITS	P				P
2523	PUP# 1	WITHIN NORMAL LIMITS	P				P
	PUP# 2	WITHIN NORMAL LIMITS	P				P
	PUP# 3	WITHIN NORMAL LIMITS	P				P
	PUP# 4	WITHIN NORMAL LIMITS	P				P
	PUP# 5	WITHIN NORMAL LIMITS	P				P
	PUP# 6	WITHIN NORMAL LIMITS	P				P
	PUP# 7	WITHIN NORMAL LIMITS	P				P
	PUP# 8	WITHIN NORMAL LIMITS	P				P
	PUP# 9	WITHIN NORMAL LIMITS	P				P
	PUP# 10	WITHIN NORMAL LIMITS	P				P
	PUP# 11	WITHIN NORMAL LIMITS	P				P
	PUP# 12	WITHIN NORMAL LIMITS	P				P
	PUP# 13	WITHIN NORMAL LIMITS	P				P

CODE: 1-SLIGHT 2-MODERATE 3-MARKED P-PRESENT

APPENDIX FF

PROPANE: COMBINED REPEATED-EXPOSURE TOXICITY, REPRODUCTION AND NEUROTOXICITY SCREENING IN RATS VIA WHOLE-BODY INHALATION EXPOSURES

INDIVIDUAL PUP CLINICAL OBSERVATIONS DURING LACTATION

GROUP 2 1200 PPM

FEMALE#	OBSERVATIONS	DAY OF LACTATION	0	1	2	3	4
2524	PUP# 1	WITHIN NORMAL LIMITS	P				P
	PUP# 2	WITHIN NORMAL LIMITS	P				P
	PUP# 3	WITHIN NORMAL LIMITS	P				P
	PUP# 4	WITHIN NORMAL LIMITS	P				P
	PUP# 5	WITHIN NORMAL LIMITS	P				P
	PUP# 6	WITHIN NORMAL LIMITS	P				P
	PUP# 7	WITHIN NORMAL LIMITS	P				P
	PUP# 8	WITHIN NORMAL LIMITS	P				P
	PUP# 9	WITHIN NORMAL LIMITS	P				P
	PUP# 10	WITHIN NORMAL LIMITS	P				P
	PUP# 11	WITHIN NORMAL LIMITS	P				P
	PUP# 12	WITHIN NORMAL LIMITS	P				P
	PUP# 13	WITHIN NORMAL LIMITS	P				P
	PUP# 14	WITHIN NORMAL LIMITS	P				P
	PUP# 15	WITHIN NORMAL LIMITS	P				P
	PUP# 16	WITHIN NORMAL LIMITS	P				P
	PUP# 17	WITHIN NORMAL LIMITS	P				P

CODE: 1-SLIGHT 2-MODERATE 3-MARKED P-PRESENT

APPENDIX FF

PROPANE: COMBINED REPEATED-EXPOSURE TOXICITY, REPRODUCTION
AND NEUROTOXICITY SCREENING IN RATS VIA WHOLE-BODY
INHALATION EXPOSURES

INDIVIDUAL PUP CLINICAL OBSERVATIONS DURING LACTATION

GROUP 3 4000 PPM

FEMALE#	OBSERVATIONS	DAY OF LACTATION 0	1	2	3	4
3513	PUP# 1 WITHIN NORMAL LIMITS	P				P
	PUP# 2 WITHIN NORMAL LIMITS	P				P
	PUP# 3 WITHIN NORMAL LIMITS	P				P
	PUP# 4 WITHIN NORMAL LIMITS	P				P
	PUP# 5 WITHIN NORMAL LIMITS	P				P
	PUP# 6 WITHIN NORMAL LIMITS	P				P
	PUP# 7 WITHIN NORMAL LIMITS	P				P
	PUP# 8 WITHIN NORMAL LIMITS	P				P
	PUP# 9 WITHIN NORMAL LIMITS	P				P
	PUP# 10 WITHIN NORMAL LIMITS	P				P
	PUP# 11 WITHIN NORMAL LIMITS	P				P
	PUP# 12 WITHIN NORMAL LIMITS	P				P
3514	PUP# 1 WITHIN NORMAL LIMITS	P				P
	PUP# 2 WITHIN NORMAL LIMITS	P				P
	PUP# 3 WITHIN NORMAL LIMITS	P				P
	PUP# 4 WITHIN NORMAL LIMITS	P				P
	PUP# 5 WITHIN NORMAL LIMITS	P				P
	PUP# 6 WITHIN NORMAL LIMITS	P				P
	PUP# 7 WITHIN NORMAL LIMITS	P				P
	PUP# 8 WITHIN NORMAL LIMITS	P				P
	PUP# 9 WITHIN NORMAL LIMITS	P				
	PUP# 10 WITHIN NORMAL LIMITS	P				P
	PUP# 11 WITHIN NORMAL LIMITS	P				P
3515	PUP# 1 WITHIN NORMAL LIMITS	P				P
	PUP# 2 WITHIN NORMAL LIMITS	P				P
	PUP# 3 WITHIN NORMAL LIMITS	P				P
	PUP# 4 WITHIN NORMAL LIMITS	P				P
	PUP# 5 WITHIN NORMAL LIMITS	P				P
	PUP# 6 WITHIN NORMAL LIMITS	P				P
	PUP# 7 WITHIN NORMAL LIMITS	P				P

CODE: 1-SLIGHT 2-MODERATE 3-MARKED P-PRESENT

APPENDIX FF

PROPANE: COMBINED REPEATED-EXPOSURE TOXICITY, REPRODUCTION
AND NEUROTOXICITY SCREENING IN RATS VIA WHOLE-BODY
INHALATION EXPOSURES

INDIVIDUAL PUP CLINICAL OBSERVATIONS DURING LACTATION

GROUP 3 4000 PPM

FEMALE#	OBSERVATIONS	DAY OF LACTATION 0	1	2	3	4
3515	PUP# 8 WITHIN NORMAL LIMITS	P				P
	PUP# 9 WITHIN NORMAL LIMITS	P				P
	PUP# 11 WITHIN NORMAL LIMITS	P				P
	PUP# 12 WITHIN NORMAL LIMITS	P				P
	PUP# 13 WITHIN NORMAL LIMITS	P				P
	PUP# 14 WITHIN NORMAL LIMITS	P				P
	PUP# 15 WITHIN NORMAL LIMITS	P				P
	PUP# 16 WITHIN NORMAL LIMITS	P				P
	PUP# 10 BLACK SUBCUTANEOUS DISCOLORATION	P				
3516	PUP# 1 WITHIN NORMAL LIMITS	P				P
	PUP# 2 WITHIN NORMAL LIMITS	P				P
	PUP# 3 WITHIN NORMAL LIMITS	P				P
	PUP# 4 WITHIN NORMAL LIMITS	P				P
	PUP# 5 WITHIN NORMAL LIMITS	P				P
	PUP# 6 WITHIN NORMAL LIMITS	P				P
	PUP# 7 WITHIN NORMAL LIMITS	P				P
	PUP# 8 WITHIN NORMAL LIMITS	P				P
	PUP# 9 WITHIN NORMAL LIMITS	P				P
	PUP# 10 WITHIN NORMAL LIMITS	P				P
	PUP# 11 WITHIN NORMAL LIMITS	P				P
	PUP# 12 WITHIN NORMAL LIMITS	P				P
	PUP# 13 WITHIN NORMAL LIMITS	P				P
	PUP# 14 WITHIN NORMAL LIMITS	P				P
3517	PUP# 1 WITHIN NORMAL LIMITS	P				P
	PUP# 2 WITHIN NORMAL LIMITS	P				P
	PUP# 3 WITHIN NORMAL LIMITS	P				P
	PUP# 4 WITHIN NORMAL LIMITS	P				P
	PUP# 5 WITHIN NORMAL LIMITS	P				P
	PUP# 6 WITHIN NORMAL LIMITS	P				P
	PUP# 7 WITHIN NORMAL LIMITS	P				P

CODE: 1-SLIGHT 2-MODERATE 3-MARKED P-PRESENT

APPENDIX FF

PROPANE: COMBINED REPEATED-EXPOSURE TOXICITY, REPRODUCTION
AND NEUROTOXICITY SCREENING IN RATS VIA WHOLE-BODY
INHALATION EXPOSURES

INDIVIDUAL PUP CLINICAL OBSERVATIONS DURING LACTATION

GROUP 3 4000 PPM

FEMALE#	OBSERVATIONS	DAY OF LACTATION 0	1	2	3	4
3517	PUP# 8 WITHIN NORMAL LIMITS	P				P
	PUP# 9 WITHIN NORMAL LIMITS	P				P
	PUP# 10 WITHIN NORMAL LIMITS	P				P
	PUP# 11 WITHIN NORMAL LIMITS	P				P
	PUP# 12 WITHIN NORMAL LIMITS	P				P
	PUP# 13 WITHIN NORMAL LIMITS	P				P
3518	PUP# 1 WITHIN NORMAL LIMITS	P				P
	PUP# 2 WITHIN NORMAL LIMITS	P				P
	PUP# 3 WITHIN NORMAL LIMITS	P				P
	PUP# 4 WITHIN NORMAL LIMITS	P				P
	PUP# 5 WITHIN NORMAL LIMITS	P				P
	PUP# 6 WITHIN NORMAL LIMITS	P				P
	PUP# 7 WITHIN NORMAL LIMITS	P				P
	PUP# 8 WITHIN NORMAL LIMITS	P				P
	PUP# 9 WITHIN NORMAL LIMITS	P				P
	PUP# 10 WITHIN NORMAL LIMITS	P				P
	PUP# 11 WITHIN NORMAL LIMITS	P				P
	PUP# 12 WITHIN NORMAL LIMITS	P				P
	PUP# 13 WITHIN NORMAL LIMITS	P				P
	PUP# 14 WITHIN NORMAL LIMITS	P				P
	PUP# 15 WITHIN NORMAL LIMITS	P				P
3519	PUP# 1 WITHIN NORMAL LIMITS	P				P
	PUP# 2 WITHIN NORMAL LIMITS	P				P
	PUP# 3 WITHIN NORMAL LIMITS	P				P
	PUP# 4 WITHIN NORMAL LIMITS	P				P
	PUP# 5 WITHIN NORMAL LIMITS	P				P
	PUP# 6 WITHIN NORMAL LIMITS	P				P
	PUP# 7 WITHIN NORMAL LIMITS	P				P
	PUP# 8 WITHIN NORMAL LIMITS	P				P
	PUP# 9 WITHIN NORMAL LIMITS	P				P

CODE: 1-SLIGHT 2-MODERATE 3-MARKED P-PRESENT

APPENDIX FF

PROPANE: COMBINED REPEATED-EXPOSURE TOXICITY, REPRODUCTION AND NEUROTOXICITY SCREENING IN RATS VIA WHOLE-BODY INHALATION EXPOSURES

INDIVIDUAL PUP CLINICAL OBSERVATIONS DURING LACTATION

GROUP 3 4000 PPM

FEMALE#	OBSERVATIONS	DAY OF LACTATION	0	1	2	3	4
3519	PUP# 10	WITHIN NORMAL LIMITS	P				P
3520	PUP# 1	WITHIN NORMAL LIMITS	P				P
	PUP# 2	WITHIN NORMAL LIMITS	P				P
	PUP# 3	WITHIN NORMAL LIMITS	P				P
	PUP# 4	WITHIN NORMAL LIMITS	P				P
	PUP# 5	WITHIN NORMAL LIMITS	P				P
	PUP# 6	WITHIN NORMAL LIMITS	P				P
	PUP# 7	WITHIN NORMAL LIMITS	P				P
	PUP# 8	WITHIN NORMAL LIMITS	P				P
	PUP# 9	WITHIN NORMAL LIMITS	P				P
	PUP# 10	WITHIN NORMAL LIMITS	P				P
	PUP# 11	WITHIN NORMAL LIMITS	P				P
	PUP# 12	WITHIN NORMAL LIMITS	P				P
	PUP# 13	WITHIN NORMAL LIMITS	P				P
	PUP# 14	WITHIN NORMAL LIMITS	P				P
	PUP# 15	WITHIN NORMAL LIMITS	P				P
3521	PUP# 1	WITHIN NORMAL LIMITS	P				P
	PUP# 2	WITHIN NORMAL LIMITS	P				P
	PUP# 3	WITHIN NORMAL LIMITS	P				P
	PUP# 4	WITHIN NORMAL LIMITS	P				
	PUP# 5	WITHIN NORMAL LIMITS	P				P
	PUP# 6	WITHIN NORMAL LIMITS	P				P
	PUP# 7	WITHIN NORMAL LIMITS	P				P
	PUP# 8	WITHIN NORMAL LIMITS	P				P
	PUP# 9	WITHIN NORMAL LIMITS	P				P
	PUP# 10	WITHIN NORMAL LIMITS	P				P
	PUP# 11	WITHIN NORMAL LIMITS	P				P
	PUP# 12	WITHIN NORMAL LIMITS	P				P
	PUP# 13	WITHIN NORMAL LIMITS	P				P
	PUP# 14	WITHIN NORMAL LIMITS	P				P

CODE: 1-SLIGHT 2-MODERATE 3-MARKED P-PRESENT

APPENDIX FF

PROPANE: COMBINED REPEATED-EXPOSURE TOXICITY, REPRODUCTION
AND NEUROTOXICITY SCREENING IN RATS VIA WHOLE-BODY
INHALATION EXPOSURES

INDIVIDUAL PUP CLINICAL OBSERVATIONS DURING LACTATION

GROUP 3 4000 PPM

FEMALE#	OBSERVATIONS	DAY OF LACTATION	0	1	2	3	4
3523	PUP# 1	WITHIN NORMAL LIMITS	P				P
	PUP# 2	WITHIN NORMAL LIMITS	P				P
	PUP# 3	WITHIN NORMAL LIMITS	P				P
	PUP# 4	WITHIN NORMAL LIMITS	P				P
	PUP# 5	WITHIN NORMAL LIMITS	P				P
	PUP# 6	WITHIN NORMAL LIMITS	P				P
	PUP# 7	WITHIN NORMAL LIMITS	P				P
3524	PUP# 1	WITHIN NORMAL LIMITS	P				P
	PUP# 2	WITHIN NORMAL LIMITS	P				P
	PUP# 3	WITHIN NORMAL LIMITS	P				P
	PUP# 4	WITHIN NORMAL LIMITS	P				P
	PUP# 5	WITHIN NORMAL LIMITS	P				P
	PUP# 6	WITHIN NORMAL LIMITS	P				P
	PUP# 7	WITHIN NORMAL LIMITS	P				P
	PUP# 8	WITHIN NORMAL LIMITS	P				P
	PUP# 9	WITHIN NORMAL LIMITS	P				P
	PUP# 10	WITHIN NORMAL LIMITS	P				P
	PUP# 11	WITHIN NORMAL LIMITS	P				P
	PUP# 12	WITHIN NORMAL LIMITS	P				P
	PUP# 13	WITHIN NORMAL LIMITS	P				P
	PUP# 14	WITHIN NORMAL LIMITS	P				
	PUP# 15	WITHIN NORMAL LIMITS	P				P
	PUP# 16	WITHIN NORMAL LIMITS	P				P
	PUP# 17	WITHIN NORMAL LIMITS	P				P

CODE: 1-SLIGHT 2-MODERATE 3-MARKED P-PRESENT

APPENDIX FF

PROPANE: COMBINED REPEATED-EXPOSURE TOXICITY, REPRODUCTION
AND NEUROTOXICITY SCREENING IN RATS VIA WHOLE-BODY
INHALATION EXPOSURES

INDIVIDUAL PUP CLINICAL OBSERVATIONS DURING LACTATION

GROUP 4 12000 PPM

FEMALE#	OBSERVATIONS	DAY OF LACTATION 0	1	2	3	4
4513	PUP# 1 WITHIN NORMAL LIMITS	P				P
	PUP# 2 WITHIN NORMAL LIMITS	P				P
	PUP# 3 WITHIN NORMAL LIMITS	P				P
	PUP# 4 WITHIN NORMAL LIMITS	P				P
	PUP# 5 WITHIN NORMAL LIMITS	P				P
	PUP# 6 WITHIN NORMAL LIMITS	P				P
	PUP# 7 WITHIN NORMAL LIMITS	P				P
	PUP# 8 WITHIN NORMAL LIMITS	P				P
	PUP# 9 WITHIN NORMAL LIMITS	P				P
	PUP# 10 WITHIN NORMAL LIMITS	P				P
	PUP# 11 WITHIN NORMAL LIMITS	P				P
	PUP# 12 WITHIN NORMAL LIMITS	P				P
	PUP# 13 WITHIN NORMAL LIMITS	P				P
	PUP# 14 WITHIN NORMAL LIMITS	P				P
	PUP# 15 WITHIN NORMAL LIMITS	P				P
4514	PUP# 1 WITHIN NORMAL LIMITS	P				P
	PUP# 2 WITHIN NORMAL LIMITS	P				P
	PUP# 3 WITHIN NORMAL LIMITS	P				P
	PUP# 4 WITHIN NORMAL LIMITS	P				P
	PUP# 5 WITHIN NORMAL LIMITS	P				P
	PUP# 6 WITHIN NORMAL LIMITS	P				P
	PUP# 7 WITHIN NORMAL LIMITS	P				P
	PUP# 8 WITHIN NORMAL LIMITS	P				P
	PUP# 9 WITHIN NORMAL LIMITS	P				P
	PUP# 10 WITHIN NORMAL LIMITS	P				P
	PUP# 11 WITHIN NORMAL LIMITS	P				P
	PUP# 12 WITHIN NORMAL LIMITS	P				P
	PUP# 13 WITHIN NORMAL LIMITS	P				P
	PUP# 14 WITHIN NORMAL LIMITS	P				P

CODE: 1-SLIGHT 2-MODERATE 3-MARKED P-PRESENT

APPENDIX FF

PROPANE: COMBINED REPEATED-EXPOSURE TOXICITY, REPRODUCTION AND NEUROTOXICITY SCREENING IN RATS VIA WHOLE-BODY INHALATION EXPOSURES

INDIVIDUAL PUP CLINICAL OBSERVATIONS DURING LACTATION

GROUP 4 12000 PPM

FEMALE#	OBSERVATIONS	DAY OF LACTATION	0	1	2	3	4
4515	PUP# 1	WITHIN NORMAL LIMITS	P				P
	PUP# 2	WITHIN NORMAL LIMITS	P				P
	PUP# 3	WITHIN NORMAL LIMITS	P				P
	PUP# 4	WITHIN NORMAL LIMITS	P				P
	PUP# 5	WITHIN NORMAL LIMITS	P				P
	PUP# 6	WITHIN NORMAL LIMITS	P				P
	PUP# 7	WITHIN NORMAL LIMITS	P				P
	PUP# 8	WITHIN NORMAL LIMITS	P				P
	PUP# 9	WITHIN NORMAL LIMITS	P				P
	PUP# 10	WITHIN NORMAL LIMITS	P				P
	PUP# 11	WITHIN NORMAL LIMITS	P				P
	PUP# 12	WITHIN NORMAL LIMITS	P				P
	PUP# 13	WITHIN NORMAL LIMITS	P				P
4516	PUP# 1	WITHIN NORMAL LIMITS	P				P
	PUP# 2	WITHIN NORMAL LIMITS	P				P
	PUP# 3	WITHIN NORMAL LIMITS	P				P
	PUP# 4	WITHIN NORMAL LIMITS	P				P
	PUP# 5	WITHIN NORMAL LIMITS	P				P
	PUP# 6	WITHIN NORMAL LIMITS	P				P
	PUP# 7	WITHIN NORMAL LIMITS	P				P
	PUP# 8	WITHIN NORMAL LIMITS	P				P
	PUP# 9	WITHIN NORMAL LIMITS	P				P
	PUP# 10	WITHIN NORMAL LIMITS	P				P
	PUP# 11	WITHIN NORMAL LIMITS	P				P
	PUP# 12	WITHIN NORMAL LIMITS	P				P
	PUP# 13	WITHIN NORMAL LIMITS	P				P
	PUP# 14	WITHIN NORMAL LIMITS	P				P

CODE: 1-SLIGHT 2-MODERATE 3-MARKED P-PRESENT

APPENDIX FF

PROPANE: COMBINED REPEATED-EXPOSURE TOXICITY, REPRODUCTION
AND NEUROTOXICITY SCREENING IN RATS VIA WHOLE-BODY
INHALATION EXPOSURES

INDIVIDUAL PUP CLINICAL OBSERVATIONS DURING LACTATION

GROUP 4 12000 PPM

FEMALE#	OBSERVATIONS	DAY OF LACTATION 0	1	2	3	4
4517	PUP# 3 WITHIN NORMAL LIMITS	P				P
	PUP# 4 WITHIN NORMAL LIMITS	P				P
	PUP# 5 WITHIN NORMAL LIMITS	P				P
	PUP# 6 WITHIN NORMAL LIMITS	P				P
	PUP# 7 WITHIN NORMAL LIMITS	P				P
	PUP# 8 WITHIN NORMAL LIMITS	P				P
	PUP# 9 WITHIN NORMAL LIMITS	P				P
	PUP# 10 WITHIN NORMAL LIMITS	P				P
	PUP# 11 WITHIN NORMAL LIMITS	P				P
	PUP# 12 WITHIN NORMAL LIMITS	P				P
	PUP# 13 WITHIN NORMAL LIMITS	P				P
	PUP# 14 WITHIN NORMAL LIMITS	P				P
	PUP# 15 WITHIN NORMAL LIMITS	P				P
	PUP# 16 WITHIN NORMAL LIMITS	P				P
	PUP# 17 WITHIN NORMAL LIMITS	P				P
	PUP# 18 WITHIN NORMAL LIMITS	P				P
4518	PUP# 1 WITHIN NORMAL LIMITS	P				P
	PUP# 2 WITHIN NORMAL LIMITS	P				P
	PUP# 3 WITHIN NORMAL LIMITS	P				P
	PUP# 4 WITHIN NORMAL LIMITS	P				P
	PUP# 5 WITHIN NORMAL LIMITS	P				P
	PUP# 6 WITHIN NORMAL LIMITS	P				P
	PUP# 7 WITHIN NORMAL LIMITS	P				P
	PUP# 8 WITHIN NORMAL LIMITS	P				P
	PUP# 9 WITHIN NORMAL LIMITS	P				P
	PUP# 10 WITHIN NORMAL LIMITS	P				P
	PUP# 11 WITHIN NORMAL LIMITS	P				P
	PUP# 12 WITHIN NORMAL LIMITS	P				P
	PUP# 13 WITHIN NORMAL LIMITS	P				P
	PUP# 14 WITHIN NORMAL LIMITS	P				P

CODE: 1-SLIGHT 2-MODERATE 3-MARKED P-PRESENT

APPENDIX FF

PROPANE: COMBINED REPEATED-EXPOSURE TOXICITY, REPRODUCTION
AND NEUROTOXICITY SCREENING IN RATS VIA WHOLE-BODY
INHALATION EXPOSURES

INDIVIDUAL PUP CLINICAL OBSERVATIONS DURING LACTATION

GROUP 4 12000 PPM

FEMALE#	OBSERVATIONS	DAY OF LACTATION 0	1	2	3	4
4519	PUP# 1 WITHIN NORMAL LIMITS	P				P
	PUP# 2 WITHIN NORMAL LIMITS	P				P
	PUP# 3 WITHIN NORMAL LIMITS	P				P
	PUP# 4 WITHIN NORMAL LIMITS	P				P
	PUP# 5 WITHIN NORMAL LIMITS	P				P
	PUP# 6 WITHIN NORMAL LIMITS	P				P
	PUP# 7 WITHIN NORMAL LIMITS	P				P
	PUP# 8 WITHIN NORMAL LIMITS	P				P
	PUP# 9 WITHIN NORMAL LIMITS	P				P
	PUP# 10 WITHIN NORMAL LIMITS	P				P
	PUP# 11 WITHIN NORMAL LIMITS	P				P
	PUP# 12 WITHIN NORMAL LIMITS	P				P
	PUP# 13 WITHIN NORMAL LIMITS	P				P
	PUP# 14 WITHIN NORMAL LIMITS	P				P
	PUP# 15 WITHIN NORMAL LIMITS	P				P
4520	PUP# 4 WITHIN NORMAL LIMITS	P				P
	PUP# 5 WITHIN NORMAL LIMITS	P				P
	PUP# 6 WITHIN NORMAL LIMITS	P				P
	PUP# 7 WITHIN NORMAL LIMITS	P				P
	PUP# 8 WITHIN NORMAL LIMITS	P				P
	PUP# 9 WITHIN NORMAL LIMITS	P				P
	PUP# 10 WITHIN NORMAL LIMITS	P				P
	PUP# 11 WITHIN NORMAL LIMITS	P				P
	PUP# 12 WITHIN NORMAL LIMITS	P				P
	PUP# 13 WITHIN NORMAL LIMITS	P				P
	PUP# 14 WITHIN NORMAL LIMITS	P				P
	PUP# 15 WITHIN NORMAL LIMITS	P				P
	PUP# 16 WITHIN NORMAL LIMITS	P				P

CODE: 1-SLIGHT 2-MODERATE 3-MARKED P-PRESENT

APPENDIX FF

PROPANE: COMBINED REPEATED-EXPOSURE TOXICITY, REPRODUCTION
AND NEUROTOXICITY SCREENING IN RATS VIA WHOLE-BODY
INHALATION EXPOSURES

INDIVIDUAL PUP CLINICAL OBSERVATIONS DURING LACTATION

GROUP 4 12000 PPM

FEMALE#	OBSERVATIONS	DAY OF LACTATION	0	1	2	3	4
4521	PUP# 1	WITHIN NORMAL LIMITS	P				P
	PUP# 2	WITHIN NORMAL LIMITS	P				P
	PUP# 3	WITHIN NORMAL LIMITS	P				P
	PUP# 4	WITHIN NORMAL LIMITS	P				P
	PUP# 5	WITHIN NORMAL LIMITS	P				P
	PUP# 6	WITHIN NORMAL LIMITS	P				P
	PUP# 7	WITHIN NORMAL LIMITS	P				P
	PUP# 8	WITHIN NORMAL LIMITS	P				P
	PUP# 9	WITHIN NORMAL LIMITS	P				P
	PUP# 10	WITHIN NORMAL LIMITS	P				P
	PUP# 11	WITHIN NORMAL LIMITS	P				P
	PUP# 12	WITHIN NORMAL LIMITS	P				P
	PUP# 13	WITHIN NORMAL LIMITS	P				P
	PUP# 14	WITHIN NORMAL LIMITS	P				P
	PUP# 15	WITHIN NORMAL LIMITS	P				P
	PUP# 16	WITHIN NORMAL LIMITS	P				P
	PUP# 17	WITHIN NORMAL LIMITS	P				P
4522	PUP# 1	WITHIN NORMAL LIMITS	P				P
	PUP# 2	WITHIN NORMAL LIMITS	P				
	PUP# 3	WITHIN NORMAL LIMITS	P				P
	PUP# 4	WITHIN NORMAL LIMITS	P				P
	PUP# 5	WITHIN NORMAL LIMITS	P				P
	PUP# 6	WITHIN NORMAL LIMITS	P				P
	PUP# 7	WITHIN NORMAL LIMITS	P				P
	PUP# 8	WITHIN NORMAL LIMITS	P				P
	PUP# 9	WITHIN NORMAL LIMITS	P				P
	PUP# 10	WITHIN NORMAL LIMITS	P				P
	PUP# 11	WITHIN NORMAL LIMITS	P				P
	PUP# 12	WITHIN NORMAL LIMITS	P				P
	PUP# 13	WITHIN NORMAL LIMITS	P				P
	PUP# 14	WITHIN NORMAL LIMITS	P				P

CODE: 1-SLIGHT 2-MODERATE 3-MARKED P-PRESENT

APPENDIX FF

PROPANE: COMBINED REPEATED-EXPOSURE TOXICITY, REPRODUCTION
AND NEUROTOXICITY SCREENING IN RATS VIA WHOLE-BODY
INHALATION EXPOSURES

INDIVIDUAL PUP CLINICAL OBSERVATIONS DURING LACTATION

GROUP 4 12000 PPM

FEMALE#	OBSERVATIONS	DAY OF LACTATION	0	1	2	3	4
4522	PUP# 15 WITHIN NORMAL LIMITS		P				P
4523	PUP# 1 WITHIN NORMAL LIMITS		P				P
	PUP# 2 WITHIN NORMAL LIMITS		P				P
	PUP# 3 WITHIN NORMAL LIMITS		P				P
	PUP# 4 WITHIN NORMAL LIMITS		P				P
	PUP# 5 WITHIN NORMAL LIMITS		P				P
	PUP# 6 WITHIN NORMAL LIMITS		P				P
	PUP# 7 WITHIN NORMAL LIMITS		P				P
	PUP# 8 WITHIN NORMAL LIMITS		P				P
	PUP# 9 WITHIN NORMAL LIMITS		P				P
	PUP# 10 WITHIN NORMAL LIMITS		P				P
	PUP# 11 WITHIN NORMAL LIMITS		P				P
	PUP# 12 WITHIN NORMAL LIMITS		P				P
	PUP# 13 WITHIN NORMAL LIMITS		P				P

CODE: 1-SLIGHT 2-MODERATE 3-MARKED P-PRESENT

APPENDIX GG

PROPANE: COMBINED REPEATED-EXPOSURE TOXICITY, REPRODUCTION AND NEUROTOXICITY SCREENING IN RATS VIA WHOLE-BODY INHALATION EXPOSURES

INDIVIDUAL PUP BODY WEIGHTS (GRAMS)

GROUP 1 0 PPM LACTATION DAY 1

FEMALE#	MEAN	PUP# 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
1513	7.5	8.3	8.1	7.9	7.3	7.4	7.8	7.3	7.5	7.1	7.5	6.9	6.8	7.6	7.0					
1514	7.9	8.0	8.1	7.9	7.8	8.5	7.4	7.9	8.1	7.9	7.6	7.4								
1515	7.8	8.3	7.9	7.8	7.5	8.0	7.5	7.0	7.7	8.3	7.6	7.3	8.1							
1516	8.1	8.2	8.5	7.7	7.9	8.6	8.2	7.9	8.9	8.5	7.9	8.3	7.6	7.4	8.0					
1517	8.2	8.3	8.7	8.3	8.5	8.5	8.0	8.3	7.6	8.0	7.4									
1518	7.1	7.5	7.5	7.5	7.5	7.8	7.2	7.2	6.8	7.0	6.7	6.7	6.1	6.9	7.1					
1519	6.7	6.7	6.9	6.9	6.2	7.0	6.1	6.9	7.4	6.9	6.5	6.4	6.2	6.8	7.1	6.7	6.6			
1520	7.6	8.2	7.1	7.5	8.2	8.4	M	7.6	7.3	7.1	7.2	7.6	7.5	7.2	7.4					
1521	7.2	7.0	6.8	7.6	5.5	7.0	7.2	7.8	7.5	7.5	7.3	7.3	7.3	7.5	7.8	6.9	7.4			
1522	7.6	7.8	7.8	7.7	D	8.1	8.2	6.7	7.3	7.5	7.0	7.3	7.7	7.8	7.7					
1523	6.5	7.1	6.9	6.6	6.5	6.9	6.6	6.4	6.1	6.3	6.1	6.7	6.3	6.4						
1524	6.3	6.4	6.4	7.0	6.4	6.0	6.6	6.1	6.5	6.6	6.3	6.0	5.8	6.1	5.8	6.2	6.2	6.2		

MEAN	7.4
S.D.	0.61
N	12

PUP STATUS CODES: D-DIED M-MISSING

APPENDIX GG

PROPANE: COMBINED REPEATED-EXPOSURE TOXICITY, REPRODUCTION AND NEUROTOXICITY SCREENING IN RATS VIA WHOLE-BODY INHALATION EXPOSURES

INDIVIDUAL PUP BODY WEIGHTS (GRAMS)

GROUP 2 1200 PPM LACTATION DAY 1

FEMALE#	MEAN	PUP# 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
2513	NP																			
2514	7.0	7.1	7.5	7.2	7.7	8.0	6.8	6.8	6.4	6.6	6.7	6.7	6.6	6.9						
2515	7.2	7.5	7.4	7.1	7.4	7.9	7.4	7.6	7.2	6.8	7.8	7.2	7.2	6.5	7.2	6.0	7.4	7.1		
2516	7.3	7.4	7.6	7.4	7.3	7.4	7.5	7.4	6.9	7.2	6.9	7.6	6.5	7.9	7.1	7.1	6.8			
2517	7.4	7.9	7.7	7.2	8.0	7.3	7.9	7.7	7.1	6.7	7.1	7.1	6.9	7.5	7.4	7.3	7.6			
2518	7.3	7.4	7.6	7.4	7.5	7.6	7.1	7.4	7.2	7.8	5.8	7.0	7.1	7.5	7.6	7.4	7.3	6.9		
2519	6.1	6.6	6.2	6.6	6.6	6.6	6.6	5.3	5.7	5.7	5.5	6.2	5.6	6.2	5.9	6.0	6.1			
2520	7.8	7.8	7.7	8.2	7.4	8.2	8.6	8.4	7.5	7.6	7.7	7.5	7.5	7.7	7.3					
2521	7.7	7.1	8.0	7.5	8.2	8.0	7.5	7.9	7.2	7.9	8.3	7.2	7.4	8.3						
2522	6.4	6.9	6.7	6.4	6.4	6.4	6.7	6.6	6.2	6.4	6.0	6.0	6.1	6.0	6.3	6.6				
2523	6.8	6.7	6.3	7.4	6.7	7.5	6.9	6.3	7.1	6.5	6.9	6.9	6.7	6.3						
2524	6.7	7.0	8.0	7.0	7.3	7.0	6.7	6.8	6.2	6.6	6.5	6.8	6.7	6.9	6.1	6.3	5.9	6.8		
MEAN	7.1																			
S.D.	0.53																			
N	11																			

NP=Not Pregnant

APPENDIX GG

PROPANE: COMBINED REPEATED-EXPOSURE TOXICITY, REPRODUCTION AND NEUROTOXICITY SCREENING IN RATS VIA WHOLE-BODY INHALATION EXPOSURES

INDIVIDUAL PUP BODY WEIGHTS (GRAMS)

GROUP 3 4000 PPM LACTATION DAY 1

FEMALE#	MEAN	PUP# 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
3513	7.5	8.1	7.7	7.3	7.6	8.5	7.1	7.1	8.0	7.1	7.2	7.4	7.3							
3514	6.4	6.5	5.8	6.5	6.5	6.8	7.1	6.4	6.5	M	6.3	5.2								
3515	7.4	8.1	7.5	7.5	7.5	7.5	7.8	7.8	7.7	7.0	M	7.1	6.5	7.7	7.1	7.0	6.7			
3516	7.7	7.8	7.8	7.9	7.8	7.9	7.5	7.5	7.4	7.3	8.0	7.7	7.3	7.6	7.6					
3517	6.2	6.5	6.6	4.1	6.7	7.0	6.9	6.0	6.4	6.1	6.1	5.9	5.8	6.3						
3518	6.0	6.1	6.6	6.5	6.6	6.2	6.0	6.3	5.8	5.8	6.4	5.0	6.0	5.8	5.6	5.9				
3519	7.7	8.1	8.8	8.4	8.1	6.6	7.6	7.5	7.5	8.0	6.2									
3520	6.8	6.5	7.0	6.7	7.3	7.7	6.1	6.5	6.3	6.4	6.8	7.0	6.9	6.9	6.6	7.4				
3521	7.4	7.3	7.7	7.2	M	7.6	6.9	7.7	7.7	7.1	7.1	7.7	7.1	7.9	6.9					
3522	TLL																			
3523	8.1	8.0	8.0	8.2	8.7	7.7	8.2	7.8												
3524	6.2	6.7	6.1	6.1	6.5	6.2	6.8	6.3	5.9	6.8	6.0	6.4	6.0	6.6	D	6.4	4.0	6.3		

MEAN	7.0
S.D.	0.73
N	11

PUP STATUS CODES: D-DIED M-MISSING TLL=Total Litter Loss

APPENDIX GG

PROPANE: COMBINED REPEATED-EXPOSURE TOXICITY, REPRODUCTION AND NEUROTOXICITY SCREENING IN RATS VIA WHOLE-BODY INHALATION EXPOSURES

INDIVIDUAL PUP BODY WEIGHTS (GRAMS)

GROUP 4 12000 PPM LACTATION DAY 1

FEMALE#	MEAN	PUP# 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
4513	7.5	7.9	8.1	7.5	7.5	8.5	7.4	7.5	8.0	7.1	7.6	6.9	7.3	6.6	7.1	7.1				
4514	6.3	5.7	6.6	6.7	6.3	6.4	6.2	6.7	5.8	6.6	6.0	5.5	6.4	6.7	6.0					
4515	6.0	6.4	6.8	6.1	5.9	5.2	6.0	5.9	6.5	4.7	6.4	6.3	6.0	5.7						
4516	6.7	6.8	7.1	6.7	7.0	7.2	7.1	6.6	6.5	6.2	6.6	7.0	6.6	6.2	6.6					
4517	6.6	S	S	6.3	6.3	7.5	6.8	7.0	7.2	7.1	6.3	6.3	6.6	6.5	6.0	6.6	6.6	6.5	6.7	
4518	7.2	7.9	7.6	7.6	7.9	7.2	7.3	7.3	7.5	7.2	6.7	6.8	6.0	7.2	6.7					
4519	7.6	7.6	7.4	7.1	7.9	7.9	7.6	7.7	7.8	7.5	8.1	7.8	7.4	7.2	7.2	7.1				
4520	7.4	S	S	S	7.7	7.3	7.7	8.4	7.5	7.0	7.7	7.3	6.7	8.0	6.9	7.3	6.1			
4521	7.2	7.9	7.7	7.6	6.2	6.7	7.6	7.9	7.7	7.1	7.3	7.2	7.4	6.7	7.1	6.8	7.2	6.9		
4522	6.2	6.5	6.8	6.4	6.5	6.6	6.0	6.2	6.1	6.5	6.1	5.4	5.7	6.1	6.3	5.8				
4523	6.6	7.2	6.9	6.8	6.9	6.6	6.6	6.8	5.8	6.6	6.1	6.1	6.4	6.8						
4524	TLL																			
MEAN	6.8																			
S.D.	0.55																			
N	11																			

PUP STATUS CODES: S-STILLBORN

APPENDIX GG

PROPANE: COMBINED REPEATED-EXPOSURE TOXICITY, REPRODUCTION
AND NEUROTOXICITY SCREENING IN RATS VIA WHOLE-BODY
INHALATION EXPOSURES

INDIVIDUAL PUP BODY WEIGHTS (GRAMS)

GROUP 1 0 PPM LACTATION DAY 4

FEMALE#	MEAN	PUP# 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
1513	10.8	12.1	11.1	11.5	10.8	10.9	11.3	10.1	11.2	10.5	10.8	10.2	10.5	11.0	9.8					
1514	10.9	11.1	11.3	10.6	11.3	11.3	10.1	10.9	11.0	11.4	10.7	10.1								
1515	10.6	11.1	10.6	11.0	10.7	10.8	10.4	10.0	10.6	11.3	9.6	10.1	11.1							
1516	11.2	11.3	11.4	11.7	11.7	12.1	11.7	10.0	11.5	10.5	10.8	11.6	11.2	9.8	11.0					
1517	12.1	11.9	12.2	12.5	12.6	12.4	11.9	12.6	11.3	12.0	11.5									
1518	10.4	11.0	10.8	10.8	11.2	11.5	10.4	10.7	9.6	10.3	9.6	10.1	8.9	9.9	10.3					
1519	9.3	9.6	10.3	10.0	8.4	10.0	9.2	9.2	9.9	9.3	8.2	8.6	8.8	8.7	10.1	9.3	9.6			
1520	10.5	11.3	10.2	10.8	10.4	11.9	M	10.7	10.5	10.4	10.0	10.6	10.0	9.9	10.4					
1521	10.5	10.5	9.9	11.4	7.9	10.4	9.7	12.2	10.4	10.7	10.7	10.7	10.5	11.1	11.8	11.0	9.9			
1522	10.8	11.2	11.0	11.1	D	11.3	11.1	9.6	10.5	10.4	9.7	10.7	10.6	11.3	11.4					
1523	9.6	10.1	10.2	9.7	9.6	9.7	9.6	9.5	9.1	9.4	8.8	9.6	9.7	9.5						
1524	8.3	8.1	8.8	8.7	8.0	7.8	9.2	9.0	9.5	8.2	7.9	7.7	8.1	7.9	7.9	8.2	8.4	7.7		

MEAN	10.4
S.D.	0.97
N	12

PUP STATUS CODES: D-DIED M-MISSING

APPENDIX GG

PROPANE: COMBINED REPEATED-EXPOSURE TOXICITY, REPRODUCTION
AND NEUROTOXICITY SCREENING IN RATS VIA WHOLE-BODY
INHALATION EXPOSURES

INDIVIDUAL PUP BODY WEIGHTS (GRAMS)

GROUP 2 1200 PPM LACTATION DAY 4

FEMALE#	MEAN	PUP# 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
2513																				
2514	10.2	10.4	10.5	10.4	10.9	10.4	10.5	10.0	10.0	10.3	9.7	10.1	9.4	10.3						
2515	10.4	11.0	10.3	11.0	11.0	11.5	10.3	11.3	10.6	10.2	11.0	10.1	10.3	9.2	10.9	8.0	9.7	10.8		
2516	10.3	10.8	10.6	10.1	10.1	10.7	10.4	10.7	10.2	10.3	9.7	11.1	9.4	10.9	10.0	10.0	M			
2517	10.5	11.1	11.7	10.2	11.5	10.0	10.9	11.5	10.2	8.6	10.3	9.8	10.2	10.4	10.5	10.0	11.6			
2518	9.6	10.3	9.4	9.8	10.2	9.6	9.4	9.4	9.6	10.7	7.5	9.3	9.3	10.1	10.5	9.6	9.3	9.2		
2519	8.6	9.2	8.3	9.1	9.2	9.5	9.3	7.9	8.4	8.5	7.2	8.3	8.4	8.7	8.6	8.0	8.9			
2520	11.1	11.2	11.7	11.6	11.0	10.9	11.8	11.2	10.9	10.8	10.9	11.1	11.1	11.0	10.7					
2521	11.4	9.9	12.0	10.9	12.2	11.8	11.5	11.4	10.6	11.8	12.3	11.0	11.2	12.1						
2522	8.5	9.4	8.3	8.6	8.3	8.2	9.1	9.2	7.7	7.9	8.4	8.5	8.6	8.6	8.5	8.3				
2523	10.5	10.4	9.9	11.6	10.5	11.6	10.6	10.5	10.7	10.5	10.6	10.1	10.1	9.7						
2524	10.0	9.4	11.2	10.6	11.2	9.8	10.8	10.2	8.8	9.6	9.7	9.9	10.0	9.8	9.9	9.5	9.1	10.4		
MEAN	10.1																			
S.D.	0.92																			
N	11																			

PUP STATUS CODES: M-MISSING

APPENDIX GG

PROPANE: COMBINED REPEATED-EXPOSURE TOXICITY, REPRODUCTION
AND NEUROTOXICITY SCREENING IN RATS VIA WHOLE-BODY
INHALATION EXPOSURES

INDIVIDUAL PUP BODY WEIGHTS (GRAMS)

GROUP 3 4000 PPM LACTATION DAY 4

FEMALE#	MEAN	PUP# 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
3513	9.3	9.9	9.3	9.0	9.5	10.4	9.2	9.0	9.5	9.0	9.0	9.2	9.2							
3514	9.5	10.5	8.9	9.3	10.0	10.2	10.7	9.0	9.9	M	9.1	7.5								
3515	10.5	11.0	11.9	10.4	10.5	11.6	10.0	11.4	9.8	9.8	M	10.0	9.9	11.1	10.6	10.3	8.9			
3516	10.3	10.6	11.1	10.4	10.2	10.6	10.5	10.1	9.6	9.4	10.4	9.9	10.0	10.4	10.4					
3517	9.5	10.2	9.9	6.5	10.2	10.4	10.4	9.7	9.5	9.1	9.3	9.4	9.0	9.6						
3518	8.1	8.3	8.5	8.4	8.4	8.4	8.4	8.3	7.7	7.6	8.6	8.0	7.9	7.7	7.4	8.4				
3519	11.6	11.9	13.1	13.0	11.9	10.4	11.6	11.3	11.4	12.1	9.0									
3520	9.8	9.9	9.8	10.0	10.6	11.0	8.7	9.4	9.2	9.0	9.7	9.9	10.0	9.5	9.8	9.9				
3521	10.6	11.1	11.1	11.1	M	10.7	10.3	11.3	10.3	10.5	10.0	10.7	10.2	10.6	10.0					
3522																				
3523	12.5	12.8	12.3	12.6	13.7	11.7	12.6	11.9												
3524	9.5	10.2	9.6	9.2	10.1	9.4	10.7	10.1	9.2	10.2	9.4	10.1	9.7	9.7	D	9.3	6.3	8.7		

MEAN	10.1
S.D.	1.19
N	11

PUP STATUS CODES: D-DIED M-MISSING

APPENDIX GG

PROPANE: COMBINED REPEATED-EXPOSURE TOXICITY, REPRODUCTION
AND NEUROTOXICITY SCREENING IN RATS VIA WHOLE-BODY
INHALATION EXPOSURES

INDIVIDUAL PUP BODY WEIGHTS (GRAMS)

GROUP 4 12000 PPM LACTATION DAY 4

FEMALE#	MEAN	PUP# 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
4513	10.6	11.0	11.2	10.4	10.4	12.1	11.1	11.0	11.6	10.1	10.2	10.0	10.5	9.6	9.5	10.2				
4514	9.7	8.4	10.8	9.5	9.5	10.1	9.7	10.9	9.2	9.6	9.3	8.9	10.2	10.1	9.4					
4515	8.9	9.1	10.2	8.6	9.5	7.6	9.5	8.7	9.5	7.3	9.5	9.2	8.8	8.2						
4516	9.5	9.8	9.4	10.0	9.7	10.3	10.1	8.8	9.0	9.3	9.3	9.3	9.3	9.0	9.1					
4517	9.4	S	S	7.8	9.4	10.6	8.9	10.4	10.3	11.0	8.6	9.1	9.4	10.1	8.4	9.4	8.7	9.0	9.0	
4518	10.4	11.8	10.4	10.5	11.0	10.2	10.0	10.8	10.1	10.9	10.0	10.7	8.9	9.6	10.2					
4519	9.3	9.3	9.2	8.8	10.1	9.4	9.6	9.8	9.7	9.1	9.4	9.7	9.1	8.8	9.3	8.8				
4520	10.5	S	S	S	11.0	11.2	10.5	10.2	11.1	10.8	11.3	10.5	9.5	11.0	10.2	10.6	9.2			
4521	10.2	10.8	10.2	11.0	9.4	9.4	10.3	10.5	10.6	10.5	10.0	10.0	10.0	9.4	10.3	9.8	9.8	10.7		
4522	9.2	9.8	D	9.5	9.8	10.0	9.0	9.1	9.0	9.6	9.1	8.7	8.6	9.5	8.9	8.8				
4523	9.6	10.4	9.8	9.6	9.9	9.2	9.8	10.0	8.7	9.6	9.4	9.3	9.4	9.5						
4524																				
MEAN	9.8																			
S.D.	0.57																			
N	11																			

PUP STATUS CODES: S-STILLBORN D-DIED

APPENDIX HH

PROPANE: COMBINED REPEATED-EXPOSURE TOXICITY, REPRODUCTION
AND NEUROTOXICITY SCREENING IN RATS VIA WHOLE-BODY
INHALATION EXPOSURES

INDIVIDUAL PUP NECROPSY OBSERVATIONS

GROUP 1 0 PPM

FEMALE#	PUP#	STATUS	DAY	ORGAN	OBSERVATION
1513	1M	K	4		NO REMARKABLE OBSERVATIONS
	2M	K	4		NO REMARKABLE OBSERVATIONS
	3M	K	4		NO REMARKABLE OBSERVATIONS
	4M	K	4		NO REMARKABLE OBSERVATIONS
	5M	K	4		NO REMARKABLE OBSERVATIONS
	6M	K	4		NO REMARKABLE OBSERVATIONS
	7M	K	4		NO REMARKABLE OBSERVATIONS
	8F	K	4		NO REMARKABLE OBSERVATIONS
	9F	K	4		NO REMARKABLE OBSERVATIONS
	10F	K	4		NO REMARKABLE OBSERVATIONS
	11F	K	4		NO REMARKABLE OBSERVATIONS
	12F	K	4		NO REMARKABLE OBSERVATIONS
	13F	K	4		NO REMARKABLE OBSERVATIONS
	14F	K	4		NO REMARKABLE OBSERVATIONS
1514	1M	K	4		NO REMARKABLE OBSERVATIONS
	2M	K	4		NO REMARKABLE OBSERVATIONS
	3M	K	4		NO REMARKABLE OBSERVATIONS
	4M	K	4		NO REMARKABLE OBSERVATIONS
	5M	K	4		NO REMARKABLE OBSERVATIONS
	6M	K	4		NO REMARKABLE OBSERVATIONS
	7M	K	4		NO REMARKABLE OBSERVATIONS
	8F	K	4		NO REMARKABLE OBSERVATIONS
	9F	K	4		NO REMARKABLE OBSERVATIONS
	10F	K	4		NO REMARKABLE OBSERVATIONS
	11F	K	4		NO REMARKABLE OBSERVATIONS
1515	1M	K	4		NO REMARKABLE OBSERVATIONS
	2M	K	4		NO REMARKABLE OBSERVATIONS
	3M	K	4		NO REMARKABLE OBSERVATIONS
	4M	K	4		NO REMARKABLE OBSERVATIONS
	5F	K	4		NO REMARKABLE OBSERVATIONS
	6F	K	4		NO REMARKABLE OBSERVATIONS

SEX CODES: M-Male, F=Female, U=Undetermined
PUP STATUS CODES: K-SCHEDULED SACRIFICE

APPENDIX HH

PROPANE: COMBINED REPEATED-EXPOSURE TOXICITY, REPRODUCTION
AND NEUROTOXICITY SCREENING IN RATS VIA WHOLE-BODY
INHALATION EXPOSURES

INDIVIDUAL PUP NECROPSY OBSERVATIONS

GROUP 1 0 PPM

FEMALE#	PUP#	STATUS	DAY	ORGAN	OBSERVATION
1515 (CONTINUED)					
	7F	K	4		NO REMARKABLE OBSERVATIONS
	8F	K	4		NO REMARKABLE OBSERVATIONS
	9F	K	4		NO REMARKABLE OBSERVATIONS
	10F	K	4		NO REMARKABLE OBSERVATIONS
	11F	K	4		NO REMARKABLE OBSERVATIONS
	12F	K	4		NO REMARKABLE OBSERVATIONS
1516	1M	K	4		NO REMARKABLE OBSERVATIONS
	2M	K	4		NO REMARKABLE OBSERVATIONS
	3M	K	4		NO REMARKABLE OBSERVATIONS
	4M	K	4		NO REMARKABLE OBSERVATIONS
	5M	K	4		NO REMARKABLE OBSERVATIONS
	6M	K	4		NO REMARKABLE OBSERVATIONS
	7M	K	4		NO REMARKABLE OBSERVATIONS
	8M	K	4		NO REMARKABLE OBSERVATIONS
	9M	K	4		NO REMARKABLE OBSERVATIONS
	10M	K	4		NO REMARKABLE OBSERVATIONS
	11M	K	4		NO REMARKABLE OBSERVATIONS
	12F	K	4		NO REMARKABLE OBSERVATIONS
	13F	K	4		NO REMARKABLE OBSERVATIONS
	14F	K	4		NO REMARKABLE OBSERVATIONS
1517	1M	K	4		NO REMARKABLE OBSERVATIONS
	2M	K	4		NO REMARKABLE OBSERVATIONS
	3M	K	4		NO REMARKABLE OBSERVATIONS
	4M	K	4		NO REMARKABLE OBSERVATIONS
	5M	K	4		NO REMARKABLE OBSERVATIONS
	6F	K	4		NO REMARKABLE OBSERVATIONS
	7F	K	4		NO REMARKABLE OBSERVATIONS
	8F	K	4		NO REMARKABLE OBSERVATIONS
	9F	K	4		NO REMARKABLE OBSERVATIONS
	10F	K	4		NO REMARKABLE OBSERVATIONS

SEX CODES: M-Male, F=Female, U=Undetermined
PUP STATUS CODES: K-SCHEDULED SACRIFICE

APPENDIX HH

PROPANE: COMBINED REPEATED-EXPOSURE TOXICITY, REPRODUCTION
AND NEUROTOXICITY SCREENING IN RATS VIA WHOLE-BODY
INHALATION EXPOSURES

INDIVIDUAL PUP NECROPSY OBSERVATIONS

GROUP 1 0 PPM

FEMALE#	PUP#	STATUS	DAY	ORGAN	OBSERVATION
1518	1M	K	4		NO REMARKABLE OBSERVATIONS
	2M	K	4		NO REMARKABLE OBSERVATIONS
	3M	K	4		NO REMARKABLE OBSERVATIONS
	4M	K	4		NO REMARKABLE OBSERVATIONS
	5M	K	4		NO REMARKABLE OBSERVATIONS
	6M	K	4		NO REMARKABLE OBSERVATIONS
	7F	K	4		NO REMARKABLE OBSERVATIONS
	8F	K	4		NO REMARKABLE OBSERVATIONS
	9F	K	4		NO REMARKABLE OBSERVATIONS
	10F	K	4		NO REMARKABLE OBSERVATIONS
	11F	K	4		NO REMARKABLE OBSERVATIONS
	12F	K	4		NO REMARKABLE OBSERVATIONS
	13F	K	4		NO REMARKABLE OBSERVATIONS
	14F	K	4		NO REMARKABLE OBSERVATIONS
1519	1M	K	4		NO REMARKABLE OBSERVATIONS
	2M	K	4		NO REMARKABLE OBSERVATIONS
	3M	K	4		NO REMARKABLE OBSERVATIONS
	4M	K	4		NO REMARKABLE OBSERVATIONS
	5M	K	4		NO REMARKABLE OBSERVATIONS
	6M	K	4		NO REMARKABLE OBSERVATIONS
	7M	K	4		NO REMARKABLE OBSERVATIONS
	8M	K	4		NO REMARKABLE OBSERVATIONS
	9M	K	4		NO REMARKABLE OBSERVATIONS
	10F	K	4		NO REMARKABLE OBSERVATIONS
	11F	K	4		NO REMARKABLE OBSERVATIONS
	12F	K	4		NO REMARKABLE OBSERVATIONS
	13F	K	4		NO REMARKABLE OBSERVATIONS
	14F	K	4		NO REMARKABLE OBSERVATIONS
	15F	K	4		NO REMARKABLE OBSERVATIONS
	16F	K	4		NO REMARKABLE OBSERVATIONS

SEX CODES: M-Male, F=Female, U=Undetermined
PUP STATUS CODES: K-SCHEDULED SACRIFICE

APPENDIX HH

PROPANE: COMBINED REPEATED-EXPOSURE TOXICITY, REPRODUCTION AND NEUROTOXICITY SCREENING IN RATS VIA WHOLE-BODY INHALATION EXPOSURES

INDIVIDUAL PUP NECROPSY OBSERVATIONS

GROUP 1 0 PPM

FEMALE#	PUP#	STATUS	DAY	ORGAN	OBSERVATION
1520	1M	K	4		NO REMARKABLE OBSERVATIONS
	2M	K	4		NO REMARKABLE OBSERVATIONS
	3M	K	4		NO REMARKABLE OBSERVATIONS
	4M	K	4		NO REMARKABLE OBSERVATIONS
	5M	K	4		NO REMARKABLE OBSERVATIONS
	7F	K	4		NO REMARKABLE OBSERVATIONS
	8F	K	4		NO REMARKABLE OBSERVATIONS
	9F	K	4		NO REMARKABLE OBSERVATIONS
	10F	K	4		NO REMARKABLE OBSERVATIONS
	11F	K	4		NO REMARKABLE OBSERVATIONS
	12F	K	4		NO REMARKABLE OBSERVATIONS
	13F	K	4		NO REMARKABLE OBSERVATIONS
	14F	K	4		NO REMARKABLE OBSERVATIONS
1521	1M	K	4		NO REMARKABLE OBSERVATIONS
	2M	K	4		NO REMARKABLE OBSERVATIONS
	3M	K	4		NO REMARKABLE OBSERVATIONS
	4M	K	4		NO REMARKABLE OBSERVATIONS
	5M	K	4		NO REMARKABLE OBSERVATIONS
	6M	K	4		NO REMARKABLE OBSERVATIONS
	7M	K	4		NO REMARKABLE OBSERVATIONS
	8M	K	4		NO REMARKABLE OBSERVATIONS
	9M	K	4		NO REMARKABLE OBSERVATIONS
	10F	K	4		NO REMARKABLE OBSERVATIONS
	11F	K	4		NO REMARKABLE OBSERVATIONS
	12F	K	4		NO REMARKABLE OBSERVATIONS
	13F	K	4		NO REMARKABLE OBSERVATIONS
	14F	K	4		NO REMARKABLE OBSERVATIONS
	15F	K	4		NO REMARKABLE OBSERVATIONS
	16F	K	4		NO REMARKABLE OBSERVATIONS

SEX CODES: M-Male, F=Female, U=Undetermined
PUP STATUS CODES: K-SCHEDULED SACRIFICE

APPENDIX HH

PROPANE: COMBINED REPEATED-EXPOSURE TOXICITY, REPRODUCTION AND NEUROTOXICITY SCREENING IN RATS VIA WHOLE-BODY INHALATION EXPOSURES

INDIVIDUAL PUP NECROPSY OBSERVATIONS

GROUP 1 0 PPM

FEMALE#	PUP#	STATUS	DAY	ORGAN	OBSERVATION
1522	1M	K	4		NO REMARKABLE OBSERVATIONS
	2M	K	4		NO REMARKABLE OBSERVATIONS
	3M	K	4		NO REMARKABLE OBSERVATIONS
	4M	D	1	LUNGS	LUNG FLOATATION TEST- FOUND DEAD
				STOMACH	MILK IN STOMACH
	5M	K	4		NO REMARKABLE OBSERVATIONS
	6F	K	4		NO REMARKABLE OBSERVATIONS
	7F	K	4		NO REMARKABLE OBSERVATIONS
	8F	K	4		NO REMARKABLE OBSERVATIONS
	9F	K	4		NO REMARKABLE OBSERVATIONS
	10F	K	4		NO REMARKABLE OBSERVATIONS
	11F	K	4		NO REMARKABLE OBSERVATIONS
	12F	K	4		NO REMARKABLE OBSERVATIONS
	13F	K	4		NO REMARKABLE OBSERVATIONS
	14F	K	4		NO REMARKABLE OBSERVATIONS
1523	1M	K	4		NO REMARKABLE OBSERVATIONS
	2M	K	4		NO REMARKABLE OBSERVATIONS
	3M	K	4		NO REMARKABLE OBSERVATIONS
	4M	K	4		NO REMARKABLE OBSERVATIONS
	5M	K	4		NO REMARKABLE OBSERVATIONS
	6F	K	4		NO REMARKABLE OBSERVATIONS
	7F	K	4		NO REMARKABLE OBSERVATIONS
	8F	K	4		NO REMARKABLE OBSERVATIONS
	9F	K	4		NO REMARKABLE OBSERVATIONS
	10F	K	4		NO REMARKABLE OBSERVATIONS
	11F	K	4		NO REMARKABLE OBSERVATIONS
	12F	K	4		NO REMARKABLE OBSERVATIONS
	13F	K	4	EXTERNAL EXAM	TAIL MISSING ONLY PROXIMAL AREA PRESENT.

SEX CODES: M-Male, F=Female, U=Undetermined
PUP STATUS CODES: D-DIED K-SCHEDULED SACRIFICE

APPENDIX HH

PROPANE: COMBINED REPEATED-EXPOSURE TOXICITY, REPRODUCTION AND NEUROTOXICITY SCREENING IN RATS VIA WHOLE-BODY INHALATION EXPOSURES

INDIVIDUAL PUP NECROPSY OBSERVATIONS

GROUP 1 0 PPM

FEMALE#	PUP#	STATUS	DAY	ORGAN	OBSERVATION
1524	1M	K	4		NO REMARKABLE OBSERVATIONS
	2M	K	4		NO REMARKABLE OBSERVATIONS
	3M	K	4		NO REMARKABLE OBSERVATIONS
	4M	K	4		NO REMARKABLE OBSERVATIONS
	5M	K	4		NO REMARKABLE OBSERVATIONS
	6M	K	4		NO REMARKABLE OBSERVATIONS
	7M	K	4		NO REMARKABLE OBSERVATIONS
	8M	K	4		NO REMARKABLE OBSERVATIONS
	9M	K	4		NO REMARKABLE OBSERVATIONS
	10F	K	4		NO REMARKABLE OBSERVATIONS
	11F	K	4		NO REMARKABLE OBSERVATIONS
	12F	K	4		NO REMARKABLE OBSERVATIONS
	13F	K	4		NO REMARKABLE OBSERVATIONS
	14F	K	4		NO REMARKABLE OBSERVATIONS
	15F	K	4		NO REMARKABLE OBSERVATIONS
	16F	K	4		NO REMARKABLE OBSERVATIONS
	17F	K	4		NO REMARKABLE OBSERVATIONS

SEX CODES: M-Male, F=Female, U=Undetermined
PUP STATUS CODES: K-SCHEDULED SACRIFICE

APPENDIX HH

PROPANE: COMBINED REPEATED-EXPOSURE TOXICITY, REPRODUCTION AND NEUROTOXICITY SCREENING IN RATS VIA WHOLE-BODY INHALATION EXPOSURES

INDIVIDUAL PUP NECROPSY OBSERVATIONS

GROUP 2 1200 PPM

FEMALE#	PUP#	STATUS	DAY	ORGAN	OBSERVATION
2514	1M	K	4		NO REMARKABLE OBSERVATIONS
	2M	K	4		NO REMARKABLE OBSERVATIONS
	3M	K	4		NO REMARKABLE OBSERVATIONS
	4M	K	4		NO REMARKABLE OBSERVATIONS
	5M	K	4		NO REMARKABLE OBSERVATIONS
	6M	K	4		NO REMARKABLE OBSERVATIONS
	7F	K	4		NO REMARKABLE OBSERVATIONS
	8F	K	4		NO REMARKABLE OBSERVATIONS
	9F	K	4		NO REMARKABLE OBSERVATIONS
	10F	K	4		NO REMARKABLE OBSERVATIONS
	11F	K	4		NO REMARKABLE OBSERVATIONS
	12F	K	4		NO REMARKABLE OBSERVATIONS
	13F	K	4		NO REMARKABLE OBSERVATIONS
2515	1M	K	4		NO REMARKABLE OBSERVATIONS
	2M	K	4		NO REMARKABLE OBSERVATIONS
	3M	K	4		NO REMARKABLE OBSERVATIONS
	4M	K	4		NO REMARKABLE OBSERVATIONS
	5M	K	4		NO REMARKABLE OBSERVATIONS
	6M	K	4		NO REMARKABLE OBSERVATIONS
	7M	K	4		NO REMARKABLE OBSERVATIONS
	8M	K	4		NO REMARKABLE OBSERVATIONS
	9M	K	4		NO REMARKABLE OBSERVATIONS
	10F	K	4		NO REMARKABLE OBSERVATIONS
	11F	K	4		NO REMARKABLE OBSERVATIONS
	12F	K	4		NO REMARKABLE OBSERVATIONS
	13F	K	4		NO REMARKABLE OBSERVATIONS
	14F	K	4		NO REMARKABLE OBSERVATIONS
	15F	K	4		NO REMARKABLE OBSERVATIONS
	16F	K	4		NO REMARKABLE OBSERVATIONS
	17F	K	4		NO REMARKABLE OBSERVATIONS

SEX CODES: M-Male, F=Female, U=Undetermined
PUP STATUS CODES: K-SCHEDULED SACRIFICE

APPENDIX HH

PROPANE: COMBINED REPEATED-EXPOSURE TOXICITY, REPRODUCTION AND NEUROTOXICITY SCREENING IN RATS VIA WHOLE-BODY INHALATION EXPOSURES

INDIVIDUAL PUP NECROPSY OBSERVATIONS

GROUP 2 1200 PPM

FEMALE#	PUP#	STATUS	DAY	ORGAN	OBSERVATION
2516	1M	K	4		NO REMARKABLE OBSERVATIONS
	2M	K	4		NO REMARKABLE OBSERVATIONS
	3M	K	4		NO REMARKABLE OBSERVATIONS
	4M	K	4		NO REMARKABLE OBSERVATIONS
	5M	K	4		NO REMARKABLE OBSERVATIONS
	6M	K	4		NO REMARKABLE OBSERVATIONS
	7M	K	4		NO REMARKABLE OBSERVATIONS
	8F	K	4		NO REMARKABLE OBSERVATIONS
	9F	K	4		NO REMARKABLE OBSERVATIONS
	10F	K	4		NO REMARKABLE OBSERVATIONS
	11F	K	4		NO REMARKABLE OBSERVATIONS
	12F	K	4		NO REMARKABLE OBSERVATIONS
	13F	K	4		NO REMARKABLE OBSERVATIONS
	14F	K	4		NO REMARKABLE OBSERVATIONS
	15F	K	4		NO REMARKABLE OBSERVATIONS
2517	1M	K	4		NO REMARKABLE OBSERVATIONS
	2M	K	4		NO REMARKABLE OBSERVATIONS
	3M	K	4		NO REMARKABLE OBSERVATIONS
	4M	K	4		NO REMARKABLE OBSERVATIONS
	5M	K	4		NO REMARKABLE OBSERVATIONS
	6M	K	4		NO REMARKABLE OBSERVATIONS
	7M	K	4		NO REMARKABLE OBSERVATIONS
	8M	K	4		NO REMARKABLE OBSERVATIONS
	9F	K	4		NO REMARKABLE OBSERVATIONS
	10F	K	4		NO REMARKABLE OBSERVATIONS
	11F	K	4		NO REMARKABLE OBSERVATIONS
	12F	K	4		NO REMARKABLE OBSERVATIONS
	13F	K	4		NO REMARKABLE OBSERVATIONS
	14F	K	4		NO REMARKABLE OBSERVATIONS
	15F	K	4		NO REMARKABLE OBSERVATIONS
	16F	K	4		NO REMARKABLE OBSERVATIONS

SEX CODES: M-Male, F=Female, U=Undetermined
PUP STATUS CODES: K-SCHEDULED SACRIFICE

APPENDIX HH

PROPANE: COMBINED REPEATED-EXPOSURE TOXICITY, REPRODUCTION
AND NEUROTOXICITY SCREENING IN RATS VIA WHOLE-BODY
INHALATION EXPOSURES

INDIVIDUAL PUP NECROPSY OBSERVATIONS

GROUP 2 1200 PPM

FEMALE#	PUP#	STATUS	DAY	ORGAN	OBSERVATION
2518	1M	K	4		NO REMARKABLE OBSERVATIONS
	2M	K	4		NO REMARKABLE OBSERVATIONS
	3M	K	4		NO REMARKABLE OBSERVATIONS
	4M	K	4		NO REMARKABLE OBSERVATIONS
	5M	K	4		NO REMARKABLE OBSERVATIONS
	6M	K	4		NO REMARKABLE OBSERVATIONS
	7M	K	4		NO REMARKABLE OBSERVATIONS
	8M	K	4		NO REMARKABLE OBSERVATIONS
	9M	K	4		NO REMARKABLE OBSERVATIONS
	10F	K	4		NO REMARKABLE OBSERVATIONS
	11F	K	4		NO REMARKABLE OBSERVATIONS
	12F	K	4		NO REMARKABLE OBSERVATIONS
	13F	K	4		NO REMARKABLE OBSERVATIONS
	14F	K	4		NO REMARKABLE OBSERVATIONS
	15F	K	4		NO REMARKABLE OBSERVATIONS
	16F	K	4		NO REMARKABLE OBSERVATIONS
	17F	K	4		NO REMARKABLE OBSERVATIONS
2519	1M	K	4		NO REMARKABLE OBSERVATIONS
	2M	K	4		NO REMARKABLE OBSERVATIONS
	3M	K	4		NO REMARKABLE OBSERVATIONS
	4M	K	4		NO REMARKABLE OBSERVATIONS
	5M	K	4		NO REMARKABLE OBSERVATIONS
	6M	K	4		NO REMARKABLE OBSERVATIONS
	7F	K	4		NO REMARKABLE OBSERVATIONS
	8F	K	4		NO REMARKABLE OBSERVATIONS
	9F	K	4		NO REMARKABLE OBSERVATIONS
	10F	K	4		NO REMARKABLE OBSERVATIONS
	11F	K	4		NO REMARKABLE OBSERVATIONS
	12F	K	4		NO REMARKABLE OBSERVATIONS
	13F	K	4		NO REMARKABLE OBSERVATIONS
	14F	K	4		NO REMARKABLE OBSERVATIONS
	15F	K	4		NO REMARKABLE OBSERVATIONS

SEX CODES: M-Male, F=Female, U=Undetermined
PUP STATUS CODES: K-SCHEDULED SACRIFICE

APPENDIX HH

PROPANE: COMBINED REPEATED-EXPOSURE TOXICITY, REPRODUCTION AND NEUROTOXICITY SCREENING IN RATS VIA WHOLE-BODY INHALATION EXPOSURES

INDIVIDUAL PUP NECROPSY OBSERVATIONS

GROUP 2 1200 PPM

FEMALE#	PUP#	STATUS	DAY	ORGAN	OBSERVATION
2519	(CONTINUED)				
	16F	K	4		NO REMARKABLE OBSERVATIONS
2520	1M	K	4		NO REMARKABLE OBSERVATIONS
	2M	K	4		NO REMARKABLE OBSERVATIONS
	3M	K	4		NO REMARKABLE OBSERVATIONS
	4M	K	4		NO REMARKABLE OBSERVATIONS
	5M	K	4		NO REMARKABLE OBSERVATIONS
	6M	K	4		NO REMARKABLE OBSERVATIONS
	7M	K	4		NO REMARKABLE OBSERVATIONS
	8M	K	4		NO REMARKABLE OBSERVATIONS
	9F	K	4		NO REMARKABLE OBSERVATIONS
	10F	K	4		NO REMARKABLE OBSERVATIONS
	11F	K	4		NO REMARKABLE OBSERVATIONS
	12F	K	4		NO REMARKABLE OBSERVATIONS
	13F	K	4		NO REMARKABLE OBSERVATIONS
	14F	K	4		NO REMARKABLE OBSERVATIONS
2521	1F	K	4		NO REMARKABLE OBSERVATIONS
	2M	K	4		NO REMARKABLE OBSERVATIONS
	3M	K	4		NO REMARKABLE OBSERVATIONS
	4M	K	4		NO REMARKABLE OBSERVATIONS
	5M	K	4		NO REMARKABLE OBSERVATIONS
	6M	K	4		NO REMARKABLE OBSERVATIONS
	7M	K	4		NO REMARKABLE OBSERVATIONS
	8M	K	4		NO REMARKABLE OBSERVATIONS
	9M	K	4		NO REMARKABLE OBSERVATIONS
	10M	K	4		NO REMARKABLE OBSERVATIONS
	11F	K	4		NO REMARKABLE OBSERVATIONS
	12F	K	4		NO REMARKABLE OBSERVATIONS
	13F	K	4		NO REMARKABLE OBSERVATIONS

SEX CODES: M-Male, F=Female, U=Undetermined
PUP STATUS CODES: K-SCHEDULED SACRIFICE

APPENDIX HH

PROPANE: COMBINED REPEATED-EXPOSURE TOXICITY, REPRODUCTION
AND NEUROTOXICITY SCREENING IN RATS VIA WHOLE-BODY
INHALATION EXPOSURES

INDIVIDUAL PUP NECROPSY OBSERVATIONS

GROUP 2 1200 PPM

FEMALE#	PUP#	STATUS	DAY	ORGAN	OBSERVATION
2522	1M	K	4		NO REMARKABLE OBSERVATIONS
	2M	K	4		NO REMARKABLE OBSERVATIONS
	3M	K	4		NO REMARKABLE OBSERVATIONS
	4M	K	4		NO REMARKABLE OBSERVATIONS
	5M	K	4		NO REMARKABLE OBSERVATIONS
	6M	K	4		NO REMARKABLE OBSERVATIONS
	7M	K	4		NO REMARKABLE OBSERVATIONS
	8F	K	4		NO REMARKABLE OBSERVATIONS
	9F	K	4		NO REMARKABLE OBSERVATIONS
	10F	K	4		NO REMARKABLE OBSERVATIONS
	11F	K	4		NO REMARKABLE OBSERVATIONS
	12F	K	4		NO REMARKABLE OBSERVATIONS
	13F	K	4		NO REMARKABLE OBSERVATIONS
	14F	K	4		NO REMARKABLE OBSERVATIONS
	15F	K	4		NO REMARKABLE OBSERVATIONS
2523	1M	K	4		NO REMARKABLE OBSERVATIONS
	2M	K	4		NO REMARKABLE OBSERVATIONS
	3M	K	4		NO REMARKABLE OBSERVATIONS
	4M	K	4		NO REMARKABLE OBSERVATIONS
	5F	K	4		NO REMARKABLE OBSERVATIONS
	6F	K	4		NO REMARKABLE OBSERVATIONS
	7F	K	4		NO REMARKABLE OBSERVATIONS
	8F	K	4		NO REMARKABLE OBSERVATIONS
	9F	K	4		NO REMARKABLE OBSERVATIONS
	10F	K	4		NO REMARKABLE OBSERVATIONS
	11F	K	4		NO REMARKABLE OBSERVATIONS
	12F	K	4		NO REMARKABLE OBSERVATIONS
	13F	K	4		NO REMARKABLE OBSERVATIONS
2524	1M	K	4		NO REMARKABLE OBSERVATIONS
	2M	K	4		NO REMARKABLE OBSERVATIONS
	3M	K	4		NO REMARKABLE OBSERVATIONS

SEX CODES: M-Male, F=Female, U=Undetermined
PUP STATUS CODES: K-SCHEDULED SACRIFICE

APPENDIX HH

PROPANE: COMBINED REPEATED-EXPOSURE TOXICITY, REPRODUCTION AND NEUROTOXICITY SCREENING IN RATS VIA WHOLE-BODY INHALATION EXPOSURES

INDIVIDUAL PUP NECROPSY OBSERVATIONS

GROUP 2 1200 PPM

FEMALE#	PUP#	STATUS	DAY	ORGAN	OBSERVATION
2524 (CONTINUED)					
	4M	K	4		NO REMARKABLE OBSERVATIONS
	5M	K	4		NO REMARKABLE OBSERVATIONS
	6M	K	4		NO REMARKABLE OBSERVATIONS
	7M	K	4		NO REMARKABLE OBSERVATIONS
	8F	K	4		NO REMARKABLE OBSERVATIONS
	9F	K	4		NO REMARKABLE OBSERVATIONS
	10F	K	4		NO REMARKABLE OBSERVATIONS
	11F	K	4		NO REMARKABLE OBSERVATIONS
	12F	K	4		NO REMARKABLE OBSERVATIONS
	13F	K	4		NO REMARKABLE OBSERVATIONS
	14F	K	4		NO REMARKABLE OBSERVATIONS
	15F	K	4		NO REMARKABLE OBSERVATIONS
	16F	K	4		NO REMARKABLE OBSERVATIONS
	17F	K	4		NO REMARKABLE OBSERVATIONS

SEX CODES: M-Male, F=Female, U=Undetermined
PUP STATUS CODES: K-SCHEDULED SACRIFICE

APPENDIX HH

PROPANE: COMBINED REPEATED-EXPOSURE TOXICITY, REPRODUCTION
AND NEUROTOXICITY SCREENING IN RATS VIA WHOLE-BODY
INHALATION EXPOSURES

INDIVIDUAL PUP NECROPSY OBSERVATIONS

GROUP 3 4000 PPM

FEMALE#	PUP#	STATUS	DAY	ORGAN	OBSERVATION
3513	1M	K	4		NO REMARKABLE OBSERVATIONS
	2M	K	4		NO REMARKABLE OBSERVATIONS
	3F	K	4		NO REMARKABLE OBSERVATIONS
	4F	K	4		NO REMARKABLE OBSERVATIONS
	5F	K	4		NO REMARKABLE OBSERVATIONS
	6F	K	4		NO REMARKABLE OBSERVATIONS
	7F	K	4		NO REMARKABLE OBSERVATIONS
	8F	K	4		NO REMARKABLE OBSERVATIONS
	9F	K	4		NO REMARKABLE OBSERVATIONS
	10F	K	4		NO REMARKABLE OBSERVATIONS
	11F	K	4		NO REMARKABLE OBSERVATIONS
	12F	K	4		NO REMARKABLE OBSERVATIONS
3514	1M	K	4		NO REMARKABLE OBSERVATIONS
	2M	K	4		NO REMARKABLE OBSERVATIONS
	3M	K	4		NO REMARKABLE OBSERVATIONS
	4M	K	4		NO REMARKABLE OBSERVATIONS
	5M	K	4		NO REMARKABLE OBSERVATIONS
	6M	K	4		NO REMARKABLE OBSERVATIONS
	7M	K	4		NO REMARKABLE OBSERVATIONS
	8M	K	4		NO REMARKABLE OBSERVATIONS
	10F	K	4		NO REMARKABLE OBSERVATIONS
	11F	K	4		NO REMARKABLE OBSERVATIONS
3515	1M	K	4		NO REMARKABLE OBSERVATIONS
	2M	K	4		NO REMARKABLE OBSERVATIONS
	3M	K	4		NO REMARKABLE OBSERVATIONS
	4M	K	4		NO REMARKABLE OBSERVATIONS
	5M	K	4		NO REMARKABLE OBSERVATIONS
	6M	K	4		NO REMARKABLE OBSERVATIONS
	7M	K	4		NO REMARKABLE OBSERVATIONS
	8M	K	4		NO REMARKABLE OBSERVATIONS
	9M	K	4		NO REMARKABLE OBSERVATIONS

SEX CODES: M-Male, F=Female, U=Undetermined
PUP STATUS CODES: K-SCHEDULED SACRIFICE

APPENDIX HH

PROPANE: COMBINED REPEATED-EXPOSURE TOXICITY, REPRODUCTION
AND NEUROTOXICITY SCREENING IN RATS VIA WHOLE-BODY
INHALATION EXPOSURES

INDIVIDUAL PUP NECROPSY OBSERVATIONS

GROUP 3 4000 PPM

FEMALE#	PUP#	STATUS	DAY	ORGAN	OBSERVATION
3515 (CONTINUED)					
	11F	K	4		NO REMARKABLE OBSERVATIONS
	12F	K	4		NO REMARKABLE OBSERVATIONS
	13F	K	4		NO REMARKABLE OBSERVATIONS
	14F	K	4		NO REMARKABLE OBSERVATIONS
	15F	K	4		NO REMARKABLE OBSERVATIONS
	16F	K	4		NO REMARKABLE OBSERVATIONS
3516	1M	K	4		NO REMARKABLE OBSERVATIONS
	2M	K	4		NO REMARKABLE OBSERVATIONS
	3M	K	4		NO REMARKABLE OBSERVATIONS
	4M	K	4		NO REMARKABLE OBSERVATIONS
	5M	K	4		NO REMARKABLE OBSERVATIONS
	6M	K	4		NO REMARKABLE OBSERVATIONS
	7F	K	4		NO REMARKABLE OBSERVATIONS
	8F	K	4		NO REMARKABLE OBSERVATIONS
	9F	K	4		NO REMARKABLE OBSERVATIONS
	10F	K	4		NO REMARKABLE OBSERVATIONS
	11F	K	4		NO REMARKABLE OBSERVATIONS
	12F	K	4		NO REMARKABLE OBSERVATIONS
	13F	K	4		NO REMARKABLE OBSERVATIONS
	14F	K	4		NO REMARKABLE OBSERVATIONS
3517	1M	K	4		NO REMARKABLE OBSERVATIONS
	2M	K	4		NO REMARKABLE OBSERVATIONS
	3M	K	4		NO REMARKABLE OBSERVATIONS
	4M	K	4		NO REMARKABLE OBSERVATIONS
	5M	K	4		NO REMARKABLE OBSERVATIONS
	6M	K	4		NO REMARKABLE OBSERVATIONS
	7M	K	4		NO REMARKABLE OBSERVATIONS
	8M	K	4		NO REMARKABLE OBSERVATIONS
	9F	K	4		NO REMARKABLE OBSERVATIONS
	10F	K	4		NO REMARKABLE OBSERVATIONS
	11F	K	4		NO REMARKABLE OBSERVATIONS

SEX CODES: M-Male, F=Female, U=Undetermined
PUP STATUS CODES: K-SCHEDULED SACRIFICE

APPENDIX HH

PROPANE: COMBINED REPEATED-EXPOSURE TOXICITY, REPRODUCTION
AND NEUROTOXICITY SCREENING IN RATS VIA WHOLE-BODY
INHALATION EXPOSURES

INDIVIDUAL PUP NECROPSY OBSERVATIONS

GROUP 3 4000 PPM

FEMALE#	PUP#	STATUS	DAY	ORGAN	OBSERVATION
3517 (CONTINUED)					
	12F	K	4		NO REMARKABLE OBSERVATIONS
	13F	K	4		NO REMARKABLE OBSERVATIONS
3518	1M	K	4		NO REMARKABLE OBSERVATIONS
	2M	K	4		NO REMARKABLE OBSERVATIONS
	3M	K	4		NO REMARKABLE OBSERVATIONS
	4M	K	4		NO REMARKABLE OBSERVATIONS
	5M	K	4		NO REMARKABLE OBSERVATIONS
	6M	K	4		NO REMARKABLE OBSERVATIONS
	7M	K	4		NO REMARKABLE OBSERVATIONS
	8M	K	4		NO REMARKABLE OBSERVATIONS
	9F	K	4		NO REMARKABLE OBSERVATIONS
	10F	K	4		NO REMARKABLE OBSERVATIONS
	11F	K	4		NO REMARKABLE OBSERVATIONS
	12F	K	4		NO REMARKABLE OBSERVATIONS
	13F	K	4		NO REMARKABLE OBSERVATIONS
	14F	K	4		NO REMARKABLE OBSERVATIONS
	15F	K	4		NO REMARKABLE OBSERVATIONS
3519	1M	K	4		NO REMARKABLE OBSERVATIONS
	2M	K	4		NO REMARKABLE OBSERVATIONS
	3M	K	4		NO REMARKABLE OBSERVATIONS
	4M	K	4		NO REMARKABLE OBSERVATIONS
	5F	K	4		NO REMARKABLE OBSERVATIONS
	6F	K	4		NO REMARKABLE OBSERVATIONS
	7F	K	4		NO REMARKABLE OBSERVATIONS
	8F	K	4		NO REMARKABLE OBSERVATIONS
	9F	K	4		NO REMARKABLE OBSERVATIONS
	10F	K	4		NO REMARKABLE OBSERVATIONS
3520	1M	K	4		NO REMARKABLE OBSERVATIONS
	2M	K	4		NO REMARKABLE OBSERVATIONS
	3M	K	4		NO REMARKABLE OBSERVATIONS

SEX CODES: M-Male, F=Female, U=Undetermined
PUP STATUS CODES: K-SCHEDULED SACRIFICE

APPENDIX HH

PROPANE: COMBINED REPEATED-EXPOSURE TOXICITY, REPRODUCTION
AND NEUROTOXICITY SCREENING IN RATS VIA WHOLE-BODY
INHALATION EXPOSURES

INDIVIDUAL PUP NECROPSY OBSERVATIONS

GROUP 3 4000 PPM

FEMALE#	PUP#	STATUS	DAY	ORGAN	OBSERVATION
3520 (CONTINUED)					
	4M	K	4		NO REMARKABLE OBSERVATIONS
	5M	K	4		NO REMARKABLE OBSERVATIONS
	6M	K	4		NO REMARKABLE OBSERVATIONS
	7F	K	4		NO REMARKABLE OBSERVATIONS
	8F	K	4		NO REMARKABLE OBSERVATIONS
	9F	K	4		NO REMARKABLE OBSERVATIONS
	10F	K	4		NO REMARKABLE OBSERVATIONS
	11F	K	4		NO REMARKABLE OBSERVATIONS
	12F	K	4		NO REMARKABLE OBSERVATIONS
	13F	K	4		NO REMARKABLE OBSERVATIONS
	14F	K	4		NO REMARKABLE OBSERVATIONS
	15F	K	4		NO REMARKABLE OBSERVATIONS
3521	1M	K	4		NO REMARKABLE OBSERVATIONS
	2M	K	4		NO REMARKABLE OBSERVATIONS
	3M	K	4		NO REMARKABLE OBSERVATIONS
	5M	K	4		NO REMARKABLE OBSERVATIONS
	6F	K	4		NO REMARKABLE OBSERVATIONS
	7F	K	4		NO REMARKABLE OBSERVATIONS
	8F	K	4		NO REMARKABLE OBSERVATIONS
	9F	K	4		NO REMARKABLE OBSERVATIONS
	10F	K	4		NO REMARKABLE OBSERVATIONS
	11F	K	4		NO REMARKABLE OBSERVATIONS
	12F	K	4		NO REMARKABLE OBSERVATIONS
	13F	K	4		NO REMARKABLE OBSERVATIONS
	14F	K	4		NO REMARKABLE OBSERVATIONS
3522	1F	D	0	LUNGS	LUNG FLOATATION TEST- FOUND DEAD
				STOMACH	NO MILK IN STOMACH
	2M	Z	0	GROSS EXAM	CANNIBALIZED
	3F	Z	0	GROSS EXAM	CANNIBALIZED
	4M	D	0	LUNGS	LUNG FLOATATION TEST- FOUND DEAD
				STOMACH	NO MILK IN STOMACH

SEX CODES: M-Male, F=Female, U=Undetermined
PUP STATUS CODES: S-STILLBORN D-DIED Z-CANNIBALIZED K-SCHEDULED SACRIFICE

APPENDIX HH

PROPANE: COMBINED REPEATED-EXPOSURE TOXICITY, REPRODUCTION
AND NEUROTOXICITY SCREENING IN RATS VIA WHOLE-BODY
INHALATION EXPOSURES

INDIVIDUAL PUP NECROPSY OBSERVATIONS

GROUP 3 4000 PPM

FEMALE#	PUP#	STATUS	DAY	ORGAN	OBSERVATION
3522 (CONTINUED)					
	5M	Z	0	GROSS EXAM	CANNIBALIZED
	6M	Z	0	GROSS EXAM	CANNIBALIZED
				STOMACH	NO MILK IN STOMACH
	7M	Z	0	GROSS EXAM	CANNIBALIZED
				STOMACH	NO MILK IN STOMACH
	8F	Z	0	GROSS EXAM	CANNIBALIZED
				STOMACH	NO MILK IN STOMACH
	9M	Z	0	GROSS EXAM	CANNIBALIZED
				STOMACH	NO MILK IN STOMACH
	10M	Z	0	GROSS EXAM	CANNIBALIZED
				STOMACH	NO MILK IN STOMACH
	11M	D	0	LUNGS	LUNG FLOATATION TEST- FOUND DEAD
				STOMACH	NO MILK IN STOMACH
	12M	S		LUNGS	LUNG FLOATATION TEST- STILLBORN
				STOMACH	NO MILK IN STOMACH
	13M	S		LUNGS	LUNG FLOATATION TEST- STILLBORN
				STOMACH	NO MILK IN STOMACH
	14F	S		GROSS EXAM	CANNIBALIZED
				LUNGS	LUNG FLOATATION TEST- STILLBORN
				STOMACH	NO MILK IN STOMACH
	15F	S		LUNGS	LUNG FLOATATION TEST- STILLBORN
				STOMACH	NO MILK IN STOMACH
	16F	S		LUNGS	LUNG FLOATATION TEST- STILLBORN
				STOMACH	NO MILK IN STOMACH
	17U	D	0	GROSS EXAM	CANNIBALIZED
				LUNGS	LUNG FLOATATION TEST- FOUND DEAD
3523	1M	K	4		NO REMARKABLE OBSERVATIONS
	2M	K	4		NO REMARKABLE OBSERVATIONS
	3M	K	4		NO REMARKABLE OBSERVATIONS
	4M	K	4		NO REMARKABLE OBSERVATIONS
	5F	K	4		NO REMARKABLE OBSERVATIONS
	6F	K	4		NO REMARKABLE OBSERVATIONS

SEX CODES: M-Male, F=Female, U=Undetermined
PUP STATUS CODES: S-STILLBORN D-DIED Z-CANNIBALIZED K-SCHEDULED SACRIFICE

APPENDIX HH

PROPANE: COMBINED REPEATED-EXPOSURE TOXICITY, REPRODUCTION AND NEUROTOXICITY SCREENING IN RATS VIA WHOLE-BODY INHALATION EXPOSURES

INDIVIDUAL PUP NECROPSY OBSERVATIONS

GROUP 3 4000 PPM

FEMALE#	PUP#	STATUS	DAY	ORGAN	OBSERVATION
3523	(CONTINUED)				
	7F	K	4		NO REMARKABLE OBSERVATIONS
3524	1M	K	4		NO REMARKABLE OBSERVATIONS
	2M	K	4		NO REMARKABLE OBSERVATIONS
	3M	K	4		NO REMARKABLE OBSERVATIONS
	4M	K	4		NO REMARKABLE OBSERVATIONS
	5M	K	4		NO REMARKABLE OBSERVATIONS
	6M	K	4		NO REMARKABLE OBSERVATIONS
	7M	K	4		NO REMARKABLE OBSERVATIONS
	8M	K	4		NO REMARKABLE OBSERVATIONS
	9M	K	4		NO REMARKABLE OBSERVATIONS
	10M	K	4		NO REMARKABLE OBSERVATIONS
	11M	K	4		NO REMARKABLE OBSERVATIONS
	12F	K	4		NO REMARKABLE OBSERVATIONS
	13F	K	4		NO REMARKABLE OBSERVATIONS
	14F	D	1	LUNGS	LUNG FLOATATION TEST- FOUND DEAD
				STOMACH	MILK IN STOMACH
	15F	K	4		NO REMARKABLE OBSERVATIONS
	16F	K	4		NO REMARKABLE OBSERVATIONS
	17F	K	4		NO REMARKABLE OBSERVATIONS

SEX CODES: M-Male, F=Female, U=Undetermined
PUP STATUS CODES: D-DIED K-SCHEDULED SACRIFICE

APPENDIX HH

PROPANE: COMBINED REPEATED-EXPOSURE TOXICITY, REPRODUCTION
AND NEUROTOXICITY SCREENING IN RATS VIA WHOLE-BODY
INHALATION EXPOSURES

INDIVIDUAL PUP NECROPSY OBSERVATIONS

GROUP 4 12000 PPM

FEMALE#	PUP#	STATUS	DAY	ORGAN	OBSERVATION
4513	1M	K	4		NO REMARKABLE OBSERVATIONS
	2M	K	4		NO REMARKABLE OBSERVATIONS
	3M	K	4		NO REMARKABLE OBSERVATIONS
	4M	K	4		NO REMARKABLE OBSERVATIONS
	5M	K	4		NO REMARKABLE OBSERVATIONS
	6M	K	4		NO REMARKABLE OBSERVATIONS
	7M	K	4		NO REMARKABLE OBSERVATIONS
	8F	K	4		NO REMARKABLE OBSERVATIONS
	9F	K	4		NO REMARKABLE OBSERVATIONS
	10F	K	4		NO REMARKABLE OBSERVATIONS
	11F	K	4		NO REMARKABLE OBSERVATIONS
	12F	K	4		NO REMARKABLE OBSERVATIONS
	13F	K	4		NO REMARKABLE OBSERVATIONS
	14F	K	4		NO REMARKABLE OBSERVATIONS
	15F	K	4		NO REMARKABLE OBSERVATIONS
4514	1M	K	4		NO REMARKABLE OBSERVATIONS
	2M	K	4		NO REMARKABLE OBSERVATIONS
	3M	K	4		NO REMARKABLE OBSERVATIONS
	4M	K	4		NO REMARKABLE OBSERVATIONS
	5M	K	4		NO REMARKABLE OBSERVATIONS
	6M	K	4		NO REMARKABLE OBSERVATIONS
	7M	K	4		NO REMARKABLE OBSERVATIONS
	8F	K	4		NO REMARKABLE OBSERVATIONS
	9F	K	4		NO REMARKABLE OBSERVATIONS
	10F	K	4		NO REMARKABLE OBSERVATIONS
	11F	K	4		NO REMARKABLE OBSERVATIONS
	12F	K	4		NO REMARKABLE OBSERVATIONS
	13F	K	4		NO REMARKABLE OBSERVATIONS
	14F	K	4		NO REMARKABLE OBSERVATIONS

SEX CODES: M-Male, F=Female, U=Undetermined
PUP STATUS CODES: K-SCHEDULED SACRIFICE

APPENDIX HH

PROPANE: COMBINED REPEATED-EXPOSURE TOXICITY, REPRODUCTION
AND NEUROTOXICITY SCREENING IN RATS VIA WHOLE-BODY
INHALATION EXPOSURES

INDIVIDUAL PUP NECROPSY OBSERVATIONS

GROUP 4 12000 PPM

FEMALE#	PUP#	STATUS	DAY	ORGAN	OBSERVATION
4515	1M	K	4		NO REMARKABLE OBSERVATIONS
	2M	K	4		NO REMARKABLE OBSERVATIONS
	3M	K	4		NO REMARKABLE OBSERVATIONS
	4M	K	4		NO REMARKABLE OBSERVATIONS
	5F	K	4		NO REMARKABLE OBSERVATIONS
	6F	K	4		NO REMARKABLE OBSERVATIONS
	7F	K	4		NO REMARKABLE OBSERVATIONS
	8F	K	4		NO REMARKABLE OBSERVATIONS
	9F	K	4		NO REMARKABLE OBSERVATIONS
	10F	K	4		NO REMARKABLE OBSERVATIONS
	11F	K	4		NO REMARKABLE OBSERVATIONS
	12F	K	4		NO REMARKABLE OBSERVATIONS
	13F	K	4		NO REMARKABLE OBSERVATIONS
4516	1M	K	4		NO REMARKABLE OBSERVATIONS
	2M	K	4		NO REMARKABLE OBSERVATIONS
	3M	K	4		NO REMARKABLE OBSERVATIONS
	4M	K	4		NO REMARKABLE OBSERVATIONS
	5M	K	4		NO REMARKABLE OBSERVATIONS
	6M	K	4		NO REMARKABLE OBSERVATIONS
	7F	K	4		NO REMARKABLE OBSERVATIONS
	8F	K	4		NO REMARKABLE OBSERVATIONS
	9F	K	4		NO REMARKABLE OBSERVATIONS
	10F	K	4		NO REMARKABLE OBSERVATIONS
	11F	K	4		NO REMARKABLE OBSERVATIONS
	12F	K	4		NO REMARKABLE OBSERVATIONS
	13F	K	4		NO REMARKABLE OBSERVATIONS
	14F	K	4		NO REMARKABLE OBSERVATIONS
4517	1M	S		LUNGS	LUNG FLOATATION TEST- STILLBORN
				STOMACH	NO MILK IN STOMACH
	2M	S		LUNGS	LUNG FLOATATION TEST- STILLBORN
				STOMACH	NO MILK IN STOMACH

SEX CODES: M-Male, F=Female, U=Undetermined
PUP STATUS CODES: S-STILLBORN K-SCHEDULED SACRIFICE

APPENDIX HH

PROPANE: COMBINED REPEATED-EXPOSURE TOXICITY, REPRODUCTION
AND NEUROTOXICITY SCREENING IN RATS VIA WHOLE-BODY
INHALATION EXPOSURES

INDIVIDUAL PUP NECROPSY OBSERVATIONS

GROUP 4 12000 PPM

FEMALE#	PUP#	STATUS	DAY	ORGAN	OBSERVATION
4517 (CONTINUED)					
	3M	K	4		NO REMARKABLE OBSERVATIONS
	4M	K	4		NO REMARKABLE OBSERVATIONS
	5M	K	4		NO REMARKABLE OBSERVATIONS
	6M	K	4		NO REMARKABLE OBSERVATIONS
	7M	K	4		NO REMARKABLE OBSERVATIONS
	8M	K	4		NO REMARKABLE OBSERVATIONS
	9M	K	4		NO REMARKABLE OBSERVATIONS
	10M	K	4		NO REMARKABLE OBSERVATIONS
	11F	K	4		NO REMARKABLE OBSERVATIONS
	12F	K	4		NO REMARKABLE OBSERVATIONS
	13F	K	4		NO REMARKABLE OBSERVATIONS
	14F	K	4		NO REMARKABLE OBSERVATIONS
	15F	K	4		NO REMARKABLE OBSERVATIONS
	16F	K	4		NO REMARKABLE OBSERVATIONS
	17F	K	4		NO REMARKABLE OBSERVATIONS
	18F	K	4		NO REMARKABLE OBSERVATIONS
4518	1M	K	4		NO REMARKABLE OBSERVATIONS
	2M	K	4		NO REMARKABLE OBSERVATIONS
	3M	K	4		NO REMARKABLE OBSERVATIONS
	4M	K	4		NO REMARKABLE OBSERVATIONS
	5M	K	4		NO REMARKABLE OBSERVATIONS
	6M	K	4		NO REMARKABLE OBSERVATIONS
	7F	K	4		NO REMARKABLE OBSERVATIONS
	8F	K	4		NO REMARKABLE OBSERVATIONS
	9F	K	4		NO REMARKABLE OBSERVATIONS
	10F	K	4		NO REMARKABLE OBSERVATIONS
	11F	K	4		NO REMARKABLE OBSERVATIONS
	12F	K	4		NO REMARKABLE OBSERVATIONS
	13F	K	4		NO REMARKABLE OBSERVATIONS
	14F	K	4		NO REMARKABLE OBSERVATIONS

SEX CODES: M-Male, F=Female, U=Undetermined
PUP STATUS CODES: K-SCHEDULED SACRIFICE

APPENDIX HH

PROPANE: COMBINED REPEATED-EXPOSURE TOXICITY, REPRODUCTION AND NEUROTOXICITY SCREENING IN RATS VIA WHOLE-BODY INHALATION EXPOSURES

INDIVIDUAL PUP NECROPSY OBSERVATIONS

GROUP 4 12000 PPM

FEMALE#	PUP#	STATUS	DAY	ORGAN	OBSERVATION
4519	1M	K	4		NO REMARKABLE OBSERVATIONS
	2M	K	4		NO REMARKABLE OBSERVATIONS
	3M	K	4		NO REMARKABLE OBSERVATIONS
	4M	K	4		NO REMARKABLE OBSERVATIONS
	5M	K	4		NO REMARKABLE OBSERVATIONS
	6M	K	4		NO REMARKABLE OBSERVATIONS
	7M	K	4		NO REMARKABLE OBSERVATIONS
	8M	K	4		NO REMARKABLE OBSERVATIONS
	9M	K	4		NO REMARKABLE OBSERVATIONS
	10M	K	4		NO REMARKABLE OBSERVATIONS
	11M	K	4		NO REMARKABLE OBSERVATIONS
	12M	K	4		NO REMARKABLE OBSERVATIONS
	13F	K	4		NO REMARKABLE OBSERVATIONS
	14F	K	4		NO REMARKABLE OBSERVATIONS
	15F	K	4		NO REMARKABLE OBSERVATIONS
4520	1M	S		LUNGS	LUNG FLOATATION TEST- STILLBORN
				STOMACH	NO MILK IN STOMACH
	2F	S		LUNGS	LUNG FLOATATION TEST- STILLBORN
				STOMACH	NO MILK IN STOMACH
	3F	S		LUNGS	LUNG FLOATATION TEST- STILLBORN
				STOMACH	NO MILK IN STOMACH
	4M	K	4		NO REMARKABLE OBSERVATIONS
	5M	K	4		NO REMARKABLE OBSERVATIONS
	6M	K	4		NO REMARKABLE OBSERVATIONS
	7M	K	4		NO REMARKABLE OBSERVATIONS
	8M	K	4		NO REMARKABLE OBSERVATIONS
	9F	K	4		NO REMARKABLE OBSERVATIONS
	10F	K	4		NO REMARKABLE OBSERVATIONS
	11F	K	4		NO REMARKABLE OBSERVATIONS
	12F	K	4		NO REMARKABLE OBSERVATIONS
	13F	K	4		NO REMARKABLE OBSERVATIONS
	14F	K	4		NO REMARKABLE OBSERVATIONS

SEX CODES: M-Male, F=Female, U=Undetermined
PUP STATUS CODES: S-STILLBORN K-SCHEDULED SACRIFICE

APPENDIX HH

PROPANE: COMBINED REPEATED-EXPOSURE TOXICITY, REPRODUCTION
AND NEUROTOXICITY SCREENING IN RATS VIA WHOLE-BODY
INHALATION EXPOSURES

INDIVIDUAL PUP NECROPSY OBSERVATIONS

GROUP 4 12000 PPM

FEMALE#	PUP#	STATUS	DAY	ORGAN	OBSERVATION
4520 (CONTINUED)					
	15F	K	4		NO REMARKABLE OBSERVATIONS
	16F	K	4		NO REMARKABLE OBSERVATIONS
4521	1M	K	4		NO REMARKABLE OBSERVATIONS
	2M	K	4		NO REMARKABLE OBSERVATIONS
	3M	K	4		NO REMARKABLE OBSERVATIONS
	4M	K	4		NO REMARKABLE OBSERVATIONS
	5M	K	4		NO REMARKABLE OBSERVATIONS
	6M	K	4		NO REMARKABLE OBSERVATIONS
	7M	K	4		NO REMARKABLE OBSERVATIONS
	8M	K	4		NO REMARKABLE OBSERVATIONS
	9F	K	4		NO REMARKABLE OBSERVATIONS
	10F	K	4		NO REMARKABLE OBSERVATIONS
	11F	K	4		NO REMARKABLE OBSERVATIONS
	12F	K	4		NO REMARKABLE OBSERVATIONS
	13F	K	4		NO REMARKABLE OBSERVATIONS
	14F	K	4		NO REMARKABLE OBSERVATIONS
	15F	K	4		NO REMARKABLE OBSERVATIONS
	16F	K	4		NO REMARKABLE OBSERVATIONS
	17F	K	4		NO REMARKABLE OBSERVATIONS
4522	1M	K	4		NO REMARKABLE OBSERVATIONS
	2M	D	2	STOMACH	MILK IN STOMACH
				LUNGS	LUNG FLOATATION TEST- FOUND DEAD
	3M	K	4		NO REMARKABLE OBSERVATIONS
	4M	K	4		NO REMARKABLE OBSERVATIONS
	5M	K	4		NO REMARKABLE OBSERVATIONS
	6M	K	4		NO REMARKABLE OBSERVATIONS
	7M	K	4		NO REMARKABLE OBSERVATIONS
	8F	K	4		NO REMARKABLE OBSERVATIONS
	9F	K	4		NO REMARKABLE OBSERVATIONS
	10F	K	4		NO REMARKABLE OBSERVATIONS
	11F	K	4		NO REMARKABLE OBSERVATIONS

SEX CODES: M-Male, F=Female, U=Undetermined
PUP STATUS CODES: D-DIED K-SCHEDULED SACRIFICE

APPENDIX HH

PROPANE: COMBINED REPEATED-EXPOSURE TOXICITY, REPRODUCTION
AND NEUROTOXICITY SCREENING IN RATS VIA WHOLE-BODY
INHALATION EXPOSURES

INDIVIDUAL PUP NECROPSY OBSERVATIONS

GROUP 4 12000 PPM

FEMALE#	PUP#	STATUS	DAY	ORGAN	OBSERVATION
4522	(CONTINUED)				
	12F	K	4		NO REMARKABLE OBSERVATIONS
	13F	K	4		NO REMARKABLE OBSERVATIONS
	14F	K	4		NO REMARKABLE OBSERVATIONS
	15F	K	4		NO REMARKABLE OBSERVATIONS
4523	1M	K	4		NO REMARKABLE OBSERVATIONS
	2M	K	4		NO REMARKABLE OBSERVATIONS
	3M	K	4		NO REMARKABLE OBSERVATIONS
	4M	K	4		NO REMARKABLE OBSERVATIONS
	5F	K	4		NO REMARKABLE OBSERVATIONS
	6F	K	4		NO REMARKABLE OBSERVATIONS
	7F	K	4		NO REMARKABLE OBSERVATIONS
	8F	K	4		NO REMARKABLE OBSERVATIONS
	9F	K	4		NO REMARKABLE OBSERVATIONS
	10F	K	4		NO REMARKABLE OBSERVATIONS
	11F	K	4		NO REMARKABLE OBSERVATIONS
	12F	K	4		NO REMARKABLE OBSERVATIONS
	13M	K	4		NO REMARKABLE OBSERVATIONS
4524	1M	D	0	LUNGS	LUNG FLOATATION TEST- FOUND DEAD
				STOMACH	MILK IN STOMACH
	2M	S			NO REMARKABLE OBSERVATIONS
	3M	D	0	LUNGS	LUNG FLOATATION TEST- FOUND DEAD
				STOMACH	MILK IN STOMACH
	4F	S		GROSS EXAM	AUTOLYSIS
					UNABLE TO PERFORM EXAMINATION
	5F	S			NO REMARKABLE OBSERVATIONS
	6F	S			NO REMARKABLE OBSERVATIONS
	7F	S			NO REMARKABLE OBSERVATIONS
	8F	S			NO REMARKABLE OBSERVATIONS
	9F	S			NO REMARKABLE OBSERVATIONS
	10F	S			NO REMARKABLE OBSERVATIONS
	11U	Z	0	GROSS EXAM	CANNIBALIZED

SEX CODES: M-Male, F=Female, U=Undetermined
PUP STATUS CODES: S-STILLBORN D-DIED Z-CANNIBALIZED K-SCHEDULED SACRIFICE

APPENDIX HH

PROPANE: COMBINED REPEATED-EXPOSURE TOXICITY, REPRODUCTION AND NEUROTOXICITY SCREENING IN RATS VIA WHOLE-BODY INHALATION EXPOSURES

INDIVIDUAL PUP NECROPSY OBSERVATIONS

GROUP 4 12000 PPM

FEMALE#	PUP#	STATUS	DAY	ORGAN	OBSERVATION
4524	(CONTINUED)				
	12U	Z	0	GROSS EXAM	CANNIBALIZED
	13U	Z	0	GROSS EXAM	CANNIBALIZED

SEX CODES: M-Male, F=Female, U=Undetermined
PUP STATUS CODES: S-STILLBORN Z-CANNIBALIZED

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1. INTRODUCTION

This appendix presents the methodology for exposure atmosphere generation monitoring and results.

2. MATERIALS AND METHODS

2.1. HUSBANDRY DURING EXPOSURE PERIODS

2.1.1. HOUSING

Animals were individually housed in a 1000 liter glass and stainless steel whole-body exposure chamber. The placement of the animals in the whole-body exposure chamber was rotated daily to ensure uniform exposure of the animals. A description of the animal rotation is included in the raw data.

2.1.2. FEED

None was provided during exposure.

2.1.3. WATER

None was provided during exposure.

2.1.4. ENVIRONMENTAL CONDITIONS

Chamber temperature and relative humidity were recorded every half-hour during exposure and maintained, to the maximum extent possible, within the ranges presented below. Excursions outside the specified range did not affect the integrity of the study.

Temperature

Desired:	20 to 24°C
Actual:	20 to 25°C

Relative Humidity

Desired:	40 to 60%
Actual:	29 to 64%

2.2. TEST SUBSTANCE ADMINISTRATION AND CHAMBER OPERATIONS

2.2.1. ROUTE OF ADMINISTRATION

Inhalation as a gas, via whole-body exposures

2.2.2. TEST SUBSTANCE ADMINISTRATION

The test substance was administered as a gas in the breathing air of the animals. The test atmosphere was generated by an appropriate procedure determined during the pre-study trials. The trials were performed (at least two 6-hour periods) to evaluate the optimal set of conditions and equipment to generate a stable atmosphere at the target exposure levels and maintain uniform conditions throughout the exposure chambers. During this time, samples were taken to determine the distribution of the test substance in the exposure chamber.

2.2.3. TARGET EXPOSURE LEVELS

Group 1 - 0 ppm
Group 2 - 1200 ppm
Group 3 - 4000 ppm
Group 4 - 12000 ppm

2.2.4. DURATION AND FREQUENCY OF ADMINISTRATION

Main Study male rats were exposed once daily, seven days/week for 2 weeks prior to mating initiation. Exposure of Main Study male rats (12/group) continued during the mating and post-mating periods until euthanized for a minimum exposure of 28 days. Main Study female rats (12/group) were exposed once daily, seven days/week for a minimum exposure of 28 days. Satellite female rats (12/group) for the reproduction study were exposed once daily, seven days/week for at least two weeks prior to mating initiation. Satellite female rats continued to be treated once daily during mating. Once mated, Satellite female rats were treated once daily during gestation (Days 0-19). Satellite female rats without

evidence of mating continued treatment for 19 days following completion of the mating period and were then held for an additional 7 days.

2.2.5. CHAMBER OPERATIONS

The whole-body exposure chambers each had a volume of approximately 1000 liters. The chambers were operated at a minimum flow rate of 200 liters per minute. The final airflow was set to provide at least one air change (calculated by dividing the chamber volume by the airflow rate) in 5.0 minutes (12 air changes/hour) and a T_{99} equilibrium time (calculated by multiplying the air change by the exponential factor 4.6) of at most 23 minutes. Initial settings for each group were as follows:

Group	Airflow Rate (Lpm)	Air Change (min)	T_{99} (min)
1	220	4.5	21
2	204	4.9	23
3	218	4.6	21
4	224	4.5	21

This chamber size and airflow rates were considered adequate to maintain the animal loading factor below 5% and the oxygen level at 19% or higher. At the end of the exposure, all animals remained in chamber for a minimum of 30 minutes. During this time, the chamber was operated at the same flow rate as used during the exposure using clean air only. Recordings of airflow rate and static pressure were made at the initiation of the exposures and every half-hour during the exposure.

The chamber atmospheres were exhausted through the in-house filtering system, which consisted of a coarse filter, a HEPA filter, and an activated charcoal bed.

See Figures 1 and 2, and Table III (Inhalation Report) for equipment list.

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2.2.6. EXPOSURE PROCEDURE

Group 1

Room air was directed into the inlet of 1000 liter glass and stainless steel exposure chamber.

Groups 2 - 4

The test substance was delivered from a single cylinder, through a regulator and two backpressure gauges, and branched, via ¼" tubing, to the three exposure chambers. For each chamber, ¼" tubing directed the test substance to a flowmeter, regulated by a metering valve, and into the inlet of a 1000 liter stainless steel and glass whole-body exposure chamber.

See Figures 1 and 2, and Table III (Inhalation Report) for equipment list.

2.3. EXPOSURE CONCENTRATION DETERMINATION

2.3.1. NOMINAL CONCENTRATION

A nominal exposure concentration (ppm) was calculated by dividing the average test substance flow (Lpm) during each exposure by the average chamber airflow (Lpm).

$$\text{Nominal (ppm)} = \frac{\text{Average Test Substance Flow (Lpm)}}{\text{Chamber Airflow (Lpm)}} \times 10^6 \mu L/L$$

An overall nominal exposure concentration (ppm) was also calculated by weighing the cylinder before and after each day of exposure and dividing the weight differential (grams) by the average (Groups 2-4) chamber airflow (Lpm).

$$\text{Nominal (ppm)} = \frac{\Delta Wt\ (g) \times 10^6\ \mu g/g \times 22.4\ \mu L/\mu mole \times 295K}{\text{Average Chamber Airflow (Lpm)} \times \text{Exposure Duration (min)} \times 44.11\ \mu g/\mu mole \times 273K}$$

See Table III for equipment list.

2.3.2. CHAMBER SAMPLING

Determination of the exposure levels were made using a MIRAN® Ambient Air analyzer equipped with a strip chart recorder. The test atmosphere was drawn from the normal sampling portal through the MIRAN® and measurements were recorded at least 4 times during each exposure. The exposure levels were determined by comparison of the measured absorbance to a calibrated response curve constructed using the same instrument settings.

See Table III (Inhalation Report) for equipment list.

2.3.3. PARTICLE SIZE DISTRIBUTION

Particle size samples were drawn once during each week of exposure for the chambers and room air using a TSI Aerodynamic Particle Sizer. The samples were drawn for 20 seconds at a rate of 5.0 Lpm. The mass median aerodynamic diameter, geometric standard deviation and total mass concentration were calculated. A computer was used to program the system to the appropriate settings prior to sampling. The particle size distributions were calculated by the computer and printed out.

See Table III (Inhalation Report) for equipment list.

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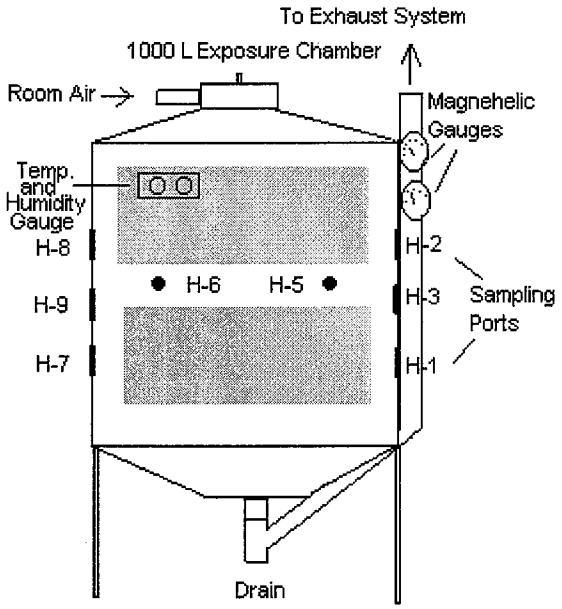
2.3.4. CHAMBER AND EXPOSURE ROOM ENVIRONMENT

Chamber oxygen levels (maintained at least 19%) were measured pretest and at the beginning, middle and end of the study. Air

samples were taken in the vapor generation area pretest and at the beginning, middle and end of the study. Light (maintained approximately 30-40 foot-candles at 1.0 meter above the floor) and noise levels (maintained below 85 decibels) in the exposure room were measured pretest and at the beginning, middle and end of the study.

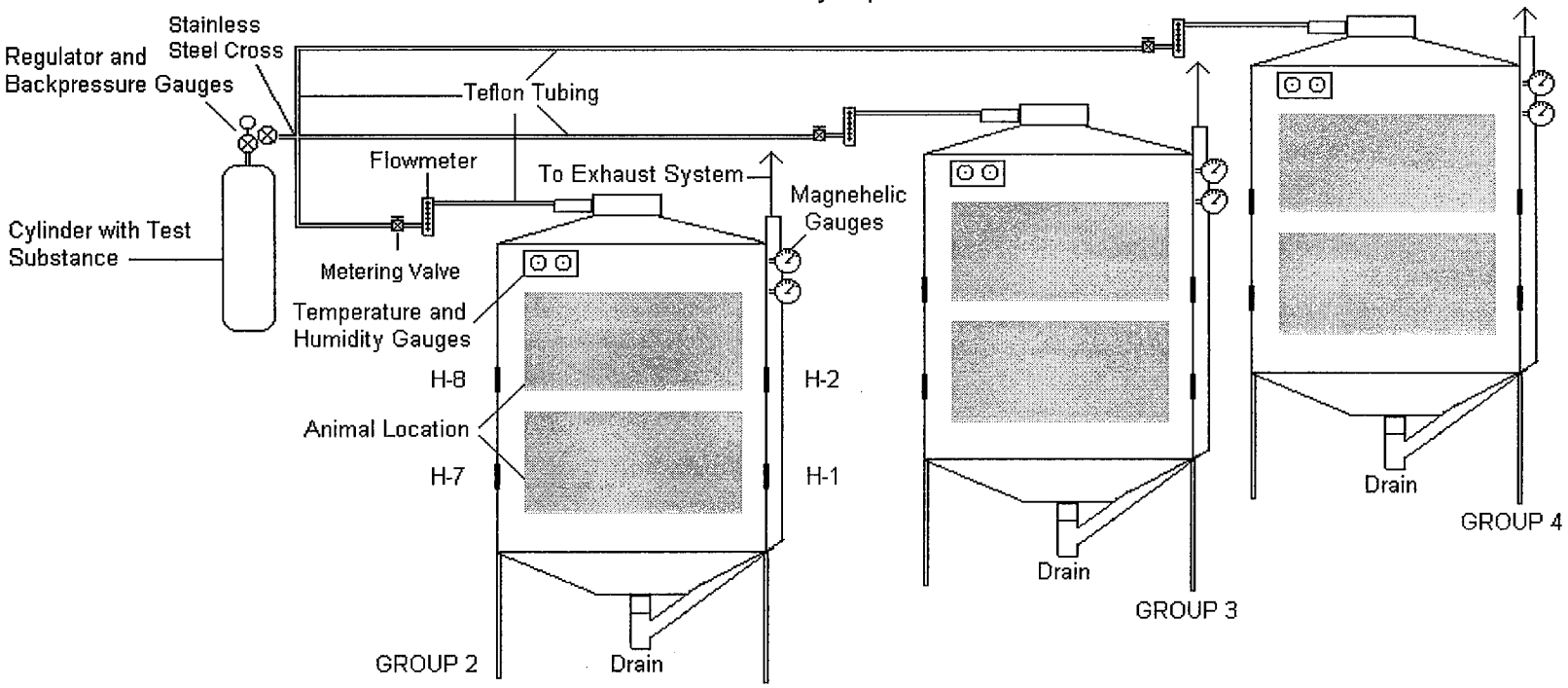
See Table III (Inhalation Report) for equipment list.

Figure I
Chamber Generation System
and Whole-Body Exposure Chamber



Note: Animals were individually housed on three levels within the exposure chamber.

Figure 2
Chamber Generation System
and Whole-Body Exposure Chamber



Note:

1. Sampling Ports H-11 (left-bottom), H-12 (left-top), H-13 (right-bottom) and H-14 (right-top) used for pretest distribution sampling, were located on the back wall of the chambers.
2. Animals were individually housed on up to three levels within the exposure chamber depending on the number of animals exposed on a given day.

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Table I
Summary of In-Chamber Observations

Exposure Day	**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**
Group 1 – 0 ppm														
Within Normal Limits	All	All	All	All	All	All	All	All	All	All	All	All	All	All
Group 2 – 1200 ppm														
Within Normal Limits	All	All	All	All	All	All	All	All	All	All	All	All	All	All
Group 3 – 4000 ppm														
Within Normal Limits	All	All	All	All	All	All	All	All	All	All	All	All	All	All
Group 4 – 12000 ppm														
Within Normal Limits	All	All	All	All	All	All	All	All	All	All	All	All	All	All

All = 100% of the animals exhibiting a given observation; Most = 51-99% of the animals exhibiting a given observation; Few = <20% of the animals exhibiting a given observation.
Note: In-chamber observations are based on all animals present in the exposure chamber at the time.

	Inhalation Report	Appendix II

Table I
Summary of In-Chamber Observations

Exposure Day	**14**	**15**	**16**	**17**	**18**	**19**	**20**	**21**	**22**	**23**	**24**	**25**	**26**
Group 1 – 0 ppm													
Within Normal Limits	All	All	All	All	All	All	All	All	All	All	All	All	All
Chromodacryorrhea													
Group 2 – 1200 ppm													
Within Normal Limits	All	All	All	All	All	All	All	All	All	All	All	All	All
Group 3 – 4000 ppm													
Within Normal Limits	All	All	All	All	All	All	All	All	All	All	All	All	All
Group 4 – 12000 ppm													
Within Normal Limits	All	All	All	All	All	All	All	All	All	All	All	All	All

All = 100% of the animals exhibiting a given observation; Most = 51-99% of the animals exhibiting a given observation; Few = <20% of the animals exhibiting a given observation.
Note: In-chamber observations are based on all animals present in the exposure chamber at the time.

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Table I
Summary of In-Chamber Observations

Exposure Day	**27**	**28**	**29**	**30**	**31**	**32**	**33**	**34**	**35**	**36**	**37**	**38**	**39**	**40**
Group 1 – 0 ppm														
Within Normal Limits	All	All	All	All	All	All	All	All	All	All	All			
Group 2 – 1200 ppm														
Within Normal Limits	All	All	All	All	All	All	All	All	All	All	All	All	All	All
Group 3 – 4000 ppm														
Within Normal Limits	All	All	All	All	All	All	All	All	All	All	All			
Group 4 – 12000 ppm														
Within Normal Limits	All	All	All	All	All	All	All	All	All	All	All			

All = 100% of the animals exhibiting a given observation; Most = 51-99% of the animals exhibiting a given observation; Few = <20% of the animals exhibiting a given observation.
Note: In-chamber observations are based on all animals present in the exposure chamber at the time.

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Table I
Summary of In-Chamber Observations

Exposure Day	**41**	**42**	**43**	**44**	**45**	**46**	**47**
Group 2 – 1200 ppm							
Within Normal Limits	All	All	All	All	All	All	All

All = 100% of the animals exhibiting a given observation; Most = 51-99% of the animals exhibiting a given observation; Few = <20% of the animals exhibiting a given observation.
Note: In-chamber observations are based on all animals present in the exposure chamber at the time.

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Table II
Chamber Monitoring Results
Preface

Key to Abbreviations

MMAD	=	Mass Median Aerodynamic Diameter
GSD	=	Geometric Standard Deviation
TMC	=	Total Mass Concentration
N (gf)	=	Nominal (by gas flow)
N (wt)	=	Nominal (by weight)

Chamber Monitoring Results
Cumulative Exposure Record
Group 1 - 0 ppm (Air Control)

Day	Date	Exposure Number	Nominal (ppm)	Analytical Chamber Concentration					Particle Size Determinations			Chamber Environment	
				Mean (ppm)	Individual (ppm)				MMAD (µm)	GSD	TMC (mg/m^3)	Mean Temperature (°C)	Humidity (%)
0	19-Jan-04	1	0	0.00	0.00	0.00	0.00	0.00				24	41
1	20-Jan-04	2	0	0.00	0.00	0.00	0.00	0.00				25	39
2	21-Jan-04	3	0	0.00	0.00	0.00	0.00	0.00				24	38
3	22-Jan-04	4	0	0.00	0.00	0.00	0.00	0.00	2.103	1.897	5.47E-03	25	41
4	23-Jan-04	5	0	0.00	0.00	0.00	0.00	0.00				24	36
5	24-Jan-04	6	0	0.00	0.00	0.00	0.00	0.00				24	40
6	25-Jan-04	7	0	0.00	0.00	0.00	0.00	0.00				24	38
7	26-Jan-04	8	0	0.00	0.00	0.00	0.00	0.00				24	39
8	27-Jan-04	9	0	0.00	0.00	0.00	0.00	0.00				25	42
9	28-Jan-04	10	0	0.00	0.00	0.00	0.00	0.00				25	43
10	29-Jan-04	11	0	0.00	0.00	0.00	0.00	0.00	2.204	2.382	2.67E-03	25	38
11	30-Jan-04	12	0	0.00	0.00	0.00	0.00	0.00				25	37
12	31-Jan-04	13	0	0.00	0.00	0.00	0.00	0.00				25	38
13	1-Feb-04	14	0	0.00	0.00	0.00	0.00	0.00				25	41
14	2-Feb-04	15	0	0.00	0.00	0.00	0.00	0.00				25	42
15	3-Feb-04	16	0	0.00	0.00	0.00	0.00	0.00				25	44
16	4-Feb-04	17	0	0.00	0.00	0.00	0.00	0.00				25	44
17	5-Feb-04	18	0	0.00	0.00	0.00	0.00	0.00	0.9756	1.803	1.65E-03	25	42
18	6-Feb-04	19	0	0.00	0.00	0.00	0.00	0.00				25	46
19	7-Feb-04	20	0	0.00	0.00	0.00	0.00	0.00				25	48
20	8-Feb-04	21	0	0.00	0.00	0.00	0.00	0.00				24	37
21	9-Feb-04	22	0	0.00	0.00	0.00	0.00	0.00				24	41
22	10-Feb-04	23	0	0.00	0.00	0.00	0.00	0.00				24	45
23	11-Feb-04	24	0	0.00	0.00	0.00	0.00	0.00				24	41
24	12-Feb-04	25	0	0.00	0.00	0.00	0.00	0.00	0.9653	1.740	1.07E-03	24	41
25	13-Feb-04	26	0	0.00	0.00	0.00	0.00	0.00				24	43
26	14-Feb-04	27	0	0.00	0.00	0.00	0.00	0.00				25	41

Chamber Monitoring Results
Cumulative Exposure Record
Group 1 - 0 ppm (Air Control)

Day	Date	Exposure Number	Nominal (ppm)	Analytical Chamber Concentration					Particle Size Determinations			Chamber Environment	
				Mean (ppm)	Individual (ppm)				MMAD (µm)	GSD	TMC (mg/m^3)	Mean Temperature (°C)	Humidity (%)
27	15-Feb-04	28	0	0.00	0.00	0.00	0.00	0.00				25	36
28	16-Feb-04	29	0	0.00	0.00	0.00	0.00	0.00				25	35
29	17-Feb-04	30	0	0.00	0.00	0.00	0.00	0.00				24	34
30	18-Feb-04	31	0	0.00	0.00	0.00	0.00	0.00				23	35
31	19-Feb-04	32	0	0.00	0.00	0.00	0.00	0.00	2.427	1.966	6.22E-03	23	36
32	20-Feb-04	33	0	0.00	0.00	0.00	0.00	0.00				23	39
33	21-Feb-04	34	0	0.00	0.00	0.00	0.00	0.00				22	46
34	22-Feb-04	35	0	0.00	0.00	0.00	0.00	0.00				22	36
35	23-Feb-04	36	0	0.00	0.00	0.00	0.00	0.00				22	35
36	24-Feb-04	37	0	0.00	0.00	0.00	0.00	0.00				22	41
37	25-Feb-04	38	0	0.00	0.00	0.00	0.00	0.00	4.962	2.174	4.09E-03	21	32
		Mean	**0**		**0.00**				**2.273**	**1.994**	**3.53E-03**	**24.1**	**39.8**
		S.D.	**0**		**0.00**				**1.46**	**0.24**	**0.00**	**1.1**	**3.7**

Chamber Monitoring Results
Cumulative Exposure Record
Group 2 - 1200 ppm

Day	Date	Exposure Number	Nominal (ppm)	Analytical Chamber Concentration					Particle Size Determinations			Chamber Environment	
				Mean (ppm)	Individual (ppm)				MMAD (µm)	GSD	TMC (mg/m^3)	Mean Temperature (°C)	Mean Humidity (%)
0	19-Jan-04	1	1290	1280	1300	1300	1260	1260				24	43
1	20-Jan-04	2	1270	1220	1250	1200	1210	1220				24	42
2	21-Jan-04	3	1270	1245	1240	1260	1240	1240				24	41
3	22-Jan-04	4	1270	1250	1240	1280	1210	1270	2.578	2.237	5.56E-03	24	43
4	23-Jan-04	5	1270	1243	1260	1210	1260	1240				24	38
5	24-Jan-04	6	1270	1258	1230	1280	1270	1250				24	43
6	25-Jan-04	7	1260	1253	1280	1240	1270	1220				24	40
7	26-Jan-04	8	1240	1180	1150	1170	1210	1190				24	41
8	27-Jan-04	9	1250	1230	1230	1230	1230	1230				24	45
9	28-Jan-04	10	1250	1220	1270	1190	1210	1210				24	45
10	29-Jan-04	11	1250	1228	1240	1210	1240	1220	2.132	1.967	2.88E-03	24	40
11	30-Jan-04	12	1250	1235	1240	1220	1240	1240				24	39
12	31-Jan-04	13	1250	1230	1250	1200	1230	1240				24	41
13	1-Feb-04	14	1250	1220	1230	1210	1210	1230				24	43
14	2-Feb-04	15	1250	1248	1230	1240	1270	1250				24	44
15	3-Feb-04	16	1250	1210	1200	1180	1220	1240				24	47
16	4-Feb-04	17	1250	1268	1250	1270	1270	1280				24	47
17	5-Feb-04	18	1250	1260	1260	1250	1270	1260	1.446	2.153	2.28E-03	24	44
18	6-Feb-04	19	1250	1255	1270	1240	1260	1250				24	50
19	7-Feb-04	20	1250	1238	1270	1230	1230	1220				24	51
20	8-Feb-04	21	1250	1283	1290	1270	1270	1300				24	39
21	9-Feb-04	22	1250	1300	1290	1280	1320	1310				24	44
22	10-Feb-04	23	1250	1200	1150	1240	1250	1160				24	48
23	11-Feb-04	24	1250	1250	1250	1240	1240	1270				24	45
24	12-Feb-04	25	1250	1253	1260	1250	1240	1260	1.153	1.896	1.32E-03	24	44
25	13-Feb-04	26	1250	1250	1260	1240	1250	1250				24	46
26	14-Feb-04	27	1250	1193	1210	1200	1160	1200				24	43

Chamber Monitoring Results
Cumulative Exposure Record
Group 2 - 1200 ppm

Day	Date	Exposure Number	Nominal (ppm)	Analytical Chamber Concentration					Particle Size Determinations			Chamber Environment	
				Mean (ppm)	Individual (ppm)				MMAD (µm)	GSD	TMC (mg/m^3)	Mean Temperature (°C)	Mean Humidity (%)
27	15-Feb-04	28	1250	1238	1250	1250	1220	1230				24	39
28	16-Feb-04	29	1250	1270	1310	1240	1250	1280				24	37
29	17-Feb-04	30	1250	1243	1250	1230	1240	1250				23	36
30	18-Feb-04	31	1250	1198	1200	1170	1190	1230				22	37
31	19-Feb-04	32	1250	1225	1200	1200	1260	1240	2.618	1.956	7.25E-03	22	39
32	20-Feb-04	33	1250	1205	1240	1180	1200	1200				22	42
33	21-Feb-04	34	1250	1235	1240	1270	1220	1210				22	48
34	22-Feb-04	35	1250	1203	1180	1220	1220	1190				22	38
35	23-Feb-04	36	1250	1250	1260	1280	1240	1220				22	37
36	24-Feb-04	37	1250	1220	1220	1220	1220	1220				21	43
37	25-Feb-04	38	1250	1220	1260	1210	1220	1190	6.994	2.185	4.67E-03	21	33
38	26-Feb-04	39	1250	1225	1240	1210	1220	1230				21	34
39	27-Feb-04	40	1250	1223	1170	1260	1240	1220				21	31
40	28-Feb-04	41	1250	1158	1170	1140	1140	1180				21	38
41	29-Feb-04	42	1250	1190	1180	1170	1210	1200				21	38
42	1-Mar-04	43	1250	1213	1200	1210	1240	1200				21	38
43	2-Mar-04	44	1250	1230	1230	1230	1220	1240				21	50
44	3-Mar-04	45	1250	1203	1190	1200	1210	1210				21	47
45	4-Mar-04	46	1250	1180	1170	1160	1190	1200	0.8628	1.713	6.25E-03	21	48
46	5-Mar-04	47	1250	1215	1210	1240	1190	1220				21	48
47	6-Mar-04	48	1250	1215	1230	1170	1200	1260				21	56
		Mean	**1253**		**1230**				**2.541**	**2.015**	**4.32E-03**	**23.0**	**42.4**
		S.D.	**8**		**34**				**2.08**	**0.19**	**0.00**	**1.3**	**5.0**

Chamber Monitoring Results
Cumulative Exposure Record
Group 3 - 4000 ppm

Day	Date	Exposure Number	Nominal (ppm)	Analytical Chamber Concentration					Particle Size Determinations			Chamber Environment	
				Mean (ppm)	Individual (ppm)				MMAD (µm)	GSD	TMC (mg/m^3)	Mean Temperature (°C)	Mean Humidity (%)
0	19-Jan-04	1	3760	4093	4220	4080	4040	4030				24	44
1	20-Jan-04	2	3760	4065	4080	4080	4090	4010				24	43
2	21-Jan-04	3	3760	4050	3990	4080	4030	4100				24	42
3	22-Jan-04	4	3760	4073	4020	4040	4120	4110	2.779	1.992	1.60E-02	24	44
4	23-Jan-04	5	3760	3990	4080	4040	3850	3990				24	39
5	24-Jan-04	6	3760	4040	4040	4010	4080	4030				24	43
6	25-Jan-04	7	3760	4073	4100	4000	4110	4080				24	39
7	26-Jan-04	8	3760	3963	3940	3920	4030	3960				24	40
8	27-Jan-04	9	3760	4070	4110	4130	3970	4070				24	45
9	28-Jan-04	10	3760	4163	4250	4170	4090	4140				24	46
10	29-Jan-04	11	3760	3958	4250	3870	3890	3820	3.185	1.780	7.94E-03	24	40
11	30-Jan-04	12	3760	3895	3990	3890	3840	3860				24	40
12	31-Jan-04	13	3760	4025	4000	4060	4070	3970				24	41
13	1-Feb-04	14	3760	3890	3820	3920	3920	3900				24	44
14	2-Feb-04	15	3760	3978	4180	3850	3910	3970				24	44
15	3-Feb-04	16	3760	3770	3750	3740	3840	3750				24	46
16	4-Feb-04	17	3760	4153	4130	4140	4210	4130				24	49
17	5-Feb-04	18	3760	4285	4360	4330	4250	4200	2.399	2.235	3.08E-03	24	46
18	6-Feb-04	19	3760	3993	4000	4010	3990	3970				24	52
19	7-Feb-04	20	3760	4148	4230	4160	4120	4080				24	51
20	8-Feb-04	21	3760	4193	4250	4220	4120	4180				24	41
21	9-Feb-04	22	3760	3988	4000	3940	3970	4040				23	43
22	10-Feb-04	23	3760	3808	3820	3800	3850	3760				24	50
23	11-Feb-04	24	3760	3805	3800	3800	3730	3890				24	45
24	12-Feb-04	25	3800	3670	3620	3570	3690	3800	1.148	1.922	1.45E-03	23	45
25	13-Feb-04	26	3890	3858	3810	3840	3880	3900				23	47
26	14-Feb-04	27	3940	4023	4090	3950	4010	4040				24	43

Chamber Monitoring Results
Cumulative Exposure Record
Group 3 - 4000 ppm

Day	Date	Exposure Number	Nominal (ppm)	Analytical Chamber Concentration					Particle Size Determinations			Chamber Environment	
				Mean (ppm)	Individual (ppm)				MMAD (µm)	GSD	TMC (mg/m^3)	Mean Temperature (°C)	Mean Humidity (%)
27	15-Feb-04	28	3940	4025	4110	3960	4090	3940				24	39
28	16-Feb-04	29	3940	4040	4010	4010	4070	4070				24	38
29	17-Feb-04	30	3940	4040	4020	4050	4100	3990				23	37
30	18-Feb-04	31	3940	3960	4010	4050	3740	4040				22	37
31	19-Feb-04	32	3940	3993	3960	4040	3980	3990	3.075	1.733	2.05E-02	22	38
32	20-Feb-04	33	3940	3973	4100	3930	3880	3980				22	41
33	21-Feb-04	34	3940	4053	4130	4150	4070	3860				22	48
34	22-Feb-04	35	3940	4003	4060	3940	4070	3940				22	38
35	23-Feb-04	36	3940	3683	3750	3630	3770	3580				22	37
36	24-Feb-04	37	4140	3728	3600	3450	3950	3910				21	42
37	25-Feb-04	38	4300	4113	4250	4080	4100	4020	11.78	2.221	1.08E-02	21	33
		Mean	**3836**		**3990**				**4.061**	**1.981**	**9.96E-03**	**23.4**	**42.6**
		S.D.	**123**		**156**				**3.85**	**0.21**	**0.01**	**0.9**	**4.3**

Chamber Monitoring Results
Cumulative Exposure Record
Group 4 - 12000 ppm

Day	Date	Exposure Number	Nominal (ppm)	Analytical Chamber Concentration					Particle Size Determinations			Chamber Environment	
				Mean (ppm)	Individual (ppm)				MMAD (µm)	GSD	TMC (mg/m^3)	Mean Temperature (°C)	Mean Humidity (%)
0	19-Jan-04	1	13600	11450	11400	11500	11400	11500				24	41
1	20-Jan-04	2	13600	11130	11400	10900	11000	11200				24	41
2	21-Jan-04	3	13700	11780	11900	11900	11500	11800				24	41
3	22-Jan-04	4	13800	11650	12000	11500	11500	11600	2.881	1.842	3.17E-02	24	44
4	23-Jan-04	5	13900	11980	12000	12000	11900	12000				24	39
5	24-Jan-04	6	13900	12000	12100	12100	12000	11800				24	42
6	25-Jan-04	7	12600	13080	14600[a]	12600	12600	12500				24	39
7	26-Jan-04	8	12100	12200	12200	12200	12200	12200				24	39
8	27-Jan-04	9	12100	12300	12400	12200	12400	12200				24	44
9	28-Jan-04	10	12100	12430	12500	12400	12400	12400				24	45
10	29-Jan-04	11	12100	12400	12400	12400	12400	12400	3.357	1.729	1.13E-02	24	39
11	30-Jan-04	12	12100	12430	12500	12300	12400	12500				24	40
12	31-Jan-04	13	12100	12300	12200	12300	12300	12400				24	40
13	1-Feb-04	14	12100	12230	12200	12200	12300	12200				24	42
14	2-Feb-04	15	12100	12280	12600	12200	12300	12000				24	43
15	3-Feb-04	16	12100	12280	12300	12200	12200	12400				24	46
16	4-Feb-04	17	12100	12980	12700	13100	13100	13000				24	47
17	5-Feb-04	18	12000	13180	13200	13200	13300	13000	2.897	2.553	3.72E-03	23	46
18	6-Feb-04	19	11900	12100	12100	12200	12100	12000				24	50
19	7-Feb-04	20	11900	12100	12100	12100	12100	12100				24	50
20	8-Feb-04	21	11900	12130	12200	12100	12000	12200				24	39
21	9-Feb-04	22	11900	12080	12000	12100	12100	12100				23	44
22	10-Feb-04	23	11900	12180	12200	12200	12100	12200				24	59
23	11-Feb-04	24	11900	12100	12200	12200	12000	12000				24	44
24	12-Feb-04	25	11900	12150	12100	12100	12200	12200	5.577	2.751	4.38E-03	23	44
25	13-Feb-04	26	11900	12200	12200	12200	12200	12200				23	45
26	14-Feb-04	27	11900	12080	12200	12000	12000	12100				24	43

[a]Extrapolated value

Chamber Monitoring Results
Cumulative Exposure Record
Group 4 - 12000 ppm

Day	Date	Exposure Number	Nominal (ppm)	Analytical Chamber Concentration					Particle Size Determinations			Chamber Environment	
				Mean (ppm)	Individual (ppm)				MMAD (µm)	GSD	TMC (mg/m^3)	Mean Temperature (°C)	Mean Humidity (%)
27	15-Feb-04	28	11900	12280	12400	12200	12200	12300				24	38
28	16-Feb-04	29	11900	12450	12600	12400	12400	12400				24	37
29	17-Feb-04	30	11900	12230	12200	12200	12200	12300				23	36
30	18-Feb-04	31	11900	12080	12000	12100	12100	12100				22	36
31	19-Feb-04	32	11900	12130	11900	12100	12300	12200	3.585	1.792	2.74E-02	22	36
32	20-Feb-04	33	11900	12150	12300	12200	12000	12100				22	39
33	21-Feb-04	34	11900	12130	12300	12200	12400	11600				22	45
34	22-Feb-04	35	11900	12080	12000	12000	12000	12300				22	35
35	23-Feb-04	36	11900	12030	11600	12200	12100	12200				22	35
36	24-Feb-04	37	11900	11800	11900	11700	11800	11800				22	41
37	25-Feb-04	38	11900	11950	11800	11800	12100	12100	21.06	2.452	1.62E-02	21	32
		Mean	**12266**		**12168**				**6.560**	**2.187**	**1.58E-02**	**23.4**	**41.7**
		S.D.	**667**		**415**				**7.17**	**0.45**	**0.01**	**0.9**	**5.0**

Exposures Summary						
	Nominal by gas flow (ppm)					
Date	Group 2	Group 3	Group 4	Total Nominal by gas flow (ppm)	Total Nominal by weight (ppm)	N(gf):N(wt)
19-Jan-04	1290	3760	13600	18650	19990	0.93
20-Jan-04	1270	3760	13600	18630	19900	0.94
21-Jan-04	1270	3760	13700	18730	19900	0.94
22-Jan-04	1270	3760	13800	18830	18400	1.02
23-Jan-04	1270	3760	13900	18930	21300	0.89
24-Jan-04	1270	3760	13900	18930	21300	0.89
25-Jan-04	1260	3760	12600	17620	18400	0.96
26-Jan-04	1240	3760	12100	17100	18400	0.93
27-Jan-04	1250	3760	12100	17110	18400	0.93
28-Jan-04	1250	3760	12100	17110	18400	0.93
29-Jan-04	1250	3760	12100	17110	18400	0.93
30-Jan-04	1250	3760	12100	17110	18400	0.93
31-Jan-04	1250	3760	12100	17110	19900	0.86
1-Feb-04	1250	3760	12100	17110	17000	1.01
2-Feb-04	1250	3760	12100	17110	18400	0.93
3-Feb-04	1250	3760	12100	17110	18400	0.93
4-Feb-04	1250	3760	12100	17110	18400	0.93
5-Feb-04	1250	3760	12000	17010	18400	0.92
6-Feb-04	1250	3760	11900	16910	17000	0.99
7-Feb-04	1250	3760	11900	16910	18400	0.92
8-Feb-04	1250	3760	11900	16910	18400	0.92
9-Feb-04	1250	3760	11900	16910	19900	0.85
10-Feb-04	1250	3760	11900	16910	18400	0.92
11-Feb-04	1250	3760	11900	16910	18400	0.92
12-Feb-04	1250	3800	11900	16950	18400	0.92
13-Feb-04	1250	3890	11900	17040	18400	0.93
14-Feb-04	1250	3940	11900	17090	18400	0.93
15-Feb-04	1250	3940	11900	17090	21300	0.80
16-Feb-04	1250	3940	11900	17090	18400	0.93

Exposures Summary						
	Nominal by gas flow (ppm)					
Date	Group 2	Group 3	Group 4	Total Nominal by gas flow (ppm)	Total Nominal by weight (ppm)	N(gf):N(wt)
17-Feb-04	1250	3940	11900	17090	18400	0.93
18-Feb-04	1250	3940	11900	17090	18400	0.93
19-Feb-04	1250	3940	11900	17090	17000	1.01
20-Feb-04	1250	3940	11900	17090	18400	0.93
21-Feb-04	1250	3940	11900	17090	17000	1.01
22-Feb-04	1250	3940	11900	17090	18400	0.93
23-Feb-04	1250	3940	11900	17090	17000	1.01
24-Feb-04	1250	4140	11900	17290	17000	1.02
25-Feb-04	1250	4300	11900	17450	21300	0.82
26-Feb-04	1250	0	0	1250	1490	0.84
27-Feb-04	1250	0	0	1250	1490	0.84
28-Feb-04	1250	0	0	1250	1490	0.84
29-Feb-04	1250	0	0	1250	1490	0.84
1-Mar-04	1250	0	0	1250	1490	0.84
2-Mar-04	1250	0	0	1250	1490	0.84
3-Mar-04	1250	0	0	1250	1490	0.84
4-Mar-04	1250	0	0	1250	1490	0.84
5-Mar-04	1250	0	0	1250	1490	0.84
6-Mar-04	1250	0	0	1250	1490	0.84
					Mean:	0.91

	Inhalation Report	Appendix II

Table III
Equipment List

Exposure Chamber
1000 Liter glass and stainless steel chamber (Wahmann).

Compound Reservoir
Propane Cylinder (MG Industries).

Flowmeters
Dwyer®, size 0-40 Lpm (Dwyer® Instruments).
Top Trak™ Mass Flow Meter, Model 821-1, size 0-1 and 0-10 Lpm (Sierra Instruments) calibrated prestudy with a Gilibrator®Bubble Generator, S/N 569-S.

Pressure/Vacuum Gauges
Union Carbide vacuum gauge, Model SG6310.
MG Industries backpressure gauges, P/N 10201 and 10206.

Chamber Air Flow
Dwyer® Magnehelic® gauge (Dwyer® Instruments Inc.), calibrated prestudy with a Dry Gas Meter, Model 2M, (Singer).

Chamber Static Pressure
Dwyer® Magnehelic® gauge (Dwyer® Instruments Inc.), calibrated prestudy with Dwyer® Mark II Manometer, Model 25 (Dwyer® Instruments, Inc.).

Regulators
MG Industries Series 300.

Metering Valve
Metering Valve, Model 316 (Whitey®).

Vacuum Pumps
Thomas Industries Inc., Model 707CM50.
Closed-loop pump.

Tubing
Clear plastic, sizes 1/4", 1/2" (Norton, Baxter).
Plastic, size 1/8" (Tygon).
½" stainless steel.
Stainless steel cross.
Teflon®, size ¼ ".
Plastic "T".

	Inhalation Report	Appendix II

Table III
Equipment List

Air Analyzer
MIRAN® 1A-CVF Ambient Air Analyzer (Wilks) with a Cole Parmer Strip Chart Recorder, Model 201, and a Micronta® LCD Benchtop Digital Multimeter, Model No. 22-195
Balston® Microfibre™ Disposable Filter Unit Grade DQ.
Syringe, size 0 - 10 mL (Precision).
Syringe, size 0 - 100 mL, Gas-tight Model No. 1100 (Hamilton).

Particle Sizer
TSI Aerodynamic Particle Sizer, Model 331001, and a DELL computer, Model 486P/25, equipped with an Epson LQ-5707 printer, Model P630B.

Environmental Monitoring
Temperature and Humidity Gauge (VWR), tested prestudy with a Big Digit Traceable Hygrometer/Thermometer.
Digital Sound Meter 840029 (SPER Scientific)
Photo Meter 1, light meter (Quantum Instruments).
Oxygen/Gas Analyzer, Model 1214S (Gastech)

Balance
Pelouze, No. 4040

	Inhalation Report	Appendix II

Table IV
Chamber Distribution Records

Group (target)	Date	Port	IR Conc (ppm)	Ratio to H-1
2 (1200 ppm)	13 January 2004	H-1	1230	1.00
		H-2	1220	0.99
		H-8	1260	1.02
		H-1	1210	1.00
		H-7	1330	1.10
		H-1	1200	1.00
		H-7	1230	1.03
	14 January 2004	H-1	1230	1.00
		H-12	1310	1.07
		H-11	1250	1.02
		H-1	1250	1.00
		H-14	1270	1.02
		H-13	1230	0.98
3 (4000 ppm)	13 January 2004	H-1	3990	1.00
		H-2	3980	1.00
		H-8	3990	1.00
		H-1	3920	1.00
		H-7	4010	1.02
	14 January 2004	H-1	4020	1.00
		H-12	4200	1.04
		H-11	4150	1.03
		H-1	4060	1.00
		H-14	3800	0.94
		H-13	3940	0.97
4 (12000 ppm)	13 January 2004	H-1	12000	1.00
		H-2	11900	0.99
		H-8	12900	1.08
		H-1	12100	1.00
		H-7	13200	1.09
	14 January 2004	H-1	12200	1.00
		H-12	13300	1.09
		H-11	13000	1.07
		H-1	12200	1.00
		H-14	13000	1.07
		H-13	13000	1.07

	Inhalation Report	Appendix II

Table V
Miran Calibration

Methodology for Propane

Settings: The instrument settings for the Miran 2225 Unit are summarized below:

wavelength, microns	10.9
pathlength, dial setting	12.25
slit width, mm	1
range, absorbance	1A
response, seconds	40
gain	High
chart speed, cm/min	1
chart volts	1

Calibrations: The Miran® was turned on and allowed to warm up for approximately 10 minutes. The cell was flushed with room air for approximately one minute. The loop was closed, the unit was zeroed and the calibration series was performed as shown below. The resultant data were plotted to obtain a calibration curve. Each observer used a separate syringe for calibration.

Injection Volume (µL)	Calculated Concentration[1] (ppm)	Absorbance		
		Operator 1 (volts)	Operator 2 (volts)	Average (volts)
5000	887	0.0633	0.0622	0.0628
7000	1241	0.0861	0.0866	0.0864
23000	4078	0.2684/0.2633[a]	0.2394/0.2692[a]	0.2601
68000	12057	0.705	0.702	0.704
81000	14362	0.822	0.818	0.820

[1]Calculated Conc. (ppm) = $\frac{\text{Injection volume (µL)}}{\text{5.64 L (Volume of Miran cell)}}$

[a]Each operator injected this volume a second time to confirm the original results. All four values were used in regression.

	Inhalation Report	Appendix II

Table V
Miran Calibration

Calibration Checks: A three-point calibration check of the Miran® was performed for each exposure prior to sampling the chambers. The parameters are shown below:

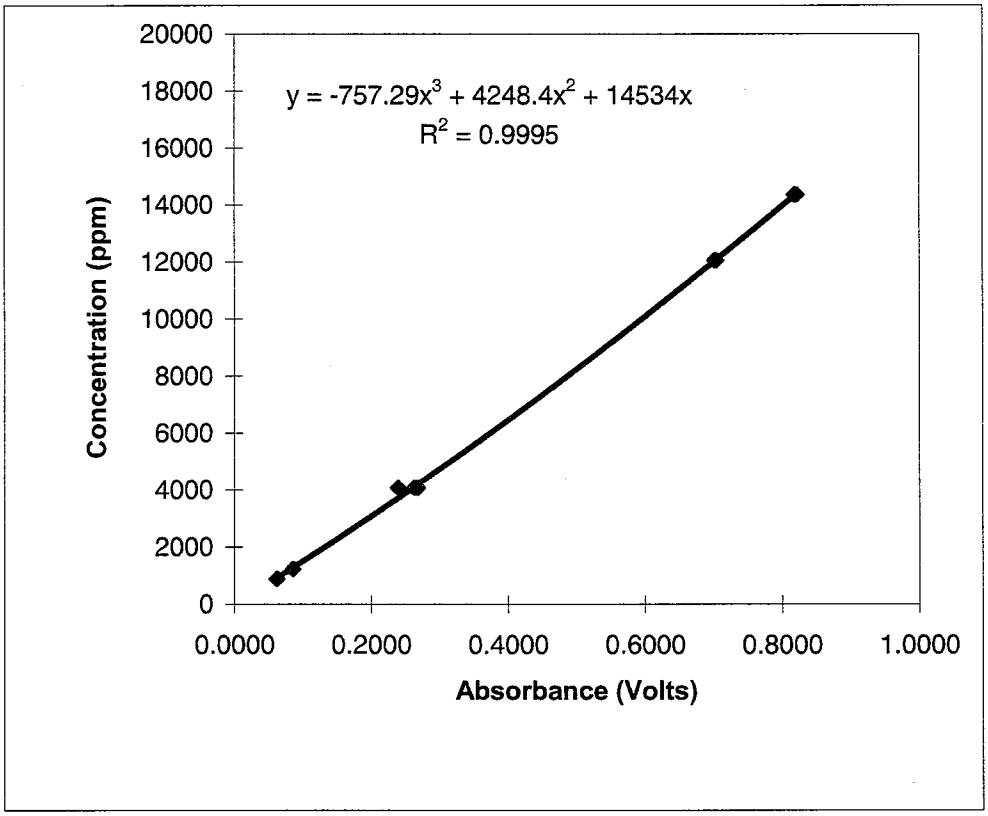
Injection Volume (µL)	Calculated Concentration (ppm)	Expected Absorbance Reading (volts)	Acceptable Absorbance Range (volts)
7000	1241	0.0864	0.0734 – 0.0994
23000	4078	0.2600	0.2211 – 0.2991
68000	12057	0.704	0.598 – 0.810

The absorbance was recorded after each injection. The absorbance was considered satisfactory if it was within 15% of the original calibration series. If any of the absorbance values fell outside the 15% range, the injection was rechecked as follows. The volume for the value that was out of range was reinjected twice. The closer pair of the three injections were averaged and the results were compared to the original curve. If the average of the pair was within the 15% range, the original was accepted. If the value of the average was outside the 15% range, the Study Director decided if a new graph was to be prepared.

	Inhalation Report	Appendix II

Table V
Miran Calibration

Calibration Curve for Propane
(Groups 1 – 4)



		Appendix II

Table VI
Testing Room and Chambers Environmental Monitoring

Interval	Location	Test Substance (ppm)[a]	Light (Ft Candles)	Noise (dB)	Oxygen (%)	Particle Sizing (mg/m^3)[b]
Pretest	Room 811 - Front	0	35.7	67.0	NM	NM
	Room 811 - Back	0	35.4	63.7	NM	NM
	Group 1	0	NM	NM	21	1.79×10^{-3}
	Group 2	1186	NM	NM	21	1.64×10^{-3}
	Group 3	3930	NM	NM	21	2.94×10^{-3}
	Group 4	11370	NM	NM	21	3.44×10^{-3}
Week 1	Room 811 – Front	0	34.1	66.9	NM	
	Room 811 – Back	0	35.1	63.0	NM	
	Group 1	0	NM	NM	21	
	Group 2	1250	NM	NM	21	
	Group 3	4073	NM	NM	21	
	Group 4	11650	NM	NM	21	
Week 3	Room 811 – Front	0	36.8	67.5	NM	
	Room 811 – Back	0	36.3	63.5	NM	
	Group 1	0	NM	NM	21	
	Group 2	1260	NM	NM	21	
	Group 3	4285	NM	NM	21	
	Group 4	13180	NM	NM	21	
Week 6	Room 811 – Front	0	34.2	65.7	NM	
	Room 811 – Back	0	34.9	63.6	NM	
	Group 1	0	NM	NM	21	
	Group 2	1220	NM	NM	21	
	Group 3	4113	NM	NM	21	
	Group 4	11950	NM	NM	21	

NM = Not Measured

[a]Values presented are the daily average for the chamber samples and a single time point for the room air samples.

[b]Pretest results presented. For on-test results, see CMR (Table II).

STUDY TITLE

Analytical Report For:

Propane:
Combined Repeated-Exposure Toxicity, Reproduction and Neurotoxicity Screening in Rats via Whole-Body Inhalation Exposures

AUTHOR

[redacted]

REPORT DATE

9 April 2010

STUDY NUMBER

03-4245

SIGNATURES

Written by: [redacted]
Formulation Chemistry Services
07 Apr 10
Date

Reviewed by: [redacted]
Formulation Chemistry Services
9 Apr 10
Date

Approved by: [redacted]
Analytical Services
07 April 10
Date

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II. A Typical Gas Chromatogram of Propane Test Substance 7

1. Summary

The test substance and the analytical standard (Propane) were analyzed ("pre-study" and "post-study") to determine the purity and stability of the test substance by comparison to the analytical standard. The analytical method was validated at Huntingdon Life Sciences (HLS). The analytical method involved gas bag sampling of the test substance and the analytical standard and quantification using Gas Chromatography with Flame Ionization Detection (FID).

2. Experimental Procedures

The analytical method (HLS-011-03 and it's subsequent revisions) was validated by Formulation Chemistry at HLS. Details of the analytical method and the validation are maintained in this study file.

Gas bag sampling of the test substance and the analytical standard was performed in the Inhalation Department at HLS. The test substance and the analytical standard were analyzed using a Gas Chromatograph equipped with a HP Plot Q (30 m x 0.32 mm, 20 µm) column and Flame Ionization Detector (FID) to determine the purity of Propane test substance. HP 3396A integrator was used for data collection and Excel was used for processing the data.

Date of sample analysis is listed as follows:

Interval	Date Analyzed
"Pre-Study" Characterization	29 May 03
"Post-Study" Characterization	19 Mar 04

3. Results and Discussion

The test substance and analytical standard (Propane) were analyzed prior to the initiation of the study and after the completion of the study to determine the purity and stability of the test substance. The results of the characterization are presented in Table I. A typical chromatogram of Propane standard is presented in Figure I. A typical chromatogram of Propane test substance is presented in Figure II.

Table I: Propane Characterization ("Pre-Study")

Sample ID	Area % of Ethane	Area % of Isobutane	Area % of Butane	Area % of other Impurities	Area % of Propane Standard	Mean Area % of Propane Standard
Propane Standard	0.08	0.00	0.00	0.09	99.83	99.84
Propane Standard	0.08	0.00	0.00	0.10	99.82	
Propane Standard	0.08	0.00	0.00	0.05	99.87	

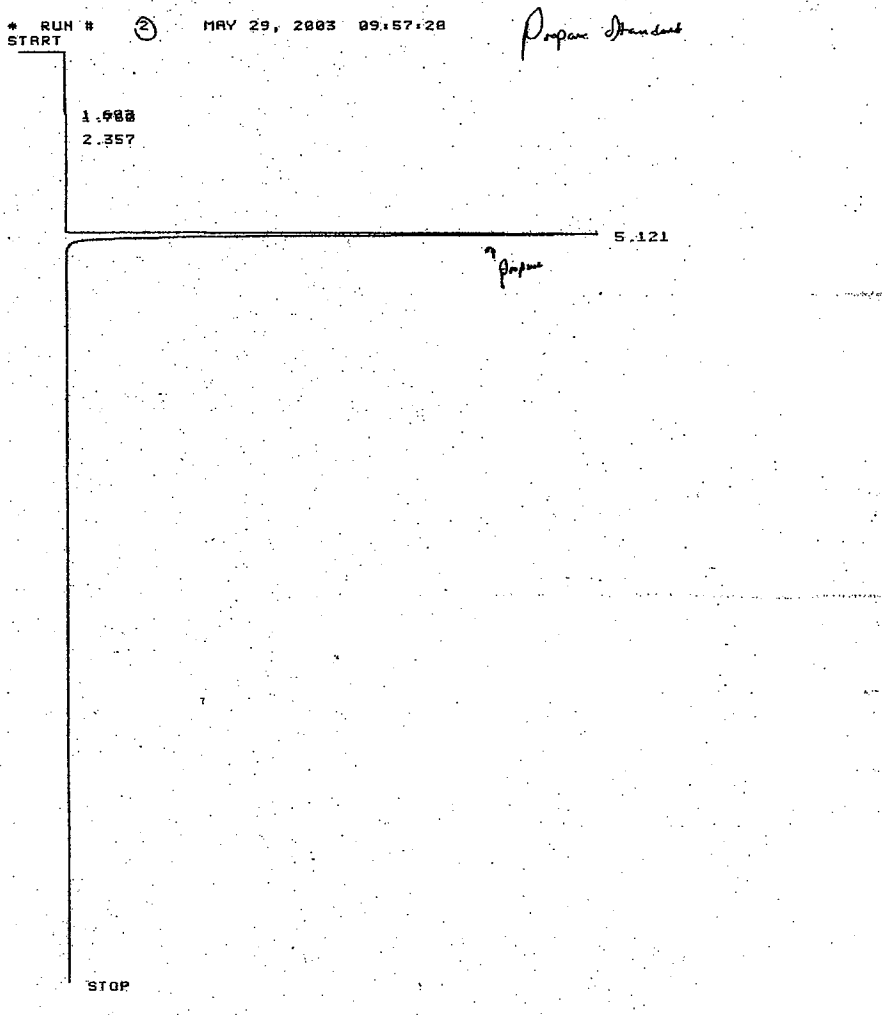
Sample ID	Area % of Ethane	Area % of Isobutane	Area % of Butane	Area % Other Impurities	Area % of Propane Substance	Mean Area % of Propane Test Substance
Propane Test Substance	0.00	0.00	0.00	0.12	99.88	99.91
Propane Test Substance	0.00	0.00	0.00	0.08	99.92	
Propane Test Substance	0.00	0.00	0.00	0.08	99.92	

Table II: Propane Characterization ("Post-Study")

Sample ID	Area % of Ethane	Area % of Isobutane	Area % of Butane	Area % of other Impurities	Area % of Propane Standard	Mean Area % of Propane Standard
Propane Standard	0.08	0.00	0.00	0.12	99.80	99.80
Propane Standard	0.08	0.00	0.00	0.12	99.80	
Propane Standard	0.08	0.00	0.00	0.13	99.79	

Sample ID	Area % of Ethane	Area % of Isobutane	Area % of Butane	Area % Other Impurities	Area % of Propane Substance	Mean Area % of Propane Test Substance
Propane Test Substance	0.00	0.00	0.00	0.09	99.91	99.90
Propane Test Substance	0.00	0.00	0.00	0.10	99.90	
Propane Test Substance	0.00	0.00	0.00	0.10	99.90	

Figure I. A Typical Gas Chromatogram of Propane Analytical Standard



RUN# 2 MAY 29, 2003 09:57:20

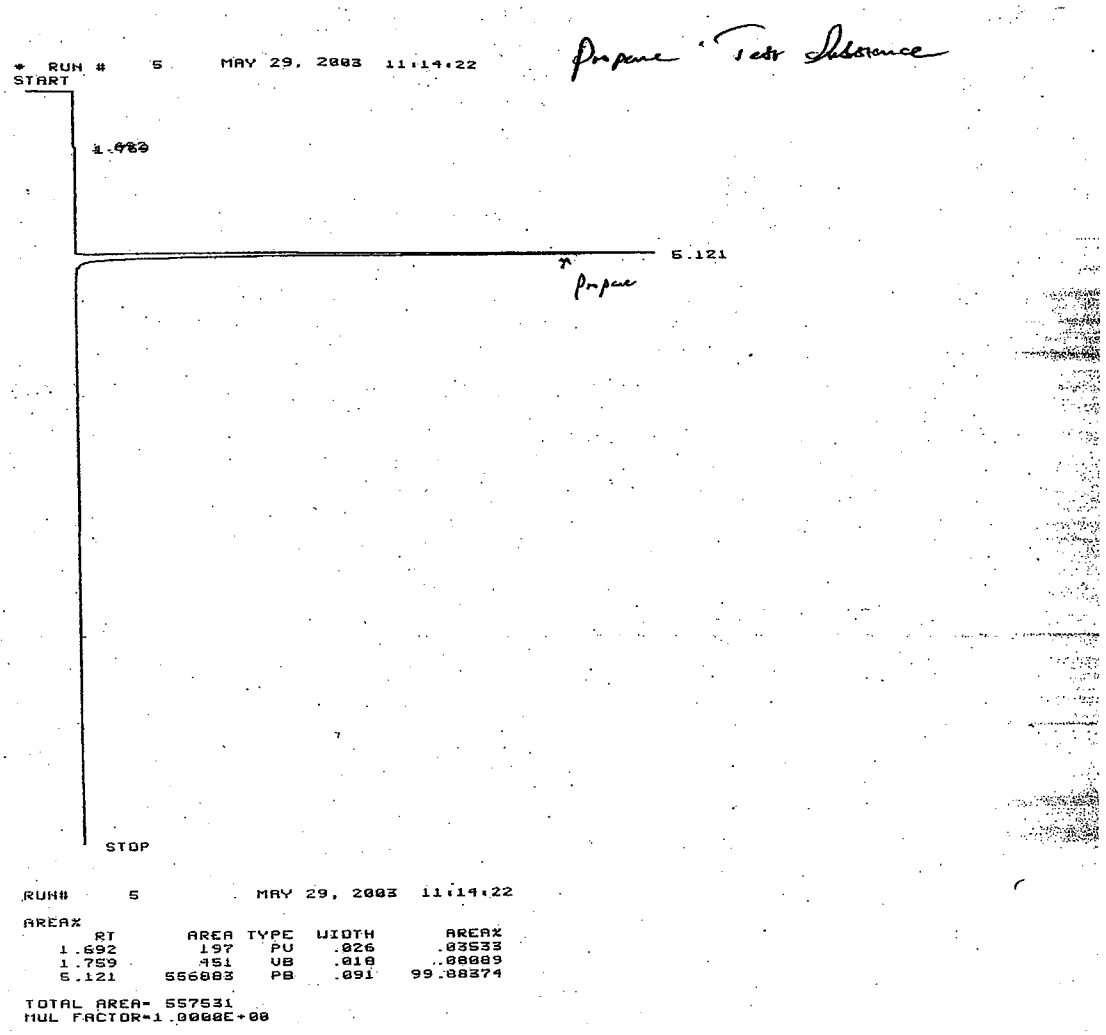
AREAX

RT	AREA	TYPE	WIDTH	AREAX
1.693	219	BV	.027	.04038
1.760	325	VV	.019	.05992
2.357	410	BB	.020	.07559
5.121	541424	PB	.091	99.82410

TOTAL AREA= 542378

Response (mV) vs Time (minutes)

Figure II. A Typical Gas Chromatogram of Propane Test Substance



Response (mV) vs Time (minutes)

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This is an abridged version of text and tables from Study No. H-34, 00-14500 as amended on 24 November 2008.

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	Neurobehavioral Positive Control Data: Functional Observational Battery	Appendix KK

1. INTRODUCTION

This study was designed to train technicians to perform the functional observational battery evaluations for rats and to provide evidence, by use of test materials with known neurological effects, that the observational methods used at Huntingdon Life Sciences, Princeton Research Center, are capable of detecting major neurotoxic endpoints. In addition, these studies were used to demonstrate interobserver reliability for neurobehavioral assessments by evaluating consistency of observations performed by different technicians.

2. MATERIALS AND METHODS

2.1. REGULATORY REFERENCES

2.1.1. TEST GUIDELINES

This study was designed to provide positive control data for neurotoxicity screening studies in accord with the US EPA Health Effects Test Guidelines, OPPTS 870.6200 Neurotoxicity Screening Battery, August 1998.

2.1.2. GOOD LABORATORY PRACTICES

This study was conducted in compliance with Part 160 of 40 CFR (EPA/FIFRA Good Laboratory Practice Standards) with the exception that assays to verify concentration, stability and homogeneity of the test articles in carriers were not performed.

2.1.3. ANIMAL WELFARE ACT COMPLIANCE

This study complied with all appropriate parts of the Animal Welfare Act regulations: 9 CFR Parts 1 and 2 Final Rules, Federal Register, Volume 54, No. 168, August 31, 1989, pp. 36112-36163 effective October 30, 1989 and 9 CFR Part 3 Animal Welfare Standards; Final Rule, Federal Register, Volume 56, No. 32, February 15, 1991, pp. 6426-6505 effective March 18, 1991.

2.1.4. FACILITIES MANAGEMENT/ANIMAL HUSBANDRY

Currently acceptable practices of good animal husbandry were followed e.g., *Guide for the Care and Use of Laboratory Animals*; National Academy Press, 1996. Huntingdon Life Sciences, East Millstone, New Jersey is fully accredited by the Association for Assessment and Accreditation of Laboratory Animal Care International (AAALAC).

	Neurobehavioral Positive Control Data: Functional Observational Battery	Appendix KK

2.2. STUDY MANAGEMENT

2.2.1. SPONSOR

Huntingdon Life Sciences
P.O. Box 2360
Mettlers Road
East Millstone, New Jersey 08875-2360

2.2.2. TESTING FACILITY

Huntingdon Life Sciences
P.O. Box 2360
Mettlers Road
East Millstone, New Jersey 08875-2360

2.2.3. STUDY DIRECTOR

[redacted]

2.3. EXPERIMENTAL DESIGN

2.3.1. TRAINING SESSIONS

Training consisted of two parts. In the first part, the technicians were required to view a training video for a functional observational battery (United States Environmental Protection Agency/American Industrial Health Council Training Video and Reference Manual for an FOB, 1996). The second part consisted of observations of animals treated with chemicals known to produce neurological effects as indicated below:

Group	Route of Admin.	Test Article	Daily Doses[a]			Number of Animals			
						Initial		Functional Observational Battery	
			Dose (mg/kg)	Volume (mL/kg)	Conc. (mg/mL)	M	F	M	F
1[b]	i.p.	Control	-	5	-	3	-	3	-
2	i.p.	Chlorpromazine	4	5	0.8	3	-	3	-
3	i.p.	Amphetamine	2	5	0.4	3	-	3	-
4	i.p.	Amphetamine	8	5	1.6	-	3	-	3
5	i.p.	Physostigmine	1	5	0.2	-	3	-	3
6	Oral	Ethanol	3000	10	300	-	3	-	3

[a]Represent doses of test article as supplied; i.e., no correction for percent active ingredient was made.
[b]Control animals received 0.9% saline.
M = Male; F = Female; i.p. = intraperitoneal; Oral, via gastric intubation;
mg/kg = milligrams of test article per kilogram of body weight

	Neurobehavioral Positive Control Data: Functional Observational Battery	Appendix KK

2.3.2. FOB PERFORMANCE EVALUATIONS

After completion of the training session, each technician was required to perform a functional observational battery evaluation in which the technician was blinded as to the treatment group. Each technician evaluated 20 males or 20 females (5 animals/group).

Group	Route of Admin.	Test Article	Daily Doses[a]			Number of Animals			
						Initial		Functional Observational Battery	
			Dose (mg/kg)	Volume (mL/kg)	Conc. (mg/mL)	M	F	M	F
1[b]	i.p.	Control	-	5	-	5	5	5	5
2	i.p.	Chlorpromazine	4	5	0.8	5	5	5	5
3	i.p.	Amphetamine	2	5	0.4	5	5	5	5
4	s.c.[c]	Physostigmine	1	5	0.2	5	5	5	5

[a]Represent doses of test article as supplied; i.e., no correction for percent active ingredient was made.
[b]Control animals received 0.9% saline.
[c]Intraperitoneal injections were administered for the Training Sessions and for the Performance Evaluations conducted by Observer 8; subcutaneous injections were administered for the Performance Evaluations conducted by all other observers.

M = Male; F = Female; i.p. = intraperitoneal; s.c. = subcutaneous injection
mg/kg = milligrams of test article per kilogram of body weight

2.4. STUDY DATES

2.4.1. STUDY INITIATION

15 February 2000 (Date Study Director signed the Protocol)

2.4.2. DATE OF ANIMAL RECEIPT

3 March 2000

2.4.3. DOSING INITIATION

Training Session: 23 March 2000 (Experimental Start Date)
Performance Evaluations: 26 April 2000

2.4.4. DOSING TERMINATION

6 July 2000

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2.4.5. EXPERIMENTAL TERMINATION

1 August 2001

2.4.6. STUDY COMPLETION

1 August 2003 (Date Study Director signed the Final Report)

2.5. TEST ARTICLES

2.5.1. CHLORPROMAZINE

Manufacturer

Sigma Chemical Company
St. Louis, Missouri 63178

Lot Number

48H1403

Purity

98%

Description

White/white with a yellow cast powder

Date Received

1 December 1999

Expiration Date

April 2001

Storage

Room temperature, protected from light

2.5.2. D-AMPHETAMINE SULFATE

Manufacturer

Sigma Chemical Company
St. Louis, Missouri 63178

	Neurobehavioral Positive Control Data: Functional Observational Battery	Appendix KK

Lot Number

69H1239

Purity

Assume 100%

Description

Powder

Date Received

7 January 2000

Expiration Date

June 2001

Storage

Room temperature

2.5.3. PHYSOSTIGMINE

Manufacturer

Sigma Chemical Company
St. Louis, Missouri 63178

Lot Number

48H1126

Purity

Assume 100%

Description

Powder

Date Received

1 December 1999

	Neurobehavioral Positive Control Data: Functional Observational Battery	Appendix KK

Expiration Date

1 December 2004

Storage

Room temperature, protected from light

2.5.4. ETHANOL

Manufacturer

Spectrum Chemical Manufacturing Corporation
Gardena, California 90248

Lot Number

MI0504

Purity

100%

Description

Clear liquid

Date Received

16 March 1998

Expiration Date

March 2003

Storage

Room temperature

2.5.5. ANALYSIS

Documentation of the identity, strength, purity, composition and stability; and synthesis, fabrication, and/or derivation of the test articles was the responsibility of the Manufacturers.

	Neurobehavioral Positive Control Data: Functional Observational Battery	Appendix KK

2.5.6. ARCHIVAL SAMPLE

Samples from the lots of Chlorpromazine, D-Amphetamine Sulfate, Physostigmine and Ethanol are stored in the Archives of the Testing Facility under conditions specified for test article storage.

2.5.7. DISPOSITION

The unused portions of Chlorpromazine, D-Amphetamine Sulfate and Physostigmine were submitted to the Archives of the Testing Facility as archival samples. The remaining portions of Ethanol were retained by the Testing Facility for possible future use.

2.6. CONTROL ARTICLE

0.9% Saline

2.6.1. MANUFACTURER

Baxter Healthcare Corporation
Deerfield, Illinois 60015

2.6.2. LOT NUMBER

G949941

2.6.3. PURITY

100%

2.6.4. DESCRIPTION

Clear, colorless liquid

2.6.5. DATE RECEIVED

5 November 1999

2.6.6. EXPIRATION DATE

October 2000

	Neurobehavioral Positive Control Data: Functional Observational Battery	Appendix KK

2.6.7. STORAGE

Room Temperature

2.6.8. ANALYSIS

Documentation of the identity, strength, purity, composition and stability; and synthesis, fabrication, and/or derivation of the control article was the responsibility of the Manufacturer.

2.6.9. ARCHIVAL SAMPLE

A sample from each lot of control article is stored in the Archives of the Testing Facility under conditions specified for control article storage.

2.6.10. DISPOSITION

The unused portion of the control article will be retained for use in future studies. Any empty control article containers will be discarded by the Testing Facility following completion of the study.

2.7. TEST ANIMALS

2.7.1. SPECIES

Albino Rats (Outbred) VAF/Plus®
CD® (Sprague-Dawley derived) [Crl:CD® (SD)IGS BR]

2.7.2. SUPPLIER

Charles River Laboratories
Kingston, New York 12484

2.7.3. JUSTIFICATION FOR ANIMAL SELECTION

The rat is the animal model recommended by the testing guidelines for use in neurotoxicity screening studies. In addition, a historical database is available for comparative evaluation.

	Neurobehavioral Positive Control Data: Functional Observational Battery	Appendix KK

2.7.4. NUMBER OF ANIMALS

Transferred from the In-house Colony:
60 total (30 males, 30 females)

Placed on test:
40 total (20 males, 20 females)

Females were nulliparous and non-pregnant.

2.7.5. JUSTIFICATION FOR NUMBER OF ANIMALS

The neurotoxicants used in this study were chosen because they produce transient neurological effects and do not cause permanent damage to the nervous system at the doses used in this study. Therefore, the animals were used more than once during the training program. During the training portion of the study, a total of 18 animals (3 males or 3 females/chemical) were used. This was considered the minimum number necessary to demonstrate the range of effects of the chemical based on individual animal variability. During the performance part of the study, a total of 20 males and 20 females were used (including animals used in the training portion of the study). This allowed each technician undergoing training to perform the FOB evaluation for 20 animals (5 males or 5 females/group) and allowed two separate evaluations per week. Five animals per group were considered the minimum number necessary to produce scientific and statistically valid data.

2.7.6. AGE AT RECEIPT

23 days

2.7.7. AGE AT INITIATION OF TRAINING SESSION

43 days

2.7.8. AGE AT INITIATION OF PERFORMANCE EVALUATIONS

77 days

	Neurobehavioral Positive Control Data: Functional Observational Battery	Appendix KK

2.7.9. WEIGHT AT INITIATION OF TRAINING SESSION (GRAMS)

	Mean	Range
Male:	205	178 to 225
Female:	172	161 to 180

2.7.10. WEIGHT AT INITIATION OF PERFORMANCE EVALUATIONS (GRAMS)

	Mean	Range
Male:	440	379 to 498
Female:	270	235 to 339

2.7.11. ACCLIMATION PERIOD

Animals were acclimated for approximately 3 weeks. All animals were examined during the acclimation period to confirm suitability for study.

2.8. SELECTION AND GROUP ASSIGNMENT

More animals than required for the study were transferred from the in-house colony. Twenty males and twenty females were randomly selected for use on study and randomly assigned to control or treatment groups. Individual weights of animals used on study at initiation of the training session were within ±20% of the mean weight for each sex. Disposition of all animals not utilized in the study is maintained in the study file.

2.9. ANIMAL IDENTIFICATION

Each rat was identified with a metal ear tag bearing its assigned animal number. The assigned animal number plus the study number comprised the unique animal number for each animal. In addition, each cage was provided with a cage card which was color-coded for dose level identification and contained study number and animal number information.

2.10. VETERINARY CARE

Animals were monitored by the technical staff for any conditions requiring possible veterinary care.

	Neurobehavioral Positive Control Data: Functional Observational Battery	Appendix KK

2.11. HUSBANDRY

2.11.1. HOUSING

Animals were doubly housed in elevated, stainless steel, wire mesh cages during the first week of the acclimation period and individually housed thereafter.

2.11.2. FEED

Certified Rodent Diet, No. 5002; (Meal) (PMI Nutrition International, St. Louis, Missouri) was available without restriction. Fresh feed was presented weekly.

2.11.3. FEED ANALYSIS

Analysis of each feed lot used during this study was performed by the manufacturer. Results are maintained on file.

2.11.4. WATER

Water was available without restriction via an automated watering system (Elizabethtown Water Company, Westfield, New Jersey).

2.11.5. WATER ANALYSIS

Water analyses are conducted by Elizabethtown Water Company, Westfield, New Jersey (Raritan-East Millstone Plant) to ensure that water meets standards specified under the EPA Federal Safe Drinking Water Act Regulations (40 CFR Part 141). In addition, water samples are collected biannually from representative rooms in the Testing Facility; chemical and microbiological water analyses are conducted on these samples by a subcontract laboratory. Results of all water analyses are maintained on file at the Testing Facility.

2.11.6. CONTAMINANTS

There were no known contaminants in the feed or water which were expected to interfere with the results of this study.

	Neurobehavioral Positive Control Data: Functional Observational Battery	Appendix KK

2.11.7. ENVIRONMENTAL CONDITIONS

Light/Dark Cycle

A twelve hour light/dark cycle was provided and controlled via an automatic timer.

Temperature

Temperature was monitored and recorded twice daily and maintained within the specified range to the maximum extent possible. Excursions outside the specified range were not considered to have affected the integrity of the study.

Desired: 18 to 26°C
Actual: 15 to 24°C

Relative Humidity

Relative humidity was monitored and recorded once daily and maintained within the specified range to the maximum extent possible. Excursions outside the specified range were not considered to have affected the integrity of the study.

Desired: 30 to 70%
Actual: 28 to 68%

2.12. TEST ARTICLE PREPARATION

Appropriate amounts of the test articles were mixed with 0.9% saline to achieve the desired concentrations. Dosing solutions were prepared either the day prior to or the day of dose administration and were stored refrigerated when not in use.

2.13. ANALYSIS OF DOSE SOLUTIONS

Analysis of the dosing solutions was not performed for this study.

	Neurobehavioral Positive Control Data: Functional Observational Battery	Appendix KK

2.14. TEST ARTICLE ADMINISTRATION

2.14.1. ROUTE OF ADMINISTRATION

Chlorpromazine, D-Amphetamine Sulfate and saline were administered by intraperitoneal injection into the abdominal cavity near the inguinal region using a sterile needle and syringe of appropriate size. Doses were calculated using the most recent body weights available. A volume of 5 mL/kg of body weight was administered.

Physostigmine was administered by intraperitoneal injection into the abdominal cavity near the inguinal region or by subcutaneous injection into an area on the back, using a sterile needle and syringe of appropriate size. Intraperitoneal injections were administered for the Training Sessions and for the Performance Evaluations conducted by Observer 8; subcutaneous injections were administered for the Performance Evaluations conducted by all other observers. Doses were calculated using the most recent body weights available. A volume of 5 mL/kg of body weight was administered.

Ethanol was administered by oral intubation using a stainless steel dosing needle and syringe of appropriate size. Doses were calculated using the most recent body weights available. A volume of 10 mL/kg of body weight was administered.

2.14.2. ROUTE JUSTIFICATION

The intraperitoneal, subcutaneous and oral routes provide rapid test article absorption and have been used in previous studies with the test articles.

2.14.3. DOSE LEVELS

Training Sessions

4 mg Chlorpromazine/kg body weight (males)
2 mg D-Amphetamine Sulfate/kg body weight (males)
8 mg D-Amphetamine Sulfate/kg body weight (females)
1 mg Physostigmine/kg body weight (females)
3000 mg Ethanol/kg body weight (females)

	Neurobehavioral Positive Control Data: Functional Observational Battery	Appendix KK

Performance Evaluations

4 mg Chlorpromazine/kg body weight
2 mg D-Amphetamine Sulfate/kg body weight
1 mg Physostigmine/kg body weight

2.14.4. DOSE VOLUME

0.9% Saline, Chlorpromazine, D-Amphetamine Sulfate, and Physostigmine were administered at a volume of 5 mL/kg of body weight. Ethanol was administered at a volume of 10 mL/kg of body weight.

2.14.5. FREQUENCY OF DOSING

Each animal was dosed no more than once per week. There was a washout period of approximately one to five weeks between doses.

2.15. EXPERIMENTAL EVALUATIONS

2.15.1. VIABILITY CHECKS

Animals were observed in their cages once daily for mortality and signs of severe toxic or pharmacologic effects.

2.15.2. PHYSICAL/NEUROBEHAVIORAL EXAMINATIONS

Animals were removed from their cages and examined once pretest to determine suitability for study. Examinations included observations of general condition, skin and fur, eyes, nose, oral cavity, abdomen and external genitalia, occurrence of secretions and excretions, autonomic activity (e.g., lacrimation, piloerection, pupil size, unusual respiratory pattern), changes in gait or posture, response to handling, presence of clonic or tonic movements, stereotypy (e.g., excessive grooming, repetitive circling) and bizarre behavior (e.g., self-mutilation, walking backward).

2.15.3. BODY WEIGHT

Animals were removed from their cages and weighed once pretest and once prior to each dose to determine dose volumes. Body

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weights were also recorded during the study as part of the functional observational battery.

2.15.4. FUNCTIONAL OBSERVATIONAL BATTERY EVALUATIONS

Training Session

Training consisted of two parts. In the first part, all technicians were required to view a training video for a functional observational battery (United States Environmental Protection Agency/American Industrial Health Council Training Video and Reference Manual for an FOB, 1996). The second part consisted of observations of animals treated with chemicals known to produce neurological effects. Two experienced technicians performed the FOB evaluations and instructed the novice technicians, under the direction of the Study Director or other senior staff member. These evaluations were not performed "blind".

FOB Performance Evaluation

After training, the experienced and novice technicians were each required to evaluate 20 animals (5 males or females/group) using the Functional Observational Battery. Observations by each technician were performed blind, i.e., the observer was unaware of the treatment of each animal. Animals were randomized and blinded according to the standard operating procedures of the Testing Facility.

The results of each FOB evaluation were tabulated and the Study Director determined whether the observations performed by each technician comprised a treatment profile consistent with known neurological effects of each test article. Interobserver reliability was considered established for technicians that accurately identified the treatment profile for each test article. The expected neurological effects were based on published reports in the literature, a previous validation study conducted at the Testing

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Facility (Study No. 96-4516), and observations by the experienced technicians.

Technicians not accurately identifying the treatment profile for each test article were given additional training and/or conducted additional performance evaluations before being allowed to conduct FOB evaluations on a study.

In addition to being able to identify the treatment profile for each test article, each technician was required to demonstrate consistency in performing the quantitative measures of hindlimb and forelimb grip strength and landing foot splay. This was done by determining the mean and standard deviation for the control animals during the performance evaluation for each technician and calculating the coefficient of variance [(standard deviation/mean) x 100%]. The coefficient of variance was required to be approximately 25% or lower to be considered consistent. If a technician did not achieve this level of consistency, further training and evaluations were performed.

Parameters Evaluated

Temperature, humidity, noise level and illumination were measured and recorded to ensure that variations in environmental conditions were minimal during all evaluations.

Evaluations were performed according to the Testing Facility's standard operating procedures that include defined scales for each function listed below:

1. Assessment of signs of autonomic function:
   Ranking of the degree of lacrimation and salivation
   Presence or absence of piloerection and exophthalmus
   Count of urination and defecation
   Pupillary function (constriction of pupil in response to light)
   Degree of palpebral closure

2. Description, incidence, and severity of any convulsions, tremors, or abnormal motor movements

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3. Ranking of general level of activity in the open field

4. Description and incidence of posture and gait abnormalities and ranking of gait abnormalities

5. Quantitative measures of forelimb and hindlimb grip strength

6. Quantitative measure of landing foot splay

7. Ranking of reactivity to general stimuli; sensorimotor responses to visual and auditory stimuli; and the response to a tail pinch.

2.16. POSTMORTEM

At the conclusion of all evaluations, all animals were sacrificed and discarded. No necropsy was performed and no tissues were collected. Animals were euthanized by carbon dioxide inhalation.

2.17. STATISTICAL ANALYSIS

The following parameters were analyzed statistically:

body weight (from the functional observational battery)
forelimb and hindlimb grip strength measurements
landing foot splay measurements

2.17.1. METHOD OF ANALYSIS

Mean values of all dose groups were compared to the mean value for the control group at each time interval.

Evaluation of equality of group means was made by the appropriate statistical method, followed by a multiple comparison test if needed. Bartlett's test (Bartlett, 1937) was performed to determine if groups had equal variances. If the variances were equal, parametric procedures were used; if not, nonparametric procedures were used. The parametric method was the standard one-way analysis of variance (ANOVA) using the F ratio to assess significance (Armitage, 1971). If significant differences among the means were indicated, Dunnett's test (Dunnett, 1955, 1964) or

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Williams test (Williams, 1971, 1972) were used to determine which means were significantly different from the control. The nonparametric method was the Kruskal-Wallis test (Kruskal and Wallis, 1952, 1953) and if differences were indicated, Shirley's test (Shirley, 1977) or Dunn's test (Dunn, 1964) were used to determine which means differed from control. Bartlett's test for equality of variance was conducted at the 1% significance level; all other statistical tests were conducted at the 5% and 1% significance levels.

2.18. DATA STORAGE

All raw data and retained samples, as well as the original study protocol and the original final report will be maintained in the Archives of the Testing Facility upon completion of the study.

2.19. PROTOCOL DEVIATIONS

The following protocol deviations occurred during the study but were not considered to have compromised the validity or integrity of the study.

1. Viability checks were performed once per day instead of twice per day as specified in the Protocol.

2. Animals were approximately 3 weeks old at receipt instead of approximately 4 weeks old as specified in the protocol. In addition, the animals were approximately 11 weeks old at initiation of performance evaluations rather than 8 weeks or less as specified by the protocol.

3. Animals were not randomly assigned to study groups to try to equalize mean body weights as specified in the Protocol. Animals were arbitrarily assigned animal numbers and placed into groups by animal number (i.e. Nos. 5001 to 5005 were assigned to Group 1; Nos. 5006 to 5010 were assigned to Group 2; etc.).

4. Body weights of some animals exceeded the Protocol specified range of 150 to 250 grams at first dose.

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5. Initial FOB performance evaluations by Observers 1 and 6 conducted on 26 April 2000 were performed on 10 animals/sex/observer instead of 20 males or 20 females/observer as specified in the Protocol. Evaluations were re-conducted by these observers using the correct number of animals. The initial evaluations are not presented in this report, but are maintained with the study data.

6. The washout period between doses was approximately one to five weeks instead of approximately one week as specified in the Protocol.

7. Body weights for the calculation of dose volumes were not recorded weekly as specified in the Protocol, but were recorded prior to each dose.

8. Fresh dosing solutions were prepared on the day prior to or on day of dose rather than once weekly as required by protocol.

9. The acceptable variability established in the report of 25-30% differed from the range specified in the protocol of 25% or less.

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3. RESULTS AND DISCUSSION

3.1. FUNCTIONAL OBSERVATIONAL BATTERY (FOB) EVALUATIONS

Nine technicians were trained or retrained in the performance of the FOB evaluations and subsequently tested for their ability to identify the behavioral pattern produced by three test articles that are known to produce neurological effects. Three of the technicians (Observers 1, 5, and 6) had been previously trained and helped to set the standard for the expected pattern of observations for each compound. Results of a previous training study conducted at the Testing Facility (Study No. 96-4516), as well as published data, were also used to set the performance standards. Results of the FOB evaluations for each test article are presented in Table 2 for all nine observers. The standard pattern of effects for each of the test articles and the comparative evaluations for each observer are presented in the following sections for all observers, with the exception of Observer 3 who is no longer employed at the Testing Facility.

3.2. FOB EVALUATIONS FOR RATS TREATED WITH CHLORPROMAZINE

The pattern of effects observed after administration of chlorpromazine (Text Table 1) are consistent with the actions of the drug which is a central nervous system depressant. The pattern of effects is also similar to that observed in previous training studies. All observers noted postural effects in the home cage, with the animal lying on its side or flattened; effects on gait and posture in the open field, mainly body drags or limbs splayed or dragging; decreased or no locomotion; low or very low arousal level; and no response to the approach of a blunt object. Seven of the eight observers that were compared also noted effects on palpebral closure in the home cage, with eyelids slightly drooping or half-closed and moderate or extreme lacrimation. Six of the eight observers also noted no response to an auditory stimulus and some in coordination in the air righting reflex. In the functional evaluations, there was an increase in landing foot splay of

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17% to 46% for the Chlorpromazine-treated animals, as compared to the saline controls, for 7/7 observers.

Text Table 1 - FOB Evaluations for Rats Treated with Chlorpromazine

	No. of Observations							
	Males (n = 5))				Females (n = 5)			
Evaluations	**Obs. 1**	**Obs. 2**	**Obs. 4**	**Obs. 5**	**Obs. 6**	**Obs. 7**	**Obs. 8**	**Obs. 9**
Home Cage								
• Posture								
lying on Side	2	0	2	0	1	0	0	0
flattened	1	1	0	1	2	2	1	4
• Palpebral Closure								
sl. drooping	4	1	0	1	1	2	4	4
half-closed	1	0	0	1	0	0	0	0
Handling								
• Lacrimation								
moderate	4	1	2	0	1	1	2	2
extreme	0	0	0	0	3	2	1	2
Open Field								
• Gait and Posture								
body drags	1	0	2	2	1	2	3	2
limbs splayed	5	5	1	1	3	2	2	3
• Locomotion								
decreased	0	0	0	1	0	1	4	1
none	5	5	3	4	4	4	1	4
• Arousal								
low	0	0	0	0	0	2	1	1
very low	5	5	3	5	4	3	4	4
Reflex								
• Approach								
no response	3	3	2	4	3	5	2	5
• Audition								
no response	0	2	2	0	2	2	2	4
• Air Righting								
sl. uncoordinated	3	2	0	3	2	0	0	1
lands on side	1	0	1	0	0	0	0	1
Landing Foot Splay								
• % increase	35%	34%	17%	21%	46%	17%	[a]	25%

[a]Some measurements were performed incorrectly and not considered valid. The number of valid measurements was considered to be too small to provide a valid comparison.

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3.3. FOB EVALUATIONS FOR RATS TREATED WITH AMPHETAMINE

D-amphetamine, a catecholamine analog, is a central nervous system stimulant that induces increased locomotor activity, mainly through noradrenergic receptors, and/or produces stereotypic behavior via dopaminergic mechanisms. The predominant effects that are produced are dependent on both the dose of amphetamine and individual variability. The effects observed in the FOB after administration of D-amphetamine to rats are consistent with both actions of the drug. Stereotypic behavior, consisting of excessive repetitive actions such as sniffing, was noted by all eight observers and was seen in most of the animals. Increased locomotor activity and high or very high arousal state was noted by seven of eight observers, although the incidence was lower than that for stereotypic behavior. Decreased locomotor activity and low or very low arousal was also noted by some observers. This paradoxical effect was attributed to the predominance of the stereotypic effects compared to the stimulation of motor activity, which resulted in less movement and arousal in the animals.

Text Table 2 – FOB Evaluations for Rats Treated with Amphetamine

	No. of Observations							
	Males (n = 5))				Females (n = 5)			
Evaluations	**Obs. 1**	**Obs. 2**	**Obs. 4**	**Obs. 5**	**Obs. 6**	**Obs. 7**	**Obs. 8**	**Obs. 9**
Open Field								
• Locomotion								
increased	1	2	2	0	3	5	4	4
decreased	3	1	0	0	2	0	0	0
• Arousal								
high, sl. excitement	1	0	2	4	4	5	4	5
very high, hyperalert	1	1	0	0	0	0	0	0
low	1	1	0	1	1	0	0	0
very low	1	1	0	0	0	0	0	0
Stereotypic Behavior								
present	4	5	2	4	5	5	4	5
Reflex								
• Approach								
no response	1	0	3	1	4	1	0	0

	Neurobehavioral Positive Control Data: Functional Observational Battery	Appendix KK

3.4. FOB EVALUATIONS FOR RATS TREATED WITH PHYSOSTIGMINE

Physostigmine is a cholinesterase inhibitor whose administration results in an excess of the neurotransmitter acetylcholine at cholinergic nerve endings. This results in stimulation of cholinergic nerves in both the peripheral and central nervous system. The effects observed in the FOB are consistent with the wide range of effects produced by cholinergic stimulation (Text Table 3). Findings associated with stimulation of the parasympathetic nervous system, including increased salivation and miosis, were noted by all observers in most of the animals. Effects on muscles, as indicated by abnormal posture in the home cage, abnormal posture and gait in the open field, decreased or absent locomotion, muscle fasciculations, and incoordination in the air righting reflex, were also noted by all observers in most animals. In addition, 5/7 observers noted increases of 19% to 30% in mean landing foot splay measurements. Findings indicative of depression of the central nervous system included a low or very low arousal state, as noted by all observers, and no reaction to the approach of a blunt object (6/8 observers) and no reaction to a pain stimulus (7/8 observers). The incidence scores for Observer No. 8 were lower than those recorded by the other observers. Since the scores were low for all measures of cholinergic activity, this suggests that the animals were not evaluated at the time of peak effect or that the animals did not receive a full dose of physostigmine and this was not considered an indication of inability to recognize these effects.

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Text Table 3 – FOB Evaluations for Rats Treated with Physostigmine

	No. of Observations							
	Males (n = 5))				Females (n = 5)			
Evaluations	**Obs. 1**	**Obs. 2**	**Obs. 4**	**Obs. 5**	**Obs. 6**	**Obs. 7**	**Obs. 8**	**Obs. 9**
Home Cage								
• Posture								
lying on side	0	3	0	0	0	0	0	0
flattened	5	2	4	5	5	1	1	5
Handling								
• Salivation								
slight	3	2	2	2	2	3	1	2
moderate	2	1	3	3	1	1	0	0
extreme	0	2	0	0	0	0	0	0
Open Field								
• Gait and Posture								
ataxia	0	0	0	0	0	2	0	2
body drags	3	5	5	5	3	1	1	3
limbs splayed	5	3	0	3	3	1	0	1
hunched posture	0	0	0	0	0	1	0	0
• Locomotion								
decreased	0	0	3	0	2	5	1	3
none	5	5	2	5	3	0	0	2
• Arousal								
low	2	0	1	0	1	3	1	0
very low	3	5	4	5	4	2	0	5
Motor Movements								
• Fasciculations								
slight	4	4	5	4	1	5	1	3
severe	1	1	0	1	4	0	0	2
Reflex								
• Approach								
no response	2	0	3	4	2	2	0	2
• Pain								
no reaction	4	4	5	5	1	1	0	4
• Pupil Response								
miosis	5	5	5	5	5	5	2	5
• Air Righting								
sl. uncoordinated	3	5	1	2	2	2	0	2
lands on side	2	0	3	0	3	2	1	1
lands on back	0	0	1	1	0	0	0	0
Landing Foot Splay								
• % increase	29%	22%	[a]	23%	30%	[a]	[b]	19%

[a]No change in landing foot splay, as compared to saline-treated animals.

[b]Some measurements were performed incorrectly and not considered valid. The number of valid measurements was considered to be too small to provide a valid comparison.

	Neurobehavioral Positive Control Data: Functional Observational Battery	Appendix KK

3.5. CONSISTENCY OF GRIP STRENGTH AND LANDING FOOT SPLAY MEASUREMENTS

Acceptable variability (25-30%) in the measurement of forelimb and hindlimb grip strength and landing foot splay was achieved by all observers.

Text Table 4 - Consistency of Grip Strength and Landing Foot Splay Measurements

Evaluations	Coefficient of Variability (%)							
	Obs. 1	Obs. 2	Obs. 4	Obs. 5	Obs. 6	Obs. 7	Obs. 8	Obs. 9
Forelimb grip strength	11.1	21.1	21.3	22.0	16.0[b]	8.7	8.8	21.1[b]
Hindlimb grip strength	15.3	25.3	32.8[a] 27.2[a]	13.6	18.4	20.5	16.0	20.6
Landing foot splay	23.5	19.1	25.4	22.4	15.4	23.4	9.8[c]	29.1

[a]Original value was unacceptable. Evaluations were repeated using untreated animals (5 males and 5 females).

[b]Original value was unacceptable. Evaluations were repeated using untreated animals (10 females).

[c]Measurements of landing foot splay were performed incorrectly and were repeated with ten untreated animals.

4. CONCLUSION

Treatment of Sprague-Dawley rats with Chlorpromazine, D-Amphetamine Sulfate, or Physostigmine produced patterns of behavior consistent with their expected neurological effects. These data provide evidence that the procedures used for the Functional Observational Battery evaluations in the Testing Facility are capable of detecting major neurotoxic endpoints. In addition, the neurobehavioral profiles for each compound were correctly identified by Observers 1-2 and 4-9, who were blinded with respect to treatment. This demonstrates that there is interobserver reliability among the trained technicians at the Testing Facility in the conduct of the Functional Observational Battery evaluations. Acceptable variability in the performance of forelimb and hindlimb grip strength measurements and landing foot splay measurements were achieved by all observers. In conclusion, Observers 1, 2, 4, 5, 6, 7, 8, and 9 were considered to be fully qualified to perform Functional Observational Battery evaluations.

Males	Neurobehavioral Positive Control Data: Functional Observational Battery Mean Body Weights, Grip Strength and Landing Foot Splay Values	Appendix KK

Observer 1 Test Article:		Group 1 Saline	Group 2 Chlorpromazine	Group 3 D-Amphetamine Sulfate	Group 4 Physostigmine
Body Weight	Mean	567.0	569.7	604.1	544.0
	S.D.	27.9	25.0	39.8	45.7
	N	5	5	5	5
Forelimb Grip Strength	Mean	926.0	680.5 *	1070.0	851.5
	S.D.	102.5	142.5	137.5	167.6
	N	5	5	5	5
	%CV	11.1			
Hindlimb Grip Strength	Mean	781.5	635.5	831.0	622.5 *
	S.D.	119.8	85.6	69.9	80.4
	N	5	5	5	5
	%CV	15.3			
Landing Foot Splay	Mean	4.8	6.5	5.4	6.2
	S.D.	1.1	1.6	1.7	1.6
	N	5	5	5	5
	%CV	23.5			

*Significantly different from control mean; p≤0.05.

**Significantly different from control mean; p≤0.01.

If no asterisks, no statistically significant differences from control mean.

%CV = (Control Group S.D./Control Group Mean) x 100.

Males	Neurobehavioral Positive Control Data: Functional Observational Battery Mean Body Weights, Grip Strength and Landing Foot Splay Values	Appendix KK

Observer 2 Test Article:		Group 1 Saline	Group 2 Chlorpromazine	Group 3 D-Amphetamine Sulfate	Group 4 Physostigmine
Body Weight	Mean	572.4	572.0	608.2	547.6
	S.D.	20.9	26.6	36.4	45.9
	N	5	5	5	5
Forelimb Grip Strength	Mean	858.0	1210.0	797.0	941.5
	S.D.	181.2	369.8	266.0	244.6
	N	5	5	5	5
	%CV	21.1			
Hindlimb Grip Strength	Mean	908.5	876.5	773.0	807.5
	S.D.	230.1	216.4	103.4	127.5
	N	5	5	5	5
	%CV	25.3			
			*		
Landing Foot Splay	Mean	6.7	9.0	5.7	8.2
	S.D.	1.3	1.8	0.9	1.0
	N	5	5	5	5
	%CV	19.1			

*Significantly different from control mean; p≤0.05.

**Significantly different from control mean; p≤0.01.

If no asterisks, no statistically significant differences from control mean.

%CV = (Control Group S.D./Control Group Mean) x 100.

Males	Neurobehavioral Positive Control Data: Functional Observational Battery Mean Body Weights, Grip Strength and Landing Foot Splay Values	Appendix KK

Observer 3 Test Article:		Group 1 Saline	Group 2 Chlorpromazine	Group 3 D-Amphetamine Sulfate	Group 4 Physostigmine
Body Weight	Mean	475.4	490.0	506.3	462.3
	S.D.	24.2	30.2	28.9	37.5
	N	5	5	5	5
Forelimb Grip Strength	Mean	1499.5	1323.5	1909.0	1278.0
	S.D.	470.4	715.3	344.9	351.5
	N	5	5	5	5
	%CV	31.4			
Hindlimb Grip Strength	Mean	955.5	837.5	1102.0	906.5
	S.D.	270.5	255.7	230.2	251.5
	N	5	5	5	5
	%CV	28.3			
Landing Foot Splay	Mean	6.8	8.3	6.1	6.3
	S.D.	0.9	2.5	0.8	1.4
	N	5	5	5	5
	%CV	13.4			

*Significantly different from control mean; $p \leq 0.05$.

**Significantly different from control mean; $p \leq 0.01$.

If no asterisks, no statistically significant differences from control mean.

%CV = (Control Group S.D./Control Group Mean) x 100.

Males	Neurobehavioral Positive Control Data: Functional Observational Battery Mean Body Weights, Grip Strength and Landing Foot Splay Values	Appendix KK

Observer 4 Test Article:		Group 1 Saline	Group 2 Chlorpromazine	Group 3 D-Amphetamine Sulfate	Group 4 Physostigmine
Body Weight	Mean	456.9	468.7	494.6	448.3
	S.D.	21.3	30.1	26.5	37.0
	N	5	5	5	5
					*
Forelimb Grip Strength	Mean	1224.0	1161.0	1311.0	901.5
	S.D.	261.3	149.0	179.6	276.0
	N	5	5	5	5
	%CV	21.3			
Hindlimb Grip Strength	Mean	622.5	577.5	601.0	572.0
	S.D.	238.7	202.9	122.3	206.0
	N	5	5	5	5
	%CV	38.3			
Landing Foot Splay	Mean	7.2	8.4	7.1	6.9
	S.D.	1.8	1.8	1.1	1.5
	N	5	5	5	5
	%CV	25.4			

*Significantly different from control mean; p≤0.05.

**Significantly different from control mean; p≤0.01.

If no asterisks, no statistically significant differences from control mean.

%CV = (Control Group S.D./Control Group Mean) x 100.

Males	Neurobehavioral Positive Control Data: Functional Observational Battery Mean Body Weights, Grip Strength and Landing Foot Splay Values	Appendix KK

Observer 5 Test Article:		Group 1 Saline	Group 2 Chlorpromazine	Group 3 D-Amphetamine Sulfate	Group 4 Physostigmine
Body Weight	Mean	558.9	564.5	591.7	530.9
	S.D.	27.4	30.3	37.8	41.4
	N	5	5	5	5
					*
Forelimb Grip Strength	Mean	1352.5	1179.0	1458.5	980.5
	S.D.	296.9	327.7	170.8	186.7
	N	5	5	5	5
	%CV	22.0			
					**
Hindlimb Grip Strength	Mean	1428.0	1105.0	1266.0	941.0
	S.D.	193.8	312.4	162.7	300.3
	N	5	5	5	5
	%CV	13.6			
Landing Foot Splay	Mean	8.7	10.5	8.9	10.7
	S.D.	1.9	1.7	1.3	1.5
	N	5	5	5	5
	%CV	22.4			

*Significantly different from control mean; p≤0.05.

**Significantly different from control mean; p≤0.01.

If no asterisks, no statistically significant differences from control mean.

%CV = (Control Group S.D./Control Group Mean) x 100.

Females	Neurobehavioral Positive Control Data: Functional Observational Battery Mean Body Weights, Grip Strength and Landing Foot Splay Values	Appendix KK

Observer 6 Test Article:		Group 1 Saline	Group 2 Chlorpromazine	Group 3 D-Amphetamine Sulfate	Group 4 Physostigmine
Body Weight	Mean	313.0	314.5	311.5	311.0
	S.D.	18.4	26.3	46.9	10.5
	N	5	5	5	5
Forelimb Grip Strength	Mean	667.0	847.5	1005.5	708.0
	S.D.	294.4	143.6	159.5	203.3
	N	5	5	5	5
	%CV	44.1			
Hindlimb Grip Strength	Mean	827.5	835.5	947.0	820.0
	S.D.	152.2	161.6	50.1	136.6
	N	5	5	5	5
	%CV	18.4			
			*		
Landing Foot Splay	Mean	5.0	7.3	4.0	6.5
	S.D.	0.8	0.6	0.8	1.8
	N	5	5	5	5
	%CV	15.4			

*Significantly different from control mean; p≤0.05.

**Significantly different from control mean; p≤0.01.

If no asterisks, no statistically significant differences from control mean.

%CV = (Control Group S.D./Control Group Mean) x 100.

Females	Neurobehavioral Positive Control Data: Functional Observational Battery Mean Body Weights, Grip Strength and Landing Foot Splay Values	Appendix KK

Observer 7 Test Article:		Group 1 Saline	Group 2 Chlorpromazine	Group 3 D-Amphetamine Sulfate	Group 4 Physostigmine
Body Weight	Mean	313.0	312.3	305.5	310.1
	S.D.	17.5	26.1	33.0	13.2
	N	5	5	5	5
Forelimb Grip Strength	Mean	815.0	869.5	975.5	766.5
	S.D.	71.2	124.3	147.4	161.4
	N	5	5	5	5
	%CV	8.7			
Hindlimb Grip Strength	Mean	620.0	560.5	673.0	642.5
	S.D.	127.2	116.7	105.2	174.5
	N	5	5	5	5
	%CV	20.5			
Landing Foot Splay	Mean	6.6	7.7	5.7	6.4
	S.D.	1.5	0.8	0.8	1.8
	N	5	5	5	5
	%CV	23.4			

*Significantly different from control mean; p≤0.05.

**Significantly different from control mean; p≤0.01.

If no asterisks, no statistically significant differences from control mean.

%CV = (Control Group S.D./Control Group Mean) x 100.

Females	Neurobehavioral Positive Control Data: Functional Observational Battery Mean Body Weights, Grip Strength and Landing Foot Splay Values	Appendix KK

Observer 8 Test Article:		Group 1 Saline	Group 2 Chlorpromazine	Group 3 D-Amphetamine Sulfate	Group 4 Physostigmine
Body Weight	Mean	268.7	298.0	276.1	280.3
	S.D.	19.5	55.7	27.3	12.4
	N	5	5	5	5
Forelimb Grip Strength	Mean	1006.5	799.5	912.5	829.5
	S.D.	88.6	148.1	108.9	180.2
	N	5	5	5	5
	%CV	8.8			
Hindlimb Grip Strength	Mean	735.0	605.5	571.0	695.5
	S.D.	117.9	158.6	101.9	238.0
	N	5	5	5	5
	%CV	16.0			
Landing Foot Splay	Mean	6.4	6.2	6.0	5.1
	S.D.	1.6	0.3	-	0.6
	N	3	3	1	2
	%CV	25.0			

*Significantly different from control mean; p≤0.05.

**Significantly different from control mean; p≤0.01.

If no asterisks, no statistically significant differences from control mean.

%CV = (Control Group S.D./Control Group Mean) x 100.

Females	Neurobehavioral Positive Control Data: Functional Observational Battery Mean Body Weights, Grip Strength and Landing Foot Splay Values	Appendix KK

Observer 9 Test Article:		Group 1 Saline	Group 2 Chlorpromazine	Group 3 D-Amphetamine Sulfate	Group 4 Physostigmine
Body Weight	Mean	315.9	313.5	310.8	311.1
	S.D.	18.3	25.5	48.3	11.1
	N	5	5	5	5
Forelimb Grip Strength	Mean	539.5	963.0	823.0	606.5
	S.D.	292.8	456.9	330.6	327.3
	N	5	5	5	5
	%CV	54.3			
Hindlimb Grip Strength	Mean	632.0	588.0	637.0	647.5
	S.D.	130.3	67.2	128.0	161.7
	N	5	5	5	5
	%CV	20.6			
Landing Foot Splay	Mean	6.3	7.9	4.4	7.5
	S.D.	1.8	1.4	1.3	1.8
	N	5	5	5	5
	%CV	29.1			

*Significantly different from control mean; $p \leq 0.05$.

**Significantly different from control mean; $p \leq 0.01$.

If no asterisks, no statistically significant differences from control mean.

%CV = (Control Group S.D./Control Group Mean) x 100.

Repeats	Neurobehavioral Positive Control Data: Functional Observational Battery Mean Body Weights, Grip Strength and Landing Foot Splay Values	Appendix KK

Observer 4 Repeat

Test Article:		**Untreated Males**	**Untreated Females**
Forelimb Grip Strength	Mean	1373.0	1167.0
	S.D.	168.3	293.8
	N	5	5
	%CV	12.3	25.2
Hindlimb Grip Strength	Mean	864.5	645.5
	S.D.	235.0	211.9
	N	5	5
	%CV	27.2	32.8

Observer 6 Repeat

Test Article:		**Untreated Females**
Forelimb Grip Strength	Mean	970.5
	S.D.	154.9
	N	10
	%CV	16.0
Hindlimb Grip Strength	Mean	743.3
	S.D.	147.0
	N	10
	%CV	19.8

Observer 8 Repeat

Test Article:		**Saline Males**
Landing Foot Splay	Mean	9.5
	S.D.	0.9
	N	10
	%CV	9.8

%CV = (Control Group S.D./Control Group Mean) x 100.

Repeats	Neurobehavioral Positive Control Data: Functional Observational Battery Mean Body Weights, Grip Strength and Landing Foot Splay Values	Appendix KK

Observer 9 Repeat

Test Article:		**Untreated Females**
Forelimb Grip Strength	Mean	882.0
	S.D.	186.0
	N	10
	%CV	21.1
Hindlimb Grip Strength	Mean	555.8
	S.D.	178.3
	N	10
	%CV	32.1

%CV = (Control Group S.D./Control Group Mean) x 100.

	Neurobehavioral Positive Control Data: Functional Observational Battery Incidence Summary of Functional Observational Battery Evaluations Preface	Appendix KK

Corresponding test articles for each group were as follows:

Group 1	-	Saline
Group 2	-	Chlorpromazine
Group 3	-	D-Amphetamine Sulfate
Group 4	-	Physostigmine

For summarization purposes, comments describing location [i.e., forelimb, hindlimb, right, unilateral, etc.] are not presented in this appendix. These data are contained in the study raw data if needed.

When an animal received two scores during Open Field Evaluations of Gait and Posture (i.e. the animal was noted to be dragging it's body and it's limbs were splayed or dragging), the two scores were summarized individually. Therefore, the total incidence of scores may be greater than the number of animals examined.

Males	Neurobehavioral Positive Control Data: Functional Observational Battery Incidence Summary of Functional Observational Battery Evaluations	Appendix KK

Observer 1		**Group:**	**1**	**2**	**3**	**4**
Number of Animals Examined			5	5	5	5
Home Cage Evaluations						
Posture	Sitting or Standing Normally		1	2	1	0
	Alert, Oriented Toward Observer		4	0	4	0
	Asleep		0	0	0	0
	Lying on Side		0	2	0	0
	Flattened		0	1	0	5
	Crouched		0	0	0	0
Vocalizations	Not Present		5	5	5	5
	Present		0	0	0	0
Palpebral Closure	Eyelids Open		5	0	5	5
	Eyelids Completely Closed		0	0	0	0
	Eyelids Slightly Drooping		0	4	0	0
	Eyelids Half Closed		0	1	0	0
Handling Evaluations						
Ease of Removal	Very Easy		3	4	2	5
	Easy		1	1	2	0
	Moderately Difficult		1	0	1	0
	Freezes		0	0	0	0
	Difficult		0	0	0	0
Ease of Handling	Normal (easy, alert)		4	5	4	5
	Moderately Difficult		1	0	1	0
	Freezes		0	0	0	0
	Difficult		0	0	0	0
	Totally limp		0	0	0	0
Chromodacryorrhea	Not Present		5	5	5	5
	Present		0	0	0	0
Lacrimation	Not Present		5	1	5	5
	Moderate		0	4	0	0
	Extreme		0	0	0	0
Coat	Normal		5	5	5	5
	Slightly Soiled		0	0	0	0
	Moderately Soiled		0	0	0	0
	Extremely Soiled		0	0	0	0
Salivation	Not Present		5	5	4	0
	Slight		0	0	1	3
	Moderate		0	0	0	2
	Extreme		0	0	0	0

Males	Neurobehavioral Positive Control Data: Functional Observational Battery Incidence Summary of Functional Observational Battery Evaluations	Appendix KK

Observer 1		**Group:**	**1**	**2**	**3**	**4**
Number of Animals Examined			5	5	5	5
Open Field Evaluations						
Gait and Posture	Normal		5	0	4	0
	Ataxia		0	0	1	0
	Body Drags		0	1	0	3
	Limbs Splayed or Dragging		0	5	0	5
	Hunched Posture		0	0	0	0
Locomotion	Normal		5	0	1	0
	Increased Movement		0	0	1	0
	Decreased Movement		0	0	3	0
	None		0	5	0	5
Arousal	Normal		4	0	1	0
	Low, Slight Stupor		1	0	1	2
	Very Low, Stupor		0	5	1	3
	High, Slight Excitement, Tense		0	0	1	0
	Very High, Hyper-Alert		0	0	1	0
Piloerection	Not Present		5	5	5	5
	Present		0	0	0	0
Exophthalmia	Not Present		5	5	5	5
	Present		0	0	0	0
Feces	Number of Boluses		6	11	0	3
	Unformed Stool		0	0	0	0
Urine	Number of Pools		4	3	0	5
	Polyuria		0	0	0	0
Stereotypic Behavior						
Stereotypic Behavior	Not Present		5	5	1	5
	Present		0	0	4	0
Motor Movements						
Fasciculations	Not Present		5	5	5	0
	Slight		0	0	0	4
	Severe		0	0	0	1
Convulsions	Not Present		5	5	5	5
	Slight		0	0	0	0
	Severe		0	0	0	0
Tremors	Not Present		5	5	5	5
	Slight		0	0	0	0
	Severe		0	0	0	0

Males	Neurobehavioral Positive Control Data: Functional Observational Battery Incidence Summary of Functional Observational Battery Evaluations	Appendix KK

Observer 1		**Group:**	**1**	**2**	**3**	**4**
Number of Animals Examined			5	5	5	5
Reflex Assessments						
Approach Response	Normal: Slowly Approaches, Sniffs and/or Turns Away		5	2	4	3
	No Reaction		0	3	1	2
	Freezes or Pulls Away Slightly		0	0	0	0
	Jumps or Turns Abruptly to Avoid, or attacks and/or bites		0	0	0	0
Audition	Normal: Flinches or Flicks Ears		5	5	5	5
	No Reaction		0	0	0	0
	Exaggerated; Jumps, Flips, Bites		0	0	0	0
Pain	Normal: Turns/Bites or Walks Forward/Away		5	4	3	1
	No Reaction		0	1	2	4
	Apparent Increased Pain		0	0	0	0
Pupil Response	Pupil Constricts		5	4	5	0
	No Constriction		0	0	0	0
	Miosis		0	1	0	5
	Mydriasis		0	0	0	0
Pinna	Ear Flattens Against Head		0	0	0	0
	Animal Shakes Head		5	5	5	5
	No Response		0	0	0	0
Proprioception	Normal: Returns Leg to Original Position		5	5	5	5
	Returns Leg Only Partially to Original Position		0	0	0	0
	No Response		0	0	0	0
Air Righting Reflex	Normal: Lands on All Four Feet		5	1	5	0
	Slightly Uncoordinated		0	3	0	3
	Lands on Side		0	1	0	2
	Lands on Back		0	0	0	0

Males	Neurobehavioral Positive Control Data: Functional Observational Battery Incidence Summary of Functional Observational Battery Evaluations	Appendix KK

Observer 2		**Group:**	**1**	**2**	**3**	**4**
Number of Animals Examined			5	5	5	5
Home Cage Evaluations						
Posture	Sitting or Standing Normally		4	3	1	0
	Alert, Oriented Toward Observer		1	1	4	0
	Asleep		0	0	0	0
	Lying on Side		0	0	0	3
	Flattened		0	1	0	2
	Crouched		0	0	0	0
Vocalizations	Not Present		5	5	5	5
	Present		0	0	0	0
Palpebral Closure	Eyelids Open		5	4	5	5
	Eyelids Completely Closed		0	0	0	0
	Eyelids Slightly Drooping		0	1	0	0
	Eyelids Half Closed		0	0	0	0
Handling Evaluations						
Ease of Removal	Very Easy		0	1	4	4
	Easy		5	4	1	1
	Moderately Difficult		0	0	0	0
	Freezes		0	0	0	0
	Difficult		0	0	0	0
Ease of Handling	Normal (easy, alert)		5	5	5	5
	Moderately Difficult		0	0	0	0
	Freezes		0	0	0	0
	Difficult		0	0	0	0
	Totally limp		0	0	0	0
Chromodacryorrhea	Not Present		5	4	5	5
	Present		0	1	0	0
Lacrimation	Not Present		5	4	5	5
	Moderate		0	1	0	0
	Extreme		0	0	0	0
Coat	Normal		5	5	5	5
	Slightly Soiled		0	0	0	0
	Moderately Soiled		0	0	0	0
	Extremely Soiled		0	0	0	0
Salivation	Not Present		5	5	4	0
	Slight		0	0	1	2
	Moderate		0	0	0	1
	Extreme		0	0	0	2

Males	Neurobehavioral Positive Control Data: Functional Observational Battery Incidence Summary of Functional Observational Battery Evaluations	Appendix KK

Observer 2		**Group:**	**1**	**2**	**3**	**4**
Number of Animals Examined			5	5	5	5
Open Field Evaluations						
Gait and Posture	Normal		5	0	4	0
	Ataxia		0	0	1	0
	Body Drags		0	0	0	5
	Limbs Splayed or Dragging		0	5	0	3
	Hunched Posture		0	0	0	0
Locomotion	Normal		4	0	2	0
	Increased Movement		0	0	2	0
	Decreased Movement		1	0	1	0
	None		0	5	0	5
Arousal	Normal		4	0	2	0
	Low, Slight Stupor		1	0	1	0
	Very Low, Stupor		0	5	1	5
	High, Slight Excitement, Tense		0	0	0	0
	Very High, Hyper-Alert		0	0	1	0
Piloerection	Not Present		5	5	5	5
	Present		0	0	0	0
Exophthalmia	Not Present		5	5	5	5
	Present		0	0	0	0
Feces	Number of Boluses		6	1	1	1
	Unformed Stool		0	0	0	0
Urine	Number of Pools		12	7	6	12
	Polyuria		0	0	0	0
Stereotypic Behavior						
Stereotypic Behavior	Not Present		5	5	0	4
	Present		0	0	5	1
Motor Movements						
Fasciculations	Not Present		5	5	5	0
	Slight		0	0	0	4
	Severe		0	0	0	1
Convulsions	Not Present		5	5	5	5
	Slight		0	0	0	0
	Severe		0	0	0	0
Tremors	Not Present		5	5	5	5
	Slight		0	0	0	0
	Severe		0	0	0	0

Males	Neurobehavioral Positive Control Data: Functional Observational Battery Incidence Summary of Functional Observational Battery Evaluations	Appendix KK

Observer 2		**Group:**	**1**	**2**	**3**	**4**
Number of Animals Examined			5	5	5	5
Reflex Assessments						
Approach Response	Normal: Slowly Approaches, Sniffs and/or Turns Away		5	2	5	5
	No Reaction		0	3	0	0
	Freezes or Pulls Away Slightly		0	0	0	0
	Jumps or Turns Abruptly to Avoid, or attacks and/or bites		0	0	0	0
Audition	Normal: Flinches or Flicks Ears		4	3	5	3
	No Reaction		1	2	0	0
	Exaggerated; Jumps, Flips, Bites		0	0	0	2
Pain	Normal: Turns/Bites or Walks Forward/Away		5	5	5	1
	No Reaction		0	0	0	4
	Apparent Increased Pain		0	0	0	0
Pupil Response	Pupil Constricts		5	3	4	0
	No Constriction		0	0	0	0
	Miosis		0	2	1	5
	Mydriasis		0	0	0	0
Pinna	Ear Flattens Against Head		0	0	1	0
	Animal Shakes Head		5	5	4	5
	No Response		0	0	0	0
Proprioception	Normal: Returns Leg to Original Position		5	5	5	5
	Returns Leg Only Partially to Original Position		0	0	0	0
	No Response		0	0	0	0
Air Righting Reflex	Normal: Lands on All Four Feet		5	3	5	0
	Slightly Uncoordinated		0	2	0	5
	Lands on Side		0	0	0	0
	Lands on Back		0	0	0	0

Males	Neurobehavioral Positive Control Data: Functional Observational Battery Incidence Summary of Functional Observational Battery Evaluations	Appendix KK

Observer 3		**Group:**	**1**	**2**	**3**	**4**
Number of Animals Examined			5	5	5	5
Home Cage Evaluations						
Posture	Sitting or Standing Normally		2	3	0	1
	Alert, Oriented Toward Observer		3	0	5	0
	Asleep		0	0	0	0
	Lying on Side		0	0	0	1
	Flattened		0	2	0	3
	Crouched		0	0	0	0
Vocalizations	Not Present		5	5	5	5
	Present		0	0	0	0
Palpebral Closure	Eyelids Open		5	3	5	5
	Eyelids Completely Closed		0	0	0	0
	Eyelids Slightly Drooping		0	2	0	0
	Eyelids Half Closed		0	0	0	0
Handling Evaluations						
Ease of Removal	Very Easy		3	3	5	5
	Easy		1	2	0	0
	Moderately Difficult		1	0	0	0
	Freezes		0	0	0	0
	Difficult		0	0	0	0
Ease of Handling	Normal (easy, alert)		3	4	5	5
	Moderately Difficult		2	1	0	0
	Freezes		0	0	0	0
	Difficult		0	0	0	0
	Totally limp		0	0	0	0
Chromodacryorrhea	Not Present		5	5	5	4
	Present		0	0	0	1
Lacrimation	Not Present		5	3	5	5
	Moderate		0	2	0	0
	Extreme		0	0	0	0
Coat	Normal		5	5	5	4
	Slightly Soiled		0	0	0	1
	Moderately Soiled		0	0	0	0
	Extremely Soiled		0	0	0	0
Salivation	Not Present		5	5	5	2
	Slight		0	0	0	1
	Moderate		0	0	0	2
	Extreme		0	0	0	0

Males	Neurobehavioral Positive Control Data: Functional Observational Battery Incidence Summary of Functional Observational Battery Evaluations	Appendix KK

Observer 3		**Group:**	**1**	**2**	**3**	**4**
Number of Animals Examined			5	5	5	5
Open Field Evaluations						
Gait and Posture	Normal		5	0	5	0
	Ataxia		0	1	0	1
	Body Drags		0	3	0	4
	Limbs Splayed or Dragging		0	3	0	3
	Hunched Posture		0	0	0	0
Locomotion	Normal		5	0	4	0
	Increased Movement		0	0	1	1
	Decreased Movement		0	2	0	1
	None		0	3	0	3
Arousal	Normal		5	0	1	0
	Low, Slight Stupor		0	2	0	2
	Very Low, Stupor		0	3	0	3
	High, Slight Excitement, Tense		0	0	4	0
	Very High, Hyper-Alert		0	0	0	0
Piloerection	Not Present		5	5	5	5
	Present		0	0	0	0
Exophthalmia	Not Present		5	5	5	5
	Present		0	0	0	0
Feces	Number of Boluses		1	1	0	2
	Unformed Stool		0	0	0	0
Urine	Number of Pools		3	5	0	3
	Polyuria		0	0	0	0
Stereotypic Behavior						
Stereotypic Behavior	Not Present		5	5	2	5
	Present		0	0	3	0
Motor Movements						
Fasciculations	Not Present		5	5	5	2
	Slight		0	0	0	2
	Severe		0	0	0	1
Convulsions	Not Present		5	5	5	5
	Slight		0	0	0	0
	Severe		0	0	0	0
Tremors	Not Present		5	5	5	4
	Slight		0	0	0	0
	Severe		0	0	0	1

Males	Neurobehavioral Positive Control Data: Functional Observational Battery Incidence Summary of Functional Observational Battery Evaluations	Appendix KK

Observer 3		**Group:**	**1**	**2**	**3**	**4**
Number of Animals Examined			5	5	5	5
Reflex Assessments						
Approach Response	Normal: Slowly Approaches, Sniffs and/or Turns Away		5	1	2	3
	No Reaction		0	4	3	2
	Freezes or Pulls Away Slightly		0	0	0	0
	Jumps or Turns Abruptly to Avoid, or attacks and/or bites		0	0	0	0
Audition	Normal: Flinches or Flicks Ears		5	4	5	4
	No Reaction		0	1	0	1
	Exaggerated; Jumps, Flips, Bites		0	0	0	0
Pain	Normal: Turns/Bites or Walks Forward/Away		5	5	5	3
	No Reaction		0	0	0	2
	Apparent Increased Pain		0	0	0	0
Pupil Response	Pupil Constricts		5	5	5	2
	No Constriction		0	0	0	1
	Miosis		0	0	0	2
	Mydriasis		0	0	0	0
Pinna	Ear Flattens Against Head		0	0	1	0
	Animal Shakes Head		5	5	4	5
	No Response		0	0	0	0
Proprioception	Normal: Returns Leg to Original Position		5	5	5	4
	Returns Leg Only Partially to Original Position		0	0	0	0
	No Response		0	0	0	1
Air Righting Reflex	Normal: Lands on All Four Feet		5	5	5	1
	Slightly Uncoordinated		0	0	0	2
	Lands on Side		0	0	0	2
	Lands on Back		0	0	0	0

Males	Neurobehavioral Positive Control Data: Functional Observational Battery Incidence Summary of Functional Observational Battery Evaluations	Appendix KK

Observer 4		**Group:**	**1**	**2**	**3**	**4**
Number of Animals Examined			5	5	5	5
Home Cage Evaluations						
Posture	Sitting or Standing Normally		5	3	3	1
	Alert, Oriented Toward Observer		0	0	2	0
	Asleep		0	0	0	0
	Lying on Side		0	0	0	0
	Flattened		0	2	0	4
	Crouched		0	0	0	0
Vocalizations	Not Present		5	5	5	5
	Present		0	0	0	0
Palpebral Closure	Eyelids Open		5	5	5	5
	Eyelids Completely Closed		0	0	0	0
	Eyelids Slightly Drooping		0	0	0	0
	Eyelids Half Closed		0	0	0	0
Handling Evaluations						
Ease of Removal	Very Easy		4	4	4	5
	Easy		1	1	0	0
	Moderately Difficult		0	0	1	0
	Freezes		0	0	0	0
	Difficult		0	0	0	0
Ease of Handling	Normal (easy, alert)		5	5	5	5
	Moderately Difficult		0	0	0	0
	Freezes		0	0	0	0
	Difficult		0	0	0	0
	Totally limp		0	0	0	0
Chromodacryorrhea	Not Present		5	5	5	5
	Present		0	0	0	0
Lacrimation	Not Present		5	3	5	3
	Moderate		0	2	0	0
	Extreme		0	0	0	2
Coat	Normal		5	5	5	5
	Slightly Soiled		0	0	0	0
	Moderately Soiled		0	0	0	0
	Extremely Soiled		0	0	0	0
Salivation	Not Present		5	5	5	0
	Slight		0	0	0	2
	Moderate		0	0	0	3
	Extreme		0	0	0	0

Males	Neurobehavioral Positive Control Data: Functional Observational Battery Incidence Summary of Functional Observational Battery Evaluations	Appendix KK

Observer 4		**Group:**	**1**	**2**	**3**	**4**
Number of Animals Examined			5	5	5	5
Open Field Evaluations						
Gait and Posture	Normal		5	2	5	0
	Ataxia		0	0	0	0
	Body Drags		0	2	0	5
	Limbs Splayed or Dragging		0	1	0	0
	Hunched Posture		0	0	0	0
Locomotion	Normal		5	2	3	0
	Increased Movement		0	0	2	0
	Decreased Movement		0	0	0	3
	None		0	3	0	2
Arousal	Normal		4	2	3	0
	Low, Slight Stupor		0	0	0	1
	Very Low, Stupor		0	3	0	4
	High, Slight Excitement, Tense		1	0	2	0
	Very High, Hyper-Alert		0	0	0	0
Piloerection	Not Present		5	5	4	5
	Present		0	0	1	0
Exophthalmia	Not Present		5	5	5	5
	Present		0	0	0	0
Feces	Number of Boluses		5	8	0	1
	Unformed Stool		0	0	0	0
Urine	Number of Pools		4	5	2	6
	Polyuria		0	0	0	0
Stereotypic Behavior						
Stereotypic Behavior	Not Present		5	5	3	4
	Present		0	0	2	1
Motor Movements						
Fasciculations	Not Present		5	5	5	0
	Slight		0	0	0	5
	Severe		0	0	0	0
Convulsions	Not Present		5	5	5	5
	Slight		0	0	0	0
	Severe		0	0	0	0
Tremors	Not Present		5	5	5	3
	Slight		0	0	0	1
	Severe		0	0	0	1

Males	Neurobehavioral Positive Control Data: Functional Observational Battery Incidence Summary of Functional Observational Battery Evaluations	Appendix KK

Observer 4		**Group:**	**1**	**2**	**3**	**4**
Number of Animals Examined			5	5	5	5
Reflex Assessments						
Approach Response	Normal: Slowly Approaches, Sniffs and/or Turns Away		5	3	2	2
	No Reaction		0	2	3	3
	Freezes or Pulls Away Slightly		0	0	0	0
	Jumps or Turns Abruptly to Avoid, or attacks and/or bites		0	0	0	0
Audition	Normal: Flinches or Flicks Ears		5	3	5	4
	No Reaction		0	2	0	0
	Exaggerated; Jumps, Flips, Bites		0	0	0	1
Pain	Normal: Turns/Bites or Walks Forward/Away		5	5	4	0
	No Reaction		0	0	1	5
	Apparent Increased Pain		0	0	0	0
Pupil Response	Pupil Constricts		5	5	5	0
	No Constriction		0	0	0	0
	Miosis		0	0	0	5
	Mydriasis		0	0	0	0
Pinna	Ear Flattens Against Head		0	1	1	0
	Animal Shakes Head		5	4	4	5
	No Response		0	0	0	0
Proprioception	Normal: Returns Leg to Original Position		5	5	5	5
	Returns Leg Only Partially to Original Position		0	0	0	0
	No Response		0	0	0	0
Air Righting Reflex	Normal: Lands on All Four Feet		5	4	5	0
	Slightly Uncoordinated		0	0	0	1
	Lands on Side		0	1	0	3
	Lands on Back		0	0	0	1

Males	Neurobehavioral Positive Control Data: Functional Observational Battery Incidence Summary of Functional Observational Battery Evaluations	Appendix KK

Observer 5		**Group:**	**1**	**2**	**3**	**4**
Number of Animals Examined			5	5	5	5
Home Cage Evaluations						
Posture	Sitting or Standing Normally		3	3	0	0
	Alert, Oriented Toward Observer		2	1	5	0
	Asleep		0	0	0	0
	Lying on Side		0	0	0	0
	Flattened		0	1	0	5
	Crouched		0	0	0	0
Vocalizations	Not Present		5	5	5	5
	Present		0	0	0	0
Palpebral Closure	Eyelids Open		5	3	5	5
	Eyelids Completely Closed		0	0	0	0
	Eyelids Slightly Drooping		0	1	0	0
	Eyelids Half Closed		0	1	0	0
Handling Evaluations						
Ease of Removal	Very Easy		5	4	5	5
	Easy		0	1	0	0
	Moderately Difficult		0	0	0	0
	Freezes		0	0	0	0
	Difficult		0	0	0	0
Ease of Handling	Normal (easy, alert)		5	4	5	5
	Moderately Difficult		0	1	0	0
	Freezes		0	0	0	0
	Difficult		0	0	0	0
	Totally limp		0	0	0	0
Chromodacryorrhea	Not Present		5	5	5	5
	Present		0	0	0	0
Lacrimation	Not Present		5	5	5	5
	Moderate		0	0	0	0
	Extreme		0	0	0	0
Coat	Normal		5	5	5	4
	Slightly Soiled		0	0	0	1
	Moderately Soiled		0	0	0	0
	Extremely Soiled		0	0	0	0
Salivation	Not Present		5	5	4	0
	Slight		0	0	1	2
	Moderate		0	0	0	3
	Extreme		0	0	0	0

Males	Neurobehavioral Positive Control Data: Functional Observational Battery Incidence Summary of Functional Observational Battery Evaluations	Appendix KK

Observer 5		**Group:**	**1**	**2**	**3**	**4**
Number of Animals Examined			5	5	5	5
Open Field Evaluations						
Gait and Posture[a]	Normal		5	1	5	0
	Ataxia		0	0	0	0
	Body Drags		0	2	0	5
	Limbs Splayed or Dragging		0	1	0	3
	Hunched Posture		0	0	0	0
Locomotion	Normal		5	0	5	0
	Increased Movement		0	0	0	0
	Decreased Movement		0	1	0	0
	None		0	4	0	5
Arousal	Normal		4	0	0	0
	Low, Slight Stupor		1	0	1	0
	Very Low, Stupor		0	5	0	5
	High, Slight Excitement, Tense		0	0	4	0
	Very High, Hyper-Alert		0	0	0	0
Piloerection	Not Present		5	5	5	5
	Present		0	0	0	0
Exophthalmia	Not Present		5	5	5	5
	Present		0	0	0	0
Feces	Number of Boluses		6	4	0	1
	Unformed Stool		0	0	0	0
Urine	Number of Pools		2	6	0	6
	Polyuria		0	0	0	0
Stereotypic Behavior						
Stereotypic Behavior	Not Present		5	5	1	5
	Present		0	0	4	0
Motor Movements						
Fasciculations	Not Present		5	5	5	0
	Slight		0	0	0	4
	Severe		0	0	0	1
Convulsions	Not Present		5	5	5	5
	Slight		0	0	0	0
	Severe		0	0	0	0
Tremors	Not Present		5	5	5	5
	Slight		0	0	0	0
	Severe		0	0	0	0

[a]Gait for two Group 2 animals could not be determined because the animals did not move during the observation period.

Males	Neurobehavioral Positive Control Data: Functional Observational Battery Incidence Summary of Functional Observational Battery Evaluations	Appendix KK

Observer 5		**Group:**	**1**	**2**	**3**	**4**
Number of Animals Examined			5	5	5	5
Reflex Assessments						
Approach Response	Normal: Slowly Approaches, Sniffs and/or Turns Away		5	1	4	1
	No Reaction		0	4	1	4
	Freezes or Pulls Away Slightly		0	0	0	0
	Jumps or Turns Abruptly to Avoid, or attacks and/or bites		0	0	0	0
Audition	Normal: Flinches or Flicks Ears		5	5	4	4
	No Reaction		0	0	0	0
	Exaggerated; Jumps, Flips, Bites		0	0	1	1
Pain	Normal: Turns/Bites or Walks Forward/Away		5	5	4	0
	No Reaction		0	0	0	5
	Apparent Increased Pain		0	0	1	0
Pupil Response	Pupil Constricts		5	5	5	0
	No Constriction		0	0	0	0
	Miosis		0	0	0	5
	Mydriasis		0	0	0	0
Pinna	Ear Flattens Against Head		2	1	1	0
	Animal Shakes Head		3	4	4	5
	No Response		0	0	0	0
Proprioception	Normal: Returns Leg to Original Position		5	4	5	1
	Returns Leg Only Partially to Original Position		0	0	0	1
	No Response		0	1	0	3
Air Righting Reflex	Normal: Lands on All Four Feet		5	2	5	2
	Slightly Uncoordinated		0	3	0	2
	Lands on Side		0	0	0	0
	Lands on Back		0	0	0	1

Females	Neurobehavioral Positive Control Data: Functional Observational Battery Incidence Summary of Functional Observational Battery Evaluations	Appendix KK

Observer 6		**Group:**	**1**	**2**	**3**	**4**
Number of Animals Examined			5	5	5	5
Home Cage Evaluations						
Posture	Sitting or Standing Normally		4	1	0	0
	Alert, Oriented Toward Observer		1	1	5	0
	Asleep		0	0	0	0
	Lying on Side		0	1	0	0
	Flattened		0	2	0	5
	Crouched		0	0	0	0
Vocalizations	Not Present		5	5	5	5
	Present		0	0	0	0
Palpebral Closure	Eyelids Open		5	4	5	5
	Eyelids Completely Closed		0	0	0	0
	Eyelids Slightly Drooping		0	1	0	0
	Eyelids Half Closed		0	0	0	0
Handling Evaluations						
Ease of Removal	Very Easy		3	5	4	5
	Easy		1	0	1	0
	Moderately Difficult		0	0	0	0
	Freezes		0	0	0	0
	Difficult		0	0	0	0
Ease of Handling	Normal (easy, alert)		5	5	5	5
	Moderately Difficult		0	0	0	0
	Freezes		0	0	0	0
	Difficult		0	0	0	0
	Totally limp		0	0	0	0
Chromodacryorrhea	Not Present		5	5	5	5
	Present		0	0	0	0
Lacrimation	Not Present		5	1	5	3
	Moderate		0	1	0	1
	Extreme		0	3	0	1
Coat	Normal		5	5	5	5
	Slightly Soiled		0	0	0	0
	Moderately Soiled		0	0	0	0
	Extremely Soiled		0	0	0	0
Salivation	Not Present		5	5	5	2
	Slight		0	0	0	2
	Moderate		0	0	0	1
	Extreme		0	0	0	0

Females	Neurobehavioral Positive Control Data: Functional Observational Battery Incidence Summary of Functional Observational Battery Evaluations	Appendix KK

Observer 6		**Group:**	**1**	**2**	**3**	**4**
Number of Animals Examined			5	5	5	5
Open Field Evaluations						
Gait and Posture	Normal		5	1	5	0
	Ataxia		0	0	0	0
	Body Drags		0	1	0	3
	Limbs Splayed or Dragging		0	3	0	3
	Hunched Posture		0	1	0	0
Locomotion	Normal		5	1	0	0
	Increased Movement		0	0	3	0
	Decreased Movement		0	0	2	2
	None		0	4	0	3
Arousal	Normal		5	1	0	0
	Low, Slight Stupor		0	0	1	1
	Very Low, Stupor		0	4	0	4
	High, Slight Excitement, Tense		0	0	4	0
	Very High, Hyper-Alert		0	0	0	0
Piloerection	Not Present		5	5	5	5
	Present		0	0	0	0
Exophthalmia	Not Present		5	5	5	5
	Present		0	0	0	0
Feces	Number of Boluses		0	3	0	0
	Unformed Stool		0	0	0	0
Urine	Number of Pools		0	5	0	4
	Polyuria		0	0	0	0
Stereotypic Behavior						
Stereotypic Behavior	Not Present		5	5	0	3
	Present		0	0	5	2
Motor Movements						
Fasciculations	Not Present		5	5	5	0
	Slight		0	0	0	1
	Severe		0	0	0	4
Convulsions	Not Present		5	5	5	5
	Slight		0	0	0	0
	Severe		0	0	0	0
Tremors	Not Present		5	5	5	5
	Slight		0	0	0	0
	Severe		0	0	0	0

Females	Neurobehavioral Positive Control Data: Functional Observational Battery Incidence Summary of Functional Observational Battery Evaluations	Appendix KK

Observer 6		**Group:**	**1**	**2**	**3**	**4**
Number of Animals Examined			5	5	5	5
Reflex Assessments						
Approach Response	Normal: Slowly Approaches, Sniffs and/or Turns Away		5	2	1	3
	No Reaction		0	3	4	2
	Freezes or Pulls Away Slightly		0	0	0	0
	Jumps or Turns Abruptly to Avoid, or attacks and/or bites		0	0	0	0
Audition	Normal: Flinches or Flicks Ears		5	3	5	5
	No Reaction		0	2	0	0
	Exaggerated; Jumps, Flips, Bites		0	0	0	0
Pain	Normal: Turns/Bites or Walks Forward/Away		5	5	5	4
	No Reaction		0	0	0	1
	Apparent Increased Pain		0	0	0	0
Pupil Response	Pupil Constricts		5	5	5	0
	No Constriction		0	0	0	0
	Miosis		0	0	0	5
	Mydriasis		0	0	0	0
Pinna	Ear Flattens Against Head		0	0	2	0
	Animal Shakes Head		5	5	3	5
	No Response		0	0	0	0
Proprioception	Normal: Returns Leg to Original Position		5	3	5	3
	Returns Leg Only Partially to Original Position		0	1	0	1
	No Response		0	1	0	1
Air Righting Reflex	Normal: Lands on All Four Feet		5	3	5	0
	Slightly Uncoordinated		0	2	0	2
	Lands on Side		0	0	0	3
	Lands on Back		0	0	0	0

Females	Neurobehavioral Positive Control Data: Functional Observational Battery Incidence Summary of Functional Observational Battery Evaluations	Appendix KK

Observer 7		**Group:**	**1**	**2**	**3**	**4**
Number of Animals Examined			5	5	5	5
Home Cage Evaluations						
Posture	Sitting or Standing Normally		2	3	1	3
	Alert, Oriented Toward Observer		3	0	4	1
	Asleep		0	0	0	0
	Lying on Side		0	0	0	0
	Flattened		0	2	0	1
	Crouched		0	0	0	0
Vocalizations	Not Present		5	5	5	5
	Present		0	0	0	0
Palpebral Closure	Eyelids Open		5	3	5	5
	Eyelids Completely Closed		0	0	0	0
	Eyelids Slightly Drooping		0	2	0	0
	Eyelids Half Closed		0	0	0	0
Handling Evaluations						
Ease of Removal	Very Easy		5	5	4	5
	Easy		0	0	1	0
	Moderately Difficult		0	0	0	0
	Freezes		0	0	0	0
	Difficult		0	0	0	0
Ease of Handling	Normal (easy, alert)		5	5	4	5
	Moderately Difficult		0	0	1	0
	Freezes		0	0	0	0
	Difficult		0	0	0	0
	Totally limp		0	0	0	0
Chromodacryorrhea	Not Present		5	4	5	5
	Present		0	1	0	0
Lacrimation	Not Present		5	2	5	5
	Moderate		0	1	0	0
	Extreme		0	2	0	0
Coat	Normal		5	5	5	5
	Slightly Soiled		0	0	0	0
	Moderately Soiled		0	0	0	0
	Extremely Soiled		0	0	0	0
Salivation	Not Present		4	5	5	1
	Slight		1	0	0	3
	Moderate		0	0	0	1
	Extreme		0	0	0	0

Females	Neurobehavioral Positive Control Data: Functional Observational Battery Incidence Summary of Functional Observational Battery Evaluations	Appendix KK

Observer 7		**Group:**	**1**	**2**	**3**	**4**
Number of Animals Examined			5	5	5	5
Open Field Evaluations						
Gait and Posture	Normal		5	1	5	0
	Ataxia		0	0	0	2
	Body Drags		0	2	0	1
	Limbs Splayed or Dragging		0	2	0	1
	Hunched Posture		0	0	0	1
Locomotion	Normal		2	0	0	0
	Increased Movement		1	0	5	0
	Decreased Movement		2	1	0	5
	None		0	4	0	0
Arousal	Normal		3	0	0	0
	Low, Slight Stupor		2	2	0	3
	Very Low, Stupor		0	3	0	2
	High, Slight Excitement, Tense		0	0	5	0
	Very High, Hyper-Alert		0	0	0	0
Piloerection	Not Present		5	5	5	5
	Present		0	0	0	0
Exophthalmia	Not Present		5	5	5	5
	Present		0	0	0	0
Feces	Number of Boluses		0	8	0	0
	Unformed Stool		0	0	0	0
Urine	Number of Pools		0	4	1	4
	Polyuria		0	0	0	0
Stereotypic Behavior						
Stereotypic Behavior	Not Present		5	5	0	1
	Present		0	0	5	4
Motor Movements						
Fasciculations	Not Present		5	5	5	0
	Slight		0	0	0	5
	Severe		0	0	0	0
Convulsions	Not Present		5	5	5	5
	Slight		0	0	0	0
	Severe		0	0	0	0
Tremors	Not Present		5	5	5	5
	Slight		0	0	0	0
	Severe		0	0	0	0

Females	Neurobehavioral Positive Control Data: Functional Observational Battery Incidence Summary of Functional Observational Battery Evaluations	Appendix KK

Observer 7		**Group:**	**1**	**2**	**3**	**4**
Number of Animals Examined			5	5	5	5
Reflex Assessments						
Approach Response	Normal: Slowly Approaches, Sniffs and/or Turns Away		3	0	4	3
	No Reaction		2	5	1	2
	Freezes or Pulls Away Slightly		0	0	0	0
	Jumps or Turns Abruptly to Avoid, or attacks and/or bites		0	0	0	0
Audition	Normal: Flinches or Flicks Ears		5	3	5	5
	No Reaction		0	2	0	0
	Exaggerated; Jumps, Flips, Bites		0	0	0	0
Pain	Normal: Turns/Bites or Walks Forward/Away		5	5	5	4
	No Reaction		0	0	0	1
	Apparent Increased Pain		0	0	0	0
Pupil Response	Pupil Constricts		5	4	5	0
	No Constriction		0	1	0	0
	Miosis		0	0	0	5
	Mydriasis		0	0	0	0
Pinna	Ear Flattens Against Head		3	0	4	0
	Animal Shakes Head		2	5	1	5
	No Response		0	0	0	0
Proprioception	Normal: Returns Leg to Original Position		5	4	5	5
	Returns Leg Only Partially to Original Position		0	1	0	0
	No Response		0	0	0	0
Air Righting Reflex	Normal: Lands on All Four Feet		4	5	4	1
	Slightly Uncoordinated		1	0	1	2
	Lands on Side		0	0	0	2
	Lands on Back		0	0	0	0

Females	Neurobehavioral Positive Control Data: Functional Observational Battery Incidence Summary of Functional Observational Battery Evaluations	Appendix KK

Observer 8		**Group:**	**1**	**2**	**3**	**4**
Number of Animals Examined			5	5	5	5
Home Cage Evaluations						
Posture	Sitting or Standing Normally		0	4	0	3
	Alert, Oriented Toward Observer		4	0	4	1
	Asleep		1	0	0	0
	Lying on Side		0	0	0	0
	Flattened		0	1	0	1
	Crouched		0	0	0	0
Vocalizations	Not Present		5	5	5	5
	Present		0	0	0	0
Palpebral Closure	Eyelids Open		4	1	5	5
	Eyelids Completely Closed		1	0	0	0
	Eyelids Slightly Drooping		0	4	0	0
	Eyelids Half Closed		0	0	0	0
Handling Evaluations						
Ease of Removal	Very Easy		3	4	4	3
	Easy		2	1	1	2
	Moderately Difficult		0	0	0	0
	Freezes		0	0	0	0
	Difficult		0	0	0	0
Ease of Handling	Normal (easy, alert)		4	5	5	5
	Moderately Difficult		1	0	0	0
	Freezes		0	0	0	0
	Difficult		0	0	0	0
	Totally limp		0	0	0	0
Chromodacryorrhea	Not Present		5	4	5	5
	Present		0	1	0	0
Lacrimation	Not Present		5	2	5	5
	Moderate		0	2	0	0
	Extreme		0	1	0	0
Coat	Normal		5	5	5	5
	Slightly Soiled		0	0	0	0
	Moderately Soiled		0	0	0	0
	Extremely Soiled		0	0	0	0
Salivation	Not Present		5	5	5	4
	Slight		0	0	0	1
	Moderate		0	0	0	0
	Extreme		0	0	0	0

Females	Neurobehavioral Positive Control Data: Functional Observational Battery Incidence Summary of Functional Observational Battery Evaluations	Appendix KK

Observer 8		**Group:**	**1**	**2**	**3**	**4**
Number of Animals Examined			5	5	5	5
Open Field Evaluations						
Gait and Posture	Normal		5	1	5	4
	Ataxia		0	0	0	0
	Body Drags		0	3	0	1
	Limbs Splayed or Dragging		0	2	0	0
	Hunched Posture		0	0	0	0
Locomotion	Normal		5	0	1	4
	Increased Movement		0	0	4	0
	Decreased Movement		0	4	0	1
	None		0	1	0	0
Arousal	Normal		5	0	1	4
	Low, Slight Stupor		0	1	0	1
	Very Low, Stupor		0	4	0	0
	High, Slight Excitement, Tense		0	0	4	0
	Very High, Hyper-Alert		0	0	0	0
Piloerection	Not Present		5	5	5	5
	Present		0	0	0	0
Exophthalmia	Not Present		5	5	5	5
	Present		0	0	0	0
Feces	Number of Boluses		0	4	0	0
	Unformed Stool		0	0	0	0
Urine	Number of Pools		0	0	0	1
	Polyuria		0	0	0	0
Stereotypic Behavior						
Stereotypic Behavior	Not Present		5	5	1	4
	Present		0	0	4	1
Motor Movements						
Fasciculations	Not Present		5	5	5	4
	Slight		0	0	0	1
	Severe		0	0	0	0
Convulsions	Not Present		5	5	5	5
	Slight		0	0	0	0
	Severe		0	0	0	0
Tremors	Not Present		5	5	5	5
	Slight		0	0	0	0
	Severe		0	0	0	0

Females	Neurobehavioral Positive Control Data: Functional Observational Battery Incidence Summary of Functional Observational Battery Evaluations	Appendix KK

Observer 8		**Group:**	**1**	**2**	**3**	**4**
Number of Animals Examined			5	5	5	5
Reflex Assessments						
Approach Response	Normal: Slowly Approaches, Sniffs and/or Turns Away		5	3	5	5
	No Reaction		0	2	0	0
	Freezes or Pulls Away Slightly		0	0	0	0
	Jumps or Turns Abruptly to Avoid, or attacks and/or bites		0	0	0	0
Audition	Normal: Flinches or Flicks Ears		5	3	5	5
	No Reaction		0	2	0	0
	Exaggerated; Jumps, Flips, Bites		0	0	0	0
Pain	Normal: Turns/Bites or Walks Forward/Away		5	4	5	5
	No Reaction		0	1	0	0
	Apparent Increased Pain		0	0	0	0
Pupil Response	Pupil Constricts		5	3	4	2
	No Constriction		0	2	0	1
	Miosis		0	0	0	2
	Mydriasis		0	0	1	0
Pinna	Ear Flattens Against Head		0	1	1	0
	Animal Shakes Head		5	4	4	5
	No Response		0	0	0	0
Proprioception	Normal: Returns Leg to Original Position		5	5	5	5
	Returns Leg Only Partially to Original Position		0	0	0	0
	No Response		0	0	0	0
Air Righting Reflex	Normal: Lands on All Four Feet		5	5	5	4
	Slightly Uncoordinated		0	0	0	0
	Lands on Side		0	0	0	1
	Lands on Back		0	0	0	0

Females	Neurobehavioral Positive Control Data: Functional Observational Battery Incidence Summary of Functional Observational Battery Evaluations	Appendix KK

Observer 9		**Group:**	**1**	**2**	**3**	**4**
Number of Animals Examined			5	5	5	5
Home Cage Evaluations						
Posture	Sitting or Standing Normally		4	1	4	0
	Alert, Oriented Toward Observer		1	0	1	0
	Asleep		0	0	0	0
	Lying on Side		0	0	0	0
	Flattened		0	4	0	5
	Crouched		0	0	0	0
Vocalizations	Not Present		5	5	5	5
	Present		0	0	0	0
Palpebral Closure	Eyelids Open		5	1	5	5
	Eyelids Completely Closed		0	0	0	0
	Eyelids Slightly Drooping		0	4	0	0
	Eyelids Half Closed		0	0	0	0
Handling Evaluations						
Ease of Removal	Very Easy		3	4	4	4
	Easy		2	1	1	1
	Moderately Difficult		0	0	0	0
	Freezes		0	0	0	0
	Difficult		0	0	0	0
Ease of Handling	Normal (easy, alert)		5	5	5	5
	Moderately Difficult		0	0	0	0
	Freezes		0	0	0	0
	Difficult		0	0	0	0
	Totally limp		0	0	0	0
Chromodacryorrhea	Not Present		5	4	5	5
	Present		0	1	0	0
Lacrimation	Not Present		5	1	5	3
	Moderate		0	2	0	2
	Extreme		0	2	0	0
Coat	Normal		5	5	4	2
	Slightly Soiled		0	0	1	3
	Moderately Soiled		0	0	0	0
	Extremely Soiled		0	0	0	0
Salivation	Not Present		5	5	5	3
	Slight		0	0	0	2
	Moderate		0	0	0	0
	Extreme		0	0	0	0

Females	Neurobehavioral Positive Control Data: Functional Observational Battery Incidence Summary of Functional Observational Battery Evaluations	Appendix KK

Observer 9		**Group:**	**1**	**2**	**3**	**4**
Number of Animals Examined			5	5	5	5
Open Field Evaluations						
Gait and Posture	Normal		5	1	5	0
	Ataxia		0	0	0	2
	Body Drags		0	2	0	3
	Limbs Splayed or Dragging		0	3	0	1
	Hunched Posture		0	0	0	0
Locomotion	Normal		3	0	1	0
	Increased Movement		0	0	4	0
	Decreased Movement		2	1	0	3
	None		0	4	0	2
Arousal	Normal		3	0	0	0
	Low, Slight Stupor		2	1	0	0
	Very Low, Stupor		0	4	0	5
	High, Slight Excitement, Tense		0	0	5	0
	Very High, Hyper-Alert		0	0	0	0
Piloerection	Not Present		5	5	5	5
	Present		0	0	0	0
Exophthalmia	Not Present		5	5	5	5
	Present		0	0	0	0
Feces	Number of Boluses		0	3	0	0
	Unformed Stool		0	0	0	0
Urine	Number of Pools		0	2	0	0
	Polyuria		0	0	0	0
Stereotypic Behavior						
Stereotypic Behavior	Not Present		5	5	0	0
	Present		0	0	5	5
Motor Movements						
Fasciculations	Not Present		5	5	5	0
	Slight		0	0	0	3
	Severe		0	0	0	2
Convulsions	Not Present		5	5	5	5
	Slight		0	0	0	0
	Severe		0	0	0	0
Tremors	Not Present		5	5	5	5
	Slight		0	0	0	0
	Severe		0	0	0	0

Females	Neurobehavioral Positive Control Data: Functional Observational Battery Incidence Summary of Functional Observational Battery Evaluations	Appendix KK

Observer 9		**Group:**	**1**	**2**	**3**	**4**
Number of Animals Examined			5	5	5	5
Reflex Assessments						
Approach Response	Normal: Slowly Approaches, Sniffs and/or Turns Away		3	0	5	3
	No Reaction		2	5	0	2
	Freezes or Pulls Away Slightly		0	0	0	0
	Jumps or Turns Abruptly to Avoid, or attacks and/or bites		0	0	0	0
Audition	Normal: Flinches or Flicks Ears		5	1	5	3
	No Reaction		0	4	0	2
	Exaggerated; Jumps, Flips, Bites		0	0	0	0
Pain	Normal: Flinches or Flicks Ears		5	5	5	1
	No Reaction		0	0	0	4
	Exaggerated; Jumps, Flips, Bites		0	0	0	0
Pupil Response	Pupil Constricts		4	3	5	0
	No Constriction		1	1	0	0
	Miosis		0	1	0	5
	Mydriasis		0	0	0	0
Pinna	Ear Flattens Against Head		0	0	0	0
	Animal Shakes Head		5	5	5	5
	No Response		0	0	0	0
Proprioception	Normal: Returns Leg to Original Position		5	5	5	5
	Returns Leg Only Partially to Original Position		0	0	0	0
	No Response		0	0	0	0
Air Righting Reflex	Normal: Lands on All Four Feet		5	3	5	2
	Slightly Uncoordinated		0	1	0	2
	Lands on Side		0	1	0	1
	Lands on Back		0	0	0	0

	Neurobehavioral Positive Control Data: Motor Activity Preface	Appendix KK

This is an abridged version of text and tables from Study No. H-34, 00-14501 as amended on 23 December 2008.

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1. INTRODUCTION

This study was designed to assess the effect of Amphetamine and Chlorpromazine on the locomotor activity in young rats 13, 17, 21, and 62 days of age. This work was performed in order to provide Positive Control data and was conducted according to test guidelines of the U.S. Environmental Protection Agency (Office of Prevention, Pesticides and Toxic Substances, Health Effects Guidelines, OPPTS 870.6300, Developmental Neurotoxicity, August 1998).

2. MATERIALS AND METHODS

2.1. REGULATORY REFERENCES

2.1.1. TEST GUIDELINES

This study was designed to provide positive control data for neurotoxicity screening studies in accord with the US EPA Health Effects Test Guidelines, OPPTS 870.6200 Neurotoxicity Screening Battery, August 1998.

2.1.2. GOOD LABORATORY PRACTICES

This study was conducted in compliance with Part 160 of 40 CFR (EPA/FIFRA Good Laboratory Practice Regulations) with the exception that assays to verify concentration, stability and homogeneity of the test articles in carriers were not performed.

2.1.3. ANIMAL WELFARE ACT COMPLIANCE

This study complied with all appropriate parts of the Animal Welfare Act regulations: 9 CFR Parts 1 and 2 final Rules, Federal Register, Volume 54, No. 168, August 31, 1989, pp. 36112-36163 effective October 30, 1989 and 9 CFR Part 3 Animal Welfare Standards; Final Rule, Federal Register, Volume 56, No. 32, February 15, 1991, pp. 6426-6505 effective March 18, 1991.

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2.2. FACILITIES MANAGEMENT/ANIMAL HUSBANDRY

Currently acceptable practices of good animal husbandry were followed, e.g., *Guide for the Care and Use of Laboratory Animals*; National Academy Press, 1996. Huntingdon Life Sciences is fully accredited by the Association for Assessment and Accreditation of Laboratory Animal Care International (AAALAC).

2.3. STUDY MANAGEMENT

2.3.1. SPONSOR AND TESTING FACILITY

Huntingdon Life Sciences
Mettlers Road
PO Box 2360
East Millstone, NJ 08875-2360

2.3.2. STUDY DIRECTOR[1]

[redacted]

2.4. EXPERIMENTAL DESIGN

Group	Treatment	Dosage (mg/kg)	Dose Volume (mL/kg)	Treatment Schedule	Locomotor Activity Assessment	Number of Animals
I[a]	Control	0	5	Postnatal Day 13, 17, 21, 62	Approximately 30 minutes after injection	10/sex
II	Amphetamine	2.0	5	Postnatal Day 13, 17, 21, 62	Approximately 30 minutes after	10/sex

[redacted] served as Study Director during the testing portion of Study No. 00-14501. Effective 19 May 2000, [redacted] assumed the responsibilities of Study Director. [redacted] assumed all Study Director responsibilities following [redacted] departure from Huntingdon Life Sciences, effective 22 December 2000. Effective 10 Nov 2008, [redacted] assumed Study Director responsibilities for Study No. 00-14501 for the purpose of amending the Final Report only.

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					injection	
III	Chlorpromazine	10.0	5	Postnatal Day 13, 17, 21, 62	Approximately 30 minutes after injection	10/sex

[a]Control animals were administered 0.9% saline at the same dose volume as the test articles.

2.5. STUDY DATES

2.5.1. STUDY INITIATION

10 February 2000

2.5.2. DATE OF ANIMAL RECEIPT

11 February 2000

2.5.3. DOSE INITIATION DATES FOR LOCOMOTOR ACTIVITY ASSESSMENTS

Postnatal Day 13: 14 February 2000
Postnatal Day 17: 18 February 2000
Postnatal Day 21: 22 February 2000
Postnatal Day 62: 03 April 2000

2.5.4. TRANSFER OF ANIMALS TO EXTRA RAT COLONY

04 April 2000

2.5.5. STUDY COMPLETION

13 March 2001 (Date Study Director signed the Final Report)

2.6. TEST ARTICLES

2.6.1. AMPHETAMINE

Supplier

Sigma
3050 Spruce Strret

	Neurobehavioral Positive Control Data: Motor Activity	Appendix KK

St. Louis, MO 63103

Lot Number

69H1239

Purity

Assume 100%

Date Received

07 January 2000

Expiration Date

June 2001

Description

Powder

Storage

Room temperature

Archival Sample

A sample of amphetamine is stored in the Archives of the Testing Facility under conditions specified for test article storage.

Disposition of Unused Test Article

Unused test article was used as the archival sample for this test article.

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2.6.2. CHLORPROMAZINE

Supplier

Sigma
3050 Spruce Street
St. Louis, MO 63103

Lot Number

48H1403

Purity

98%

Date Received

01 December 1999

Expiration Date

April 2001

Description

White/White with a yellow cast, powder

Characteristics

Light sensitive

Storage

Room temperature, protected from light

Archival Sample

A sample of chlorpromazine is stored in the Archives of the Testing Facility under conditions specified for test article storage.

	Neurobehavioral Positive Control Data: Motor Activity	Appendix KK

Disposition of Unused Test Article

Unused test article was used as the archival sample for this test article.

2.7. CONTROL ARTICLE

0.9 % Saline

2.7.1. SUPPLIER

VWR Scientific Products
200 Center Square Rd.
Bridgeport, NJ 08014

2.7.2. LOT/BATCH NUMBER

G-949941 / 173-191

2.7.3. DATE RECEIVED

04 June 1999

2.7.4. EXPIRATION DATE

October 2000

2.7.5. DESCRIPTION

Clear liquid

2.7.6. STORAGE

Room temperature

2.7.7. ARCHIVAL SAMPLE

A sample of the control article is stored in the Archives of the Testing Facility under conditions specified for test article storage.

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2.8. TEST ARTICLE AND CONTROL ARTICLE PREPARATION

2.8.1. CONTROL ARTICLE PREPARATION

Control article was used neat; as received.

2.8.2. TEST ARTICLE PREPARATION

Appropriate amounts of test article were mixed with 0.9% saline to achieve the desired concentrations in a graduated cylinder, capped, inverted and shaken well prior to use. Fresh dosing solutions were prepared either 1 or 3 days prior to or the day of dose administration and were refrigerated (2-8°C) when not in use.

2.9. ANALYSIS OF DOSING SUSPENSIONS

Analyses were not performed in this study.

2.10. TEST ANIMALS

2.10.1. SPECIES

Albino Rats
[Crl: CD® (SD) IGS BR]

2.10.2. SUPPLIER

Charles River Laboratories
Kingston, NY facility

2.10.3. JUSTIFICATION FOR TEST SYSTEM SELECTION

The rat is a rodent animal model commonly utilized in reproduction studies as recommended in the referenced guidelines.

2.10.4. ANIMAL RECEIPT INFORMATION

Purchased	8 litters (dam and 5 pups/sex/litter)
Placed on study	6 litters (dam and 5/sex/litter)

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2.10.5. AGE OF PUPS AT RECEIPT

Pups were received on Postnatal Day 10.

2.10.6. ACCLIMATION PERIOD

All female rats and their litters were acclimated from the time they were received until locomotor activity assessment began on the pups.

2.11. SELECTION/GROUP ASSIGNMENT

More animals than required for the study were purchased and acclimated. Animals considered suitable for the study on the basis of pretest physical examinations were randomized into groups at receipt using a method which ranked the Postnatal Day 10 body weights and randomly assigned each within the block of three into groups. Animals were replaced as required based on physical examinations and/or body weight change up to Postnatal Day 13 to achieve the desired number of animals (10/sex/group). Disposition of all animals not utilized in this study is maintained in the study file.

2.12. ANIMAL IDENTIFICATION

Each female was ear tagged (metal ear tag) with a unique identification number by the supplier. Each Postnatal Day 10 pup was uniquely identified by tattoo upon receipt. At weaning (Postnatal Day 21), each pup was ear-tagged with a number assigned by the Testing Facility upon receipt. These numbers plus the study number served as each animal's unique and permanent identification for the duration of the study. Each cage was also provided with a cage card which contained the study number and animal number.

2.13. VETERINARY CARE

Animals were monitored by the technical staff for any conditions requiring possible veterinary care.

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2.14. ANIMAL HUSBANDRY

2.14.1. HOUSING

Each female rat and litter, from the time of receipt through Postnatal Day 20 were individually housed in a covered, clear plastic "shoebox" with bedding. From Postnatal Day 21 until Postnatal Day 28, the weanling pups (two or three of the same sex) were housed in stainless steel suspended cages with wire mesh floors and fronts. After Postnatal Day 28, and for the remainder of the study, animals were individually housed in stainless steel suspended cages with wire mesh floors. A glass food jar with a stainless steel lid, and food saver, was secured in each cage. Clean food jars and fresh feed were provided at least weekly.

2.14.2. FEED

Certified Rodent Diet, No. 5002; (Meal) (PMI Nutrition International, St. Louis, MO) was provided *ad libitum*.

Analytical certification of batches of feed, provided by the manufacturer, were maintained on file at the Testing Facility. Feed was analyzed for nutritional content (protein, fat, fiber), inorganic constituents (arsenic, cadmium, calcium, lead, mercury, phosphorus, selenium), organophosphates (diazinon, ethion, methyl parathion, thimet, trithion, disulfoton, malathion, parathion, thiodan), and pesticides (aldrin, beta-BHC, DDE, delta-BHC, endrin, heptachlor, lindane, mirex, alpha-BHC, chlordane, total DDT, dieldrin, HCB, heptachlor epoxide, methoxychlor), plus PCB, and aflatoxin.

There were no known contaminants in the feed which were considered capable of interfering with the results of this study.

2.14.3. WATER

Facility water was supplied by Elizabethtown Water Company, (Westfield, NJ); and was provided *ad libitum* to individual animal cages via an automated watering system.

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Monthly water analyses were conducted by Elizabethtown Water Company, Westfield, New Jersey (Raritan-East Millstone Plant) to ensure that water meets standards specified under the EPA Federal Safe Drinking Water Act Regulations (40 CFR part 141). Water analyses, provided by the supplier, were maintained on file at the Testing Facility. In addition, water samples were collected biannually from representative rooms in the Testing Facility; chemical and microbiological water analyses were conducted on these samples by a subcontract laboratory. Results were maintained on file at the Testing Facility. There are no known contaminants in the water which are expected to interfere with this study.

2.14.4. BEDDING ARTICLE

Ground corncob bedding (Bed-O'-Cobs® 1/4 inch Irradiated, The Andersons, Maumee, Ohio) was provided for each female rat and litter from time of receipt through Postnatal Day 20. Fresh bedding was provided weekly and as needed.

Bedding was analyzed for inorganic constituents (arsenic, bismuth, cadmium, lead, magnesium, manganese, mercury, nickel, zinc), organophosphates (diazinon, ethion, methyl parathion, trithion, malthion, ethyl parathion), and pestcides (aldrin, beta-BHC, DDE, delta-BHC, endrin, heptchlor, lindane, mirex, alpha-BHC, chlordane, total DDT, dieldrin, HCB, heptachlor epoxide, methoxychlor), plus PCB, and aflatoxin. There were no known contaminants in the bedding which were expected to interfere with the results of this study. Contaminant analyses were performed periodically. Results of the bedding analysis were maintained on file at the Testing Facility.

2.14.5. ENVIRONMENTAL CONDITIONS

Light/Dark Cycle

Twelve-hour light/dark cycle provided via automatic timer.

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Temperature

Temperature was monitored and recorded twice daily and maintained within the desired ranges to the maximum extent possible.

Desired: 18 - 26°C
Actual: 21 - 24°C

Relative Humidity

Relative humidity was monitored and recorded once daily and maintained within the desired ranges to the maximum extent possible.

Desired: 30 - 70%
Actual: 20 – 68%

Relative humidity was not within the specified range on eight occasions during this study (20-28%). This was not considered to have affected the integrity of the study.

2.15. TEST ARTICLE ADMINISTRATION

2.15.1. ROUTE OF ADMINISTRATION

Intraperitoneal injection

2.15.2. JUSTIFICATION FOR ROUTE OF ADMINISTRATION

The intraperitoneal route provides rapid test article absorption and has been used in previous studies with the test articles.

2.15.3. FREQUENCY AND DURATION OF ADMINISTRATION

The test articles (Amphetamine, Chlorpromazine) and control article were administered to pups on Postnatal Days 13, 17, 21, and 62. Each animal was dosed more than once per week with a washout period of 4 to 41 days between doses.

	Neurobehavioral Positive Control Data: Motor Activity	Appendix KK

2.15.4. ADMINISTRATION OF TEST AND/OR CONTROL ARTICLE

The test articles (Amphetamine, Chlorpromazine) and the control article (saline) were administered by intraperitoneal injection into the abdominal cavity near the inguinal region using a sterile needle and syringe of appropriate size. Doses were calculated using the most recent body weights available. A volume of 5 mL/kg of body weight was administered.

2.16. EXPERIMENTAL EVALUATION

2.16.1. VIABILITY OBSERVATIONS (CAGESIDE)

Observations for mortality, morbidity and signs of severe toxic or pharmacological effects were made at least twice daily (morning and afternoon) for the female rats and pups.

2.16.2. CLINICAL OBSERVATIONS

A detailed physical examination was given to all female rats and pups upon receipt. The rat pups had a detailed physical examination on the day of locomotor activity behavioral assessment and weekly during the postweaning period until they were placed in a colony.

2.16.3. BODY WEIGHTS

Body weights were recorded for pups on Postnatal Days 10, 13, 17, 21, 62, and weekly during the postweaning period.

2.17. LITTER EVALUATIONS

2.17.1. OBSERVATIONS

Litters were observed and each pup was sexed at the time of receipt. Pups in the litter were counted on Postnatal Days 10,13,17, and 21.

	Neurobehavioral Positive Control Data: Motor Activity	Appendix KK

2.17.2. WEANING

Pups were weaned on Postnatal Day 21 and housed two or three of the same sex per cage.

2.17.3. LOCOMOTOR ACTIVITY BEHAVIORAL ASSESSMENT

The locomotor activity assessment was measured in 10 pups/sex/group on Postnatal Days 13, 17, 21 and 62. On each day of testing, 10 rat pups/sex/group were adminstered either vehicle, amphetamine, or chlorpromazine. Approximately thirty minutes after the injection they were placed in a clear plastic shoebox cage equipped with a 5-beam automated Photobeam Activity System (PAS; San Diego Instruments, Inc.). Activity was monitored during a 60-minute session composed of 12, five-minute intervals. A record was made of the total number of photobeam breaks which occurred during each of the 12, five-minute intervals. The locomotor activity was assessed using a repeated measures analysis of variance to determine if there was a test article effect. Rat pups were randomized so that there was an equal representation of the treatment groups during each locomotor activity session.

Temperature

Temperature was monitored and recorded twice daily, just prior to the first evaluation and just after the last evaluation.

Desired: 18 to 26°C
Actual: 22 to 24°C

Relative Humidity

Relative humidity was monitored and recorded twice daily, just prior to the first evaluation and just after the last evaluation.

Desired: 30 to 70%
Actual: 29 to 56%

	Neurobehavioral Positive Control Data: Motor Activity	Appendix KK

Noise Level

Noise level was monitored using a Digital Sound Level Meter, Model 840029 (Sper Scientific, Ltd., Scottsdale, Arizona) and recorded twice daily, just prior to the first evaluation and just after the last evaluation.

Desired: 55 to 65 dB
Actual: 60.1 to 61.4 dB

Illumination

Illumination was monitored using a Photometer 1 (Quantum Instruments, Inc., Garden City, New York) and recorded twice daily, just prior to the first evaluation and just after the last evaluation.

Desired: <80 footcandles
Actual: 36.5 to 55.3 footcandles

2.18. POSTMORTEM

No postmortem examinations were performed as all animals were transferred to the in-house rat colony.

2.19. DISPOSITION OF ANIMALS

After the pups were weaned, the female rats were euthanized via an overdose of carbon dioxide and discarded. After the locomotor activity behavioral assessment on 62, the rats were transferred to the in-house rat colony.

2.20. PRESERVATION OF RECORDS AND SPECIMENS

All data documenting experimental details and study procedures and observations were recorded and maintained as raw data.

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At the completion of the study, all reports, raw data, protocol and amendments, and retained samples will be maintained in the Testing Facility's Archives.

2.21. PROTOCOL DEVIATIONS

The following protocol deviations occurred during the study, but were not considered to have compromised the validity or integrity of the study.

1. Litter counts were not recorded on Postnatal Days 10, 13, 17, and 21 due to technician error. However, individual body weights recorded for those days (Postnatal Days 10, 13, 17, and 21) are considered documentation for the count.

2. Documentation of pups not selected for this study was omitted from the data due to technician error.

3. As there is no documentation in the study data indicating the age of the dams at time of receipt at the Testing Facility, it can not be determined that the protocol requirement that the dams be 75-90 days old was met.

4. Protocol specified that the washout period between doses would be approximately 2 days even though it also specified dosing would occur on Postnatal Days 13, 17, 21 and 60 (±2) days. The washout periods in this study ranged from 4 to 41 days.

5. Fresh dosing solutions were prepared either 1 or 3 days prior to or the day of dose administration rather than once weekly as specified in the protocol.

2.22. COMPUTER SYSTEM

The Toxicology Analysis System Customized - Reproduction Module (TASC-R), version 1.1.13, from Pathologist Associates International (PAI), Frederick, Maryland, was the computer software system utilized during the conduct of this study for randomizations, data collection, reporting, and statistical analysis.

	Neurobehavioral Positive Control Data: Motor Activity	Appendix KK

2.23. STATISTICAL EVALUATIONS

The locomotor activity behavioral assessments were analyzed for each period using split-plot repeated measures analysis of variance with model terms for group, animal within group, interval and group by interval interaction. If the group by treatment interaction was statistically significant, indicating non-parallelism in the behavioral profile between groups, a separate one-way ANOVA for group effects was performed at each interval. If the response data passed on the parallel hypothesis, an ANOVA (using summed responses over intervals for each animal) was used to test for the overall treatment effect with respect to the level hypothesis. If any significant overall treatment group effect was found by any of the above ANOVAs, Dunnett's t-test was used to find groups that differed from control. No investigation of model fit was requested or performed. Analyses were performed for sexes separately and combined. Treatment group effects were deemed significant at the α=0.05 level. Plots, tables, listings, and analyses were generated using SAS® version 6.12 for WINDOWS. Analyses were conducted by CATO Research, 200 Westpark Corporate Center, 4364 South Alston Avenue, Durham, NC 27713-2280.

3. RESULTS

Results from pups treated with 2 mg/kg Amphetamine (Group II) indicate a statistically significant increase in locomotor activity for male and female rats combined, on Postnatal Days 13, 17, 21, and 62, when compared to the control group. Statistically significant increases in locomotor activity were observed for Group II male and female rats individually, on Postnatal Day 21 and 62 only.

Results from pups treated with 10 mg/kg Chlorpromazine (Group III) indicated a statistically significant decrease in locomotor activity for male and female rats combined, on Postnatal Days 17, 21, and 62, when compared to the control group. Statistically significant decreases in locomotor activity were observed for Group III male and female rats individually, on Postnatal Days 17, 21, and 62 only.

	Neurobehavioral Positive Control Data: Motor Activity	Appendix KK

4. DISCUSSION

This study evaluated the behavioral effects of Amphetamine and Chlorpromazine on locomotor activity of young male and female rats, in order to generate positive control data for future developmental neurotoxicity studies.

Rats dosed and tested on Postnatal Day 17, 21, and 62 responded to test article treatment, with increased activity for Group II (2 mg/kg amphetamine) and decreased activity for Group III (10 mg/kg chlorpromazine). Amphetamine or Chlorpromazine behavioral effects were observed equally in both male and female rats in the treatment groups.

Rats treated with Amphetamine exhibited locomotor activity similar to control levels at the beginning of the testing period. Unlike the control animals, the Amphetamine treated animals did not habituate, and remained in a more active state for the duration of the 60-minute testing period.

Rats treated with Chlorpromazine exhibited decreased locomotor activity compared to control levels at the beginning of the testing period. Unlike the control animals, the Chlorpromazine treated animals did not habituate, and remained in a less active state for the duration of the 60-minute testing period.

The pups dosed and tested on Postnatal Day 13 did not respond to treatment as dramatically as in latter dosing/testing days. The lack of statistically significant locomotor activity differences in the Postnatal Day 13 treatment groups may stem from the low basal level of activity in pups of such a young age. The presence of age-related differences in locomotor activity in this study suggests the importance of evaluating behavioral endpoints at several different time-points, when testing for developmental neurotoxicity.

5. CONCLUSION

Under the conditions of this study, 2 mg/kg of Amphetamine or 10 mg/kg of Chlorpromazine, administered to young male and female rats on Postnatal Days 13, 17, 21, and 62, via intraperitoneal injection produced statistically significant behavioral effects on locomotor activity. Based on these results, it was shown that both amphetamine and chlorpromazine are excellent model compounds for the generation of locomotor activity alterations in young Sprague Dawley rats.

	Neurobehavioral Positive Control Data: Motor Activity Mean Motor Activity Values Preface	Appendix KK

Summary of Statistical Results for Motor Activity Data

Post Natal Day	Sex	Parallel Hypothesis (p-value)	Level Hypothesis (p-value)	Significant Pairwise Results*
13	Male	0.1824	0.3593	NA
	Female	0.1097	0.0723	NA
	Combined	0.0074	NA	**1**:NS; **2**:NS;**10**:II>I; **11**:II>I; **12**:II>I
17	Male	0.0203	NA	**1**:I>III; **2**:I>III; **4**:I>III
	Female	0.0001	NA	**1**:I>III; **2**:I>III; **3**:I>III; **4**:NS; **5**:I>III
	Combined	0.0001	NA	**1**:I>III; **2**:I>III; **3**:I>III; **4**:I>III; **5**:I>III; **8**:NS; **10**:NS; **11**:NS; **12**:II>I
21	Male	0.0001	NA	**1**:II>I, I>III; **2**:II>I, I>III; **3**:II>I, I>III; **4**:II>I; **5**:II>I; **6**:II>I; **7**:II>I; **8**:II>I; **9**:II>I; **10**:II>I; **11**:II>I; **12**:II>I
	Female	0.0001	NA	**1**:II>I, I>III; **2**:II>I, I>III; **3**:II>I, I>III; **4**:II>I; **5**:II>I; **6**:II>I; **7**:II>I; **8**:II>I; **9**:II>I; **10**:II>I; **11**:II>I; **12**:II>I
	Combined	0.0001	NA	**1**:II>I, I>III; **2**:II>I, I>III; **3**:II>I, I>III; **4**:II>I; **5**:II>I; **6**:II>I, I>III; **7**:II>I; **8**:II>I; **9**:II>I; **10**:II>I; **11**:II>I; **12**:II>I
62	Male	0.0001	NA	**1**:I>III; **2**:I>III; **3**:I>III; **4**:I>III; **5**:I>III; **6**:II>I, I>III; **7**:II>I, I>III; **8**:II>I, I>III; **9**:II>I, I>III; **10**:II>I, I>III; **11**:II>I; **12**:II>I
	Female	0.0001	NA	**1**:I>III; **2**:I>III; **3**:I>III; **4**:I>III; **5**:II>I, I>III; **6**:II>I, I>III; **7**:I>III; **8**:II>I, I>III; **9**:II>I, I>III; **10**:II>I, I>III; **11**:II>I; **12**:II>I, I>III
	Combined	0.0001	NA	**1**:I>III; **2**:I>III; **3**:I>III; **4**:I>III; **5**:II>I, I>III; **6**:II>I, I>III; **7**:II>I, I>III; **8**:II>I, I>III; **9**:II>I, I>III; **10**:II>I, I>III; **11**:II>I, I>III; **12**:II>I, I>III

*Only intervals with significant differences between treatments are reported.

NA = Not applicable; NS = No significant differences from control

x: a>b indicates mean for group a significantly greater than mean for group b in interval x.

I = control, II = amphetamine, III = chlorpromazine

Males	Neurobehavioral Positive Control Data: Motor Activity Mean Motor Activity Values Postnatal Day 13	Appendix KK

	Interval											
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
Group I – Control												
Mean	27.70	12.30	18.40	23.60	10.60	14.10	12.90	7.40	7.10	9.40	8.80	9.90
S.D.	21.88	15.32	30.96	40.81	12.43	20.80	12.81	10.24	11.32	10.15	7.18	11.90
N	10	10	10	10	10	10	10	10	10	10	10	10
Group II – 2.0 mg/kg Amphetamine												
Mean	37.70	21.10	18.40	17.20	10.20	9.20	6.10	8.10	19.60	36.70	28.80	41.60
S.D.	39.38	25.14	29.86	25.17	14.29	11.15	8.48	9.05	20.01	43.02	39.89	58.17
N	10	10	10	10	10	10	10	10	10	10	10	10
Group III – 10.0 mg/kg Chlorpromazine												
Mean	14.80	8.10	8.80	12.30	7.40	5.70	8.20	25.70	12.80	12.00	8.60	17.70
S.D.	26.95	15.17	13.21	21.67	11.84	13.05	11.38	55.13	22.52	27.05	27.20	54.93
N	10	10	10	10	10	10	10	10	10	10	10	10

Females	Neurobehavioral Positive Control Data: Motor Activity Mean Motor Activity Values Postnatal Day 13	Appendix KK

	Interval											
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
Group I – Control												
Mean	25.00	14.70	17.10	20.90	16.60	14.30	9.70	6.20	12.50	10.00	7.60	5.70
S.D.	32.00	17.81	24.47	19.77	19.29	14.19	11.61	8.98	13.82	10.72	11.35	4.27
N	10	10	10	10	10	10	10	10	10	10	10	10
Group II – 2.0 mg/kg Amphetamine												
Mean	36.30	19.40	29.10	24.00	30.40	26.40	41.30	33.20	38.90	52.00	49.90	31.90
S.D.	45.41	26.53	40.16	34.50	51.56	49.40	65.11	55.36	74.84	87.22	55.36	38.23
N	10	10	10	10	10	10	10	10	10	10	10	10
Group III – 10.0 mg/kg Chlorpromazine												
Mean	4.00	1.50	11.40	24.30	0.80	2.50	3.50	4.90	3.10	5.10	6.20	1.90
S.D.	8.07	3.75	19.41	50.71	1.62	4.06	5.76	9.34	5.51	10.79	10.25	2.88
N	10	10	10	10	10	10	10	10	10	10	10	10

Males	Neurobehavioral Positive Control Data: Motor Activity Mean Motor Activity Values Postnatal Day 17	Appendix KK

	Interval											
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**0**	**11**	**12**
Group I – Control												
Mean	75.00	55.80	49.40	50.90	36.30	36.00	39.10	35.20	32.00	31.00	33.20	14.50
S.D.	42.95	49.40	33.92	40.33	35.24	38.39	43.53	32.15	39.34	39.73	39.81	18.33
N	10	10	10	10	10	10	10	10	10	10	10	10
Group II – 2.0 mg/kg Amphetamine												
Mean	52.00	30.80	42.70	41.20	29.90	26.50	32.40	52.40	64.10	62.00	51.60	28.80
S.D.	45.11	34.37	45.49	30.49	26.91	30.95	34.10	46.85	69.09	59.57	55.35	29.13
N	10	10	10	10	10	10	10	10	10	10	10	10
Group III – 10.0 mg/kg Chlorpromazine												
Mean	13.10	10.80	12.30	8.20	13.40	9.20	10.30	18.30	10.70	17.30	10.60	11.60
S.D.	29.41	24.51	22.45	18.00	25.18	16.30	15.91	18.29	19.24	27.38	13.85	14.45
N	10	10	10	10	10	10	10	10	10	10	10	10

Females	Neurobehavioral Positive Control Data: Motor Activity Mean Motor Activity Values Postnatal Day 17	Appendix KK

	Interval											
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
Group I – Control												
Mean	99.10	39.90	34.00	22.70	30.20	16.30	24.60	32.10	30.70	25.60	27.70	14.50
S.D.	37.91	43.36	30.81	43.34	36.66	25.23	29.95	42.49	36.06	39.64	39.21	22.14
N	10	10	10	10	10	10	10	10	10	10	10	10
Group II – 2.0 mg/kg Amphetamine												
Mean	85.20	47.40	30.20	47.40	34.00	15.80	17.50	18.40	26.50	33.60	19.10	34.40
S.D.	35.75	31.80	26.19	26.08	24.68	13.77	19.73	23.20	21.84	31.32	22.29	26.34
N	10	10	10	10	10	10	10	10	10	10	10	10
Group III – 10.0 mg/kg Chlorpromazine												
Mean	2.20	4.80	1.00	0.90	2.70	17.70	14.20	3.70	23.60	4.80	6.10	12.60
S.D.	3.16	6.09	2.31	2.51	6.96	52.49	37.67	5.85	46.08	9.17	18.94	28.88
N	10	10	10	10	10	10	10	10	10	10	10	10

Males	Neurobehavioral Positive Control Data: Motor Activity Mean Motor Activity Values Postnatal Day 21	Appendix KK

	Interval											
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
Group I – Control												
Mean	73.60	50.10	25.30	17.10	16.50	28.50	25.70	14.60	27.00	16.10	7.90	8.80
S.D.	46.33	35.63	29.06	26.53	20.99	28.32	23.84	21.48	25.73	18.54	10.16	10.77
N	10	10	10	10	10	10	10	10	10	10	10	10
Group II – 2.0 mg/kg Amphetamine												
Mean	157.30	154.00	144.00	152.60	141.50	141.20	127.50	136.70	133.80	127.10	125.00	113.20
S.D.	30.36	22.58	9.13	36.00	25.08	28.27	27.20	26.42	28.39	23.50	31.85	25.57
N	10	10	10	10	10	10	10	10	10	10	10	10
Group III – 10.0 mg/kg Chlorpromazine												
Mean	14.20	6.90	0.70	2.60	5.10	4.50	4.20	11.50	8.60	10.50	5.20	5.20
S.D.	18.40	12.31	1.49	8.22	7.69	7.68	7.28	17.28	10.48	14.39	10.81	7.13
N	10	10	10	10	10	10	10	10	10	10	10	10

Females	Neurobehavioral Positive Control Data: Motor Activity Mean Motor Activity Values Postnatal Day 21	Appendix KK

	Interval											
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
Group I – Control												
Mean	93.30	29.80	27.50	17.50	17.80	27.10	15.10	14.50	8.70	7.80	8.80	10.40
S.D.	51.26	23.93	20.88	25.10	29.56	30.45	23.90	20.60	14.43	12.41	17.87	21.70
N	10	10	10	10	10	10	10	10	10	10	10	10
Group II – 2.0 mg/kg Amphetamine												
Mean	149.10	133.50	114.30	118.80	118.40	116.60	108.60	104.90	113.20	111.30	108.00	95.00
S.D.	27.65	29.30	18.88	27.45	32.05	33.02	36.06	30.71	20.07	22.88	27.81	22.40
N	10	10	10	10	10	10	10	10	10	10	10	10
Group III – 10.0 mg/kg Chlorpromazine												
Mean	8.00	3.40	3.20	4.70	4.40	5.60	5.00	10.80	4.60	5.20	5.90	8.00
S.D.	11.19	6.92	4.78	5.72	7.79	7.73	12.27	12.46	7.44	12.89	12.75	9.43
N	10	10	10	10	10	10	10	10	10	10	10	10

Males	Neurobehavioral Positive Control Data: Motor Activity Mean Motor Activity Values Postnatal Day 62	Appendix KK

	Interval											
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
Group I – Control												
Mean	233.1	211.1	182.2	156.5	157.3	120.3	82.4	80.1	65.4	51.3	44.2	18.3
S.D.	49.84	31.37	18.05	28.60	35.20	50.12	53.69	57.66	63.58	56.90	52.93	23.21
N	10	10	10	10	10	10	10	10	10	10	10	10
Group II – 2.0 mg/kg Amphetamine												
Mean	242.5	228.8	190.8	190.5	185.6	163.8	165	169.4	160.5	155.7	142.5	133.2
S.D.	61.10	44.69	47.22	55.66	32.24	41.13	48.15	53.80	49.25	35.92	38.54	42.49
N	10	10	10	10	10	10	10	10	10	10	10	10
Group III – 10.0 mg/kg Chlorpromazine												
Mean	28.8	31.3	26.4	20.3	16.8	19.7	10.6	9.1	5.9	7.4	6.3	4.2
S.D.	69.09	63.0	54.62	60.03	34.86	29.18	31.09	8.57	11.08	18.65	12.41	9.07
N	10	10	10	10	10	10	10	10	10	10	10	10

Females	Neurobehavioral Positive Control Data: Motor Activity Mean Motor Activity Values Postnatal Day 62	Appendix KK

	Interval											
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
Group I – Control												
Mean	171.10	153.40	143.90	124.00	103.60	95.50	91.00	55.80	57.60	37.90	32.30	32.20
S.D.	24.85	23.08	37.22	35.57	29.28	37.63	28.77	30.97	42.84	39.45	42.60	30.80
N	10	10	10	10	10	10	10	10	10	10	10	10
Group II – 2.0 mg/kg Amphetamine												
Mean	150.10	144.90	133.60	132.00	137.80	150.50	120.30	130.40	124.00	134.10	143.30	105.30
S.D.	45.19	29.05	31.40	33.97	31.90	46.83	39.06	43.90	39.58	35.23	31.92	40.12
N	10	10	10	10	10	10	10	10	10	10	10	10
Group III – 10.0 mg/kg Chlorpromazine												
Mean	33.30	18.20	12.40	10.20	8.70	0.90	4.10	2.30	6.90	5.50	2.50	0.00
S.D.	43.27	30.08	33.27	13.49	23.79	2.51	8.57	2.63	9.69	8.45	5.04	0.00
N	10	10	10	10	10	10	10	10	10	10	10	10

	2-Week Range-Finding Study Report	Appendix LL

STUDY NO. 03-6146

PROPANE: A 2-WEEK RANGE-FINDING INHALATION TOXICITY STUDY IN THE RAT VIA WHOLE-BODY EXPOSURES

Final Report

Submitted to: American Petroleum Institute (API)
1220 L Street, Northwest
Washington, DC 20005-4070

Attn: [redacted]

Date: 23 April 2010

STATEMENT OF COMPLIANCE

This study was conducted in compliance with the United States Environmental Protection Agency's (EPA) Good Laboratory Practice Standards 40 CFR Part 792 (TSCA) and the Organization for Economic Cooperation and Development (OECD) Good Laboratory Practices as set forth in ENV/MC/CHEM/(98)17 with the exception of the following:

1. A lot number for the test substance was not available.

2. The actual location for the synthesis documentation of the test substance was not provided by the supplier.

[redacted]

23 APR 10
Date

[redacted]

3/30/10
Date

SIGNATURE PAGE

SCIENTIST

The following scientist was responsible for the overall conduct of this study. Departmental supervisory personnel are listed on the personnel page of this report (Appendix O).

[redacted]

23/APR/10
Date

SCIENTIFIC REVIEW

The following scientist has reviewed and approved this report:

[redacted]

14 APRIL 2010
Date

[1] [redacted] was the original scientific reviewer of this report and is no longer employed at the Testing Facility. [redacted] is assuming responsibility for final review of this report.

QUALITY ASSURANCE STATEMENT

Listed below are the dates that this study was inspected by the Quality Assurance Unit of Huntingdon Life Sciences, East Millstone, New Jersey, and the dates that findings were reported to the Study Director and Management.

Type of Inspection	Date(s) of Inspection	Reported to Study Director and Management
GLP Protocol Review	14 Jul 03	14 Jul 03
Exposure, Monitoring & Training Records	14 Aug 03	15 Aug 03
Physical Observations	21 Aug 03	22 Aug 03
Terminal Necropsy & Equipment Records	28 Aug 03	29 Aug 03
Purity Analysis Report & Study Data	21 Oct 03	21 Oct 03
Draft Final Report , Study Data & Protocol Amendment No. 1	17 – 19 Nov 03	19 Nov 03
Propane Pre-Study Characterization & Purity Report & Data	23 Jul 04	23 Jul 04
Final Report Review	22, 24 Nov 08	24 Nov 08

[redacted]

23 Apr 10
Date

PROPANE: A 2-WEEK RANGE-FINDING INHALATION TOXICITY STUDY IN THE RAT VIA WHOLE-BODY EXPOSURES

SUMMARY

This study was designed to provide a preliminary assessment of the toxicity of propane, an industrial gas, when administered via whole-body inhalation to rats for 2 weeks in order to determine exposure levels for a subsequent OECD 422 inhalation study.

Male and female Sprague-Dawley CD® rats (10/sex/group) were exposed for six hours per day to 0 (Air Only), 120, 1200 or 12000 ppm propane for up to 15 consecutive days. At the end of the treatment period, all animals were euthanized and necropsied. The following parameters were evaluated: viability, clinical observations, body weights, feed consumption, organ weights and macroscopic observations.

Exposure levels were determined using an infrared spectrophotometer 4 times per chamber per day. Particle size distribution measurements were also made once per chamber per day using a TSI Aerodynamic Particle Sizer.

The mean (± standard deviation) analytical exposure concentrations of propane were determined to be 122.0 ± 8.7, 1230 ± 74 and 12198 ± 289 ppm for the exposure groups, respectively. Particle sizing results indicated that the atmospheres were essentially gas only, as expected, since there was no substantial difference between the test substance chambers and the air control chamber.

All animals survived to termination. The test animals were unremarkable during the daily exposure periods and the non-exposure periods. There were no adverse differences in body weights or in feed consumption in the test substance exposed animals compared to the air control animals.

No gross abnormalities related to test substance exposure were evident at necropsy examination and there were no exposure-related differences in organ weights (absolute and relative to body weight or brain weight) in the test substance exposed animals compared to the air control animals.

In conclusion, two weeks of exposure of rats to propane gas at exposure levels of 120, 1200 and 12000 ppm resulted in no effects of exposure. Therefore, the 12000 ppm exposure level was a no observable effect level (NOEL) and was considered an acceptable high exposure level (limited by safety considerations for a flammable gas) for a subsequent OECD 422 study.

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1. INTRODUCTION

This study was designed to provide a preliminary assessment of the toxicity of propane, an industrial gas, when administered via whole-body inhalation to rats for 2 weeks in order to determine exposure levels for a subsequent OECD 422 inhalation study.

2. MATERIALS AND METHODS

2.1. STUDY MANAGEMENT

2.1.1. SPONSOR

American Petroleum Institute (API)
1220 L Street, Northwest
Washington, DC 20005-4070

2.1.2. SPONSOR REPRESENTATIVE

[redacted]

2.1.3. TESTING FACILITY

Huntingdon Life Sciences (HLS)
100 Mettlers Road
East Millstone, New Jersey 08875-2360

2.1.4. STUDY DIRECTOR

[redacted]

2.2. STUDY DATES

2.2.1. STUDY INITIATION

30 July 2003 (date study director signed the protocol)

2.2.2. DATE OF ANIMAL RECEIPT

29 July 2003 (experimental start date)

2.2.3. EXPOSURE INITIATION

14 August 2003

2.2.4. EXPOSURE TERMINATION

28 August 2003

2.2.5. TERMINAL SACRIFICES

28 and 29 August 2003

2.2.6. EXPERIMENTAL TERMINATION DATE

29 August 2003 (date of last data collection)

2.2.7. STUDY COMPLETION

23 April 2010 (Date final report is signed by the study director)

2.3. EXPERIMENTAL OUTLINE

Group	Test Substance	Exposure Level[a]	Number of Animals[b]	
		ppm	Males	Females
1	Air Control	0	10	10
2	Propane	120	10	10
3	Propane	1200	10	10
4	Propane	12000	10	10

[a]Exposures were 6 hours per day for 7 consecutive days per week for 2 weeks. Exposure levels are expressed as ppm of test substance. The exposures were conducted via whole-body exposure.

[b]Complete postmortem evaluations were performed on animals at termination of the study.

The first day of exposures was defined as day 0 of the study.

2.4. JUSTIFICATIONS

2.4.1. ROUTE, DURATION AND FREQUENCY

The inhalation route is one of the potential routes of human exposure to this test substance. The duration of the study and frequency of exposures were considered to be the minimum necessary for determining exposure levels for a subsequent OECD 422 study.

2.4.2. TEST ANIMAL SELECTION

The rat is a rodent animal model commonly utilized in toxicity testing, as recommended in OECD and EPA guidelines, and will be the species used in the subsequent OECD 422 study. In addition, a historical database is available for comparative evaluation.

2.4.3. NUMBER OF ANIMALS

The number of animals in the study was considered to have been the minimum necessary for scientific and statistical reasons in order to evaluate the data with sufficient confidence levels.

2.4.4. EXPOSURE LEVEL SELECTION

The exposure levels were selected based on prior results of minimal toxicity up to 10% (100000 ppm). Therefore, the high exposure level was established (for safety reasons) as 50% of the lower explosion limit (2.4% = 24000 ppm) for the test substance.

2.5. TEST SUBSTANCE

Propane

2.5.1. TEST SUBSTANCE CATEGORY

Industrial gas

2.5.2. CAS NUMBER

74-98-6

2.5.3. SUPPLIER

MG Industries
3 Great Valley Parkway
Malvern, Pennsylvania 19355

2.5.4. LOT NUMBER

Not available

2.5.5. PURITY

99.5% per supplier. The testing facility also determined the purity by gas chromatography (GC) before the study (see Appendix N).

2.5.6. DESCRIPTION

Colorless gas

2.5.7. DATE RECEIVED

6 May 2003

2.5.8. EXPIRATION DATE

Not available, stable per MSDS. The testing facility will determine stability by GC at the completion of the subsequent OECD 422 study (No. 03-4245).

2.5.9. ANALYSIS

Documentation of the identity, strength, composition, stability and method of synthesis, fabrication and/or derivation of the batch of the test substance and the maintenance of these records was the responsibility of the supplier. Documentation of the identity, strength, composition and stability were also confirmed by the testing facility.

Note that the actual location for the synthesis of the test substance has not been provided by the supplier.

2.5.10. STORAGE

Ambient temperature

2.5.11. ARCHIVAL SAMPLE

An archival sample from the lot of test substance was taken and stored in the archives of the sponsor (EPL Archives, Inc., 45610 Terminal Drive, Sterling, Virginia 20166). A common archival sample will be taken for this range-finding study and the subsequent OECD 422 study.

2.5.12. DISPOSITION

The unused portion of the test substance as well as any empty test substance containers will be returned to the supplier following submission of the final report of the final study with this test substance.

2.6. TEST ANIMALS

2.6.1. SPECIES

Albino Rats (Outbred) VAF/Plus®
Sprague-Dawley – Derived (CD®)
Crl:CD® (SD) IGS BR

2.6.2. SUPPLIER

Charles River Laboratories
Raleigh, North Carolina 27610

2.6.3. NUMBER OF ANIMALS

Received:
87 total (44 males, 43 females)

Placed on test:
80 total (40 males, 40 females)

Females were nulliparous and non-pregnant.

2.6.4. AGE AT RECEIPT

Approximately 6 weeks

2.6.5. AGE AT INITIATION OF EXPOSURES

Approximately 8 weeks

2.6.6. WEIGHT AT INITIATION OF EXPOSURES (GRAMS)

	Mean	Range
Male:	283	263 - 316
Female:	194	175 - 221

Individual weights of animals placed on test were within ±20% of the mean weight for each sex.

2.6.7. ACCLIMATION PERIOD

Animals were acclimated for approximately 2 weeks. All animals were checked for viability twice daily. Prior to assignment to study, all animals were examined to ascertain suitability for study.

2.7. ANIMAL ASSIGNMENT

More animals than required for the study were purchased and acclimated. Animals considered unsuitable for the study on the basis of pretest physical examinations and body weight data were eliminated prior to random selection for group assignment. Animals considered suitable for study were distributed into 4 groups of 10 animals per sex by a computerized random sort program so that body weight means for each group were comparable. Disposition of all animals not utilized in the study is maintained in the study file.

2.8. ANIMAL IDENTIFICATION

Each animal was assigned a temporary identification number upon receipt. After selection for study, each animal was ear-tagged with a number assigned by the testing facility. The assigned animal number plus the study number comprised the unique animal number for each animal. If the tag was lost, it was replaced. In addition, each cage was provided with a cage card, which was color-coded for exposure level identification and contained study number and animal number information.

2.9. VETERINARY CARE

Animals were monitored by the technical staff for any conditions requiring possible veterinary care, and treated as necessary.

2.10. HUSBANDRY DURING NON-EXPOSURE PERIODS

2.10.1. FACILITIES MANAGEMENT/ANIMAL HUSBANDRY

Currently acceptable practices of good animal husbandry were followed, e.g., *Guide for the Care and Use of Laboratory Animals*; National Academy Press, 1996. Huntingdon Life Sciences, East Millstone, New Jersey is fully accredited by the Association for Assessment and Accreditation of Laboratory Animal Care International (AAALAC).

2.10.2. HOUSING

Animals were individually housed in suspended, stainless steel wire mesh cages during the study.

2.10.3. FEED

Certified Rodent Diet, No. 5002; (Meal) (PMI Nutrition International, St. Louis, Missouri) was available without restriction except when animals were fasted for terminal sacrifice. Fresh feed was presented weekly.

2.10.4. FEED ANALYSIS

Analysis of the feed lot used during this study was performed by the manufacturer. Results are maintained on file at the testing facility. There were no known contaminants in the feed that were expected to interfere with the objectives of this study.

2.10.5. WATER

Water (Elizabethtown Water Company, Westfield, New Jersey) was available without restriction via an automated watering system.

2.10.6. WATER ANALYSIS

Water analyses are conducted by Elizabethtown Water Company, Westfield, New Jersey (Raritan - Millstone Plant) to ensure that water meets standards specified under the EPA Federal Safe Drinking Water Act Regulations (40 CFR Part 141). In addition, water samples are collected biannually from representative rooms in the testing facility; chemical and microbiological water analyses are conducted on these samples by a subcontract laboratory. Results of all water analyses are maintained on file at the testing facility. There were no known contaminants in the water that were expected to interfere with the results of this study.

2.10.7. ENVIRONMENTAL CONDITIONS

Light/Dark Cycle

A twelve-hour light/dark cycle, controlled via an automatic timer, was provided.

Temperature

Temperature was monitored in accordance with the testing facility SOPs and maintained within the specified range to the maximum extent possible.

Desired Range:	18 to 26°C
Actual Range:	20.3 to 23.1°C
Daily Average Range:	20.8 to 22.0°C

Relative Humidity

Relative humidity was monitored in accordance with the testing facility SOPs and maintained within the specified range to the maximum extent possible. Excursions outside the specified range were not considered to have affected the integrity of the study.

Desired Range:	30 to 70%
Actual Range:	44.02 to 70.50%
Daily Average Range:	49.03 to 53.99%

2.11. HUSBANDRY DURING EXPOSURE PERIODS

2.11.1. HOUSING

Animals were individually housed in stainless steel, wire mesh cages within 1000 liter stainless steel and glass whole-body exposure chambers. The placement of each animal in the chamber was rotated at each exposure to ensure uniform exposure of the animals. A description of the animal rotation is included in the raw data.

2.11.2. FEED

None was provided during exposure.

2.11.3. WATER

None was provided during exposure.

2.11.4. ENVIRONMENTAL CONDITIONS

Chamber temperature and relative humidity were recorded at the initiation of exposures and every half-hour during exposure, and maintained to the maximum extent possible, within the ranges presented below. Excursions outside the specified ranges were not considered to have affected the integrity of the study.

Temperature

Desired Range:	20 to 24°C
Actual Range:	21 to 24°C

Relative Humidity

Desired Range:	40 to 60%
Actual Range:	54 to 63%

2.12. TEST SUBSTANCE ADMINISTRATION AND CHAMBER OPERATION

2.12.1. ROUTE OF ADMINISTRATION

Inhalation, as a gas, via whole-body exposure.

2.12.2. FREQUENCY AND DURATION OF ADMINISTRATION

The test substance was administered for 6 hours per day for 7 consecutive days per week for 14 or 15 days. Test substance administration continued through the day prior to necropsy.

2.12.3. PRE-STUDY TRIALS

Trials were performed (at least two 6-hour periods) to evaluate the optimal set of conditions and equipment to generate a stable and uniform atmosphere at the targeted exposure levels. During this time, samples were taken to determine the distribution of the test substance in the exposure chamber.

2.12.4. CHAMBER OPERATION

The whole-body exposure chambers each had a volume of 1000 liters. Each chamber was operated dynamically under slight negative pressure at a minimum calibrated flow rate of 200 liters per minute. The final airflow was set to provide at least one air change (calculated by dividing the chamber volume by the airflow rate) in 5.0 minutes (12 air changes/hour) and a T_{99} equilibrium time (calculated by multiplying the air change by the exponential factor 4.6) of at most 23 minutes. The chamber airflow rate, total flow rate, time for air change and 99% equilibrium time (T_{99}) for each group are summarized below.

Group	Airflow Rate (Lpm)	Air Change (min)	T_{99} (min)
1	212	4.7	21.6
2	218	4.6	21.2
3	212	4.7	21.6
4	210	4.8	22.1

This chamber size and airflow rates were considered adequate to maintain the animal loading factor below 5% and the oxygen level at 19% or higher. At the end of the exposure, all animals remained in chamber for a minimum of 30 minutes. During this time, the chamber was operated at the same flow rate as used during the exposure using clean air only. Recordings of airflow rate and static

pressure were made at the initiation of the exposures and every half-hour during the exposures.

The chamber atmospheres were exhausted through the in-house filtering system, which consisted of a coarse filter, a HEPA filter, and an activated charcoal bed.

Refer to Figures 1 and 2, and Appendix I for equipment details.

2.12.5. EXPOSURE PROCEDURE

Group 1

Animals were exposed to room air only.

Groups 2, 3 and 4

The test substance was delivered from a single cylinder, through a regulator and two backpressure gauges, and branched, via ¼" tubing, to the three exposure chambers. For each chamber, ¼" tubing directed the test substance to a flowmeter, regulated by a metering valve, and into the inlet of a 1000 liter stainless steel and glass whole-body exposure chamber.

Refer to Figures 1 and 2, and Appendix I for equipment details.

2.13. EXPOSURE CHAMBER SAMPLING

2.13.1. CHAMBER SAMPLING

Determination of the exposure levels were made using a MIRAN® Ambient Air analyzer equipped with a strip chart recorder. The test atmosphere was drawn from the normal sampling portal through the MIRAN® and measurements were recorded at least 4 times during each exposure. The exposure levels were determined by comparison of the measured absorbance to a calibrated response curve constructed using the same instrument settings.

Refer to Appendix I for equipment details and Appendix J for MIRAN calibration.

2.13.2. PARTICLE SIZE DISTRIBUTION ANALYSIS

Particle size samples were drawn once during each exposure for the chambers and room air using a TSI Aerodynamic Particle Sizer. The samples were drawn for 20 seconds at a rate of 5.0 Lpm. The mass median aerodynamic diameter, geometric standard deviation and total mass concentration were calculated. A computer was used to program the system to the appropriate settings prior to sampling. The particle size distributions were calculated by the computer and printed out.

Refer to Appendix I for equipment details.

2.13.3. NOMINAL CONCENTRATION

The nominal exposure concentration (ppm) was calculated by dividing the average test substance flow (ccm) during the exposure by the average chamber airflow (Lpm).

$$\text{Nominal (ppm)} = \frac{\text{Test Substance Flow (ccm)} \times 1000\ \mu\text{L/cc}}{\text{Total Chamber Airflow (Lpm)}}$$

2.13.4. CHAMBER AND EXPOSURE ROOM ENVIRONMENT

Chamber oxygen levels (maintained at least 19%) were measured pretest and at the beginning, middle and end of the study. Air samples were taken in the vapor generation area pretest and at the beginning, middle and end of the study. Light (maintained approximately 30 – 40 foot-candles at 1.0 meter above the floor) and noise levels (maintained below 85 decibels) in the exposure room were measured pretest and at the beginning, middle and end of the study.

Refer to Appendix I for equipment details.

2.14. EXPERIMENTAL EVALUATIONS

2.14.1. VIABILITY CHECKS (CAGE-SIDE)

Animals were observed in their cages for mortality and general condition twice daily (once in the morning and once in the afternoon).

2.14.2. PHYSICAL EXAMINATIONS

In-Chamber: All animals were observed as a group at least once during each exposure.

Out-of-Chamber: Each animal was removed from its cage and examined twice pretest (including on the first day of exposure) and once per week during the study period. Examinations included general condition, skin and fur, eyes, nose, oral cavity, abdomen and external genitalia, occurrence of secretions and excretions, and autonomic activity (e.g., lacrimation, piloerection, pupil size, unusual respiratory pattern). Changes in gait, posture and response to handling, as well as the presence of clonic or tonic movements, stereotypy (e.g., excessive grooming, repetitive circling) or bizarre behavior (e.g., self-mutilation, walking backward) were recorded.

2.14.3. BODY WEIGHT

Animals were removed from their cages and weighed twice pretest (including on the first day of exposure) and weekly during treatment. Terminal, fasted body weights were obtained just prior to necropsy.

2.14.4. FEED CONSUMPTION

Feed consumption was measured during the week prior to treatment initiation and weekly during the study. Feed was available without restriction 7 days/week, except during exposures and terminal fasting. Animals were presented with full feeders of known weight. After 6 or 7 days, the feeders were reweighed and the resulting weight subtracted from the initial feeder weight to obtain the grams of feed consumed per animal over the 6 or 7-day period.

Calculation

$$\text{Feed Consumption (g/kg/day)} = \frac{\text{grams of feed consumed}}{\text{body weight (kg)}^{a}} \div \text{6 or 7 days}$$

[a]The average of the current and previous weight was used.

2.15. POSTMORTEM

2.15.1. NECROPSY INFORMATION

Necropsy was performed on all surviving animals, after animals were treated for 14 or 15 days. Animals were fasted overnight prior to necropsy. A necropsy schedule was established in order to assure that approximately equal numbers of males and females were examined on each day of necropsy and that examination of animals of both sexes were performed at similar times of the day throughout the necropsy period.

Method of Euthanasia

Exsanguination following carbon dioxide inhalation.

2.15.2. MACROSCOPIC EXAMINATIONS

Complete macroscopic postmortem examinations were performed on all animals. The macroscopic examination included examination of the external surface of the body, all orifices and the cranial, thoracic, abdominal cavities and their content. Special attention was paid to the organs of the reproductive system.

2.15.3. ORGAN WEIGHTS

Organs indicated in Table I (page 23) were weighed for all animals at the scheduled necropsies. Prior to weighing, the organs were carefully dissected and properly trimmed to remove adipose and other contiguous tissues in a uniform manner. Organs were weighed as soon as possible after dissection in order to avoid drying. Paired organs were weighed together.

2.15.4. TISSUES PRESERVED

The tissues listed in Table I (page 23) were obtained at the scheduled sacrifice interval and preserved for all animals. No microscopic examination was performed.

TABLE I

ORGAN NAME	WEIGHED	PRESERVED
adrenal glands	X	X
aorta (thoracic)		X
bone (sternum, femur)		X
bone marrow (rib)		X
brain (medulla, pons, cerebrum and cerebellum)	X	X
epididymides	X	X
esophagus		X
eyes with optic nerve		X
heart	X	X
kidneys	X	X
lacrimal glands		X
large intestine (cecum, colon, rectum)		X
larynx		X
liver	X	X
lungs (with mainstem bronchi)	X	X
lymph nodes (mesenteric, mediastinal)		X
mammary gland		X
muscle (*biceps femoris*)		X
nasopharyngeal tissue		X
nerve (sciatic)		X
ovaries	X	X
pancreas		X
pituitary gland	X	X
prostate gland		X
salivary glands with submandibular lymph node		X
seminal vesicles	X	X
skin		X
small intestine (duodenum, ileum, jejunum)		X
spinal cord (cervical, thoracic, lumbar)		X
spleen	X	X
stomach		X
testes	X	X
thymus	X	X
thyroid/parathyroid glands		X
trachea		X
urinary bladder		X
uterus (body/horns with cervix)	X	X
zymbal's gland		X
tissues with macroscopic findings		X

Preservatives

All tissues - 10% neutral buffered formalin.
Eyes were placed in glutaraldehyde/paraformaldehyde initially and then retained in 10% formalin. Testes and epididymides were placed in Modified Davidson's solution initially and then retained in 10% formalin. Lungs and urinary bladder were infused with formalin prior to their immersion into a larger volume of the same fixative.

Smear preparations of the marrow from the rib were air dried and fixed in absolute methanol.

2.16. STATISTICAL ANALYSIS

The following parameters were analyzed statistically:

mean body weight values
mean feed consumption values
mean organ weights, organ/body and organ/brain weight ratios

2.16.1. METHOD OF ANALYSIS

Mean values of all exposure groups were compared to the mean value for the control group at each time interval.

Evaluation of equality of group means was made by the appropriate statistical method, followed by a multiple comparison test if needed. Bartlett's test (Sokal and Rohlf, 1995) was performed to determine if groups had equal variances. For all parameters except organ weights, if the variances were equal, parametric procedures were used; if not, nonparametric procedures were used. Organ weight data was analyzed only by parametric methods. The parametric method was the standard one-way analysis of variance (ANOVA) using the F ratio to assess significance (Dunlap and Duffy, 1975). If significant differences among the means were indicated, additional tests were used to determine which means were significantly different from the control: Dunnett's (Dunlap et al., 1981; Dunnett, 1955, 1964), or Cochran and Cox's modified t-test (Cochran and Cox, 1959). The nonparametric method was the Kruskal-Wallis test (Kruskal and Wallis, 1952, 1953) and if differences were indicated, Pairwise Comparison with Bonferroni

Correction (Games and Howell, 1976) was used to determine which means differed from control. Bartlett's test for equality of variance was conducted at the 1% significance level; all other statistical tests were conducted at the 5% and 1% significance levels.

2.17. DATA STORAGE

All raw data, and preserved specimens, as well as the original study protocol and the original final report, are to be maintained in the Archives of the testing facility upon completion of the study. The sponsor will determine the final disposition of these materials.

2.18. REGULATORY REFERENCES

2.18.1. TEST GUIDELINES

This study was not designed to meet regulatory requirements. It was designed to provide preliminary toxicity data for the test substance in order to determine appropriate exposure levels for a subsequent OECD 422 inhalation study.

2.18.2. GOOD LABORATORY PRACTICES

This study was conducted in compliance with EPA Good Laboratory Practices as set forth in 40 CFR Part 792 (TSCA) and Organization for Economic Cooperation and Development (OECD) Good Laboratory Practices as set forth in ENV/MC/CHEM(98)17.

2.18.3. ANIMAL WELFARE ACT COMPLIANCE

This study complied with all appropriate parts of the Animal Welfare Act regulations: 9 CFR Parts 1 and 2 Final Rules, Federal Register, Volume 54, No. 168, August 31, 1989, pp. 36112-36163, effective October 30, 1989 and 9 CFR Part 3 Animal Welfare Standards; Final Rule, Federal Register, Volume 56, No. 32, February 15, 1991, pp. 6426-6505, effective March 18, 1991.

2.19. PROTOCOL DEVIATIONS

No protocol deviations occurred during this study.

3. RESULTS AND DISCUSSION

3.1. TEST SUBSTANCE ANALYSIS

(Appendix N)

Prestudy GC analysis of the test substance showed a purity of 99.91% for propane. This value compared closely to the purity of 99.84% for the analytical standard of propane and the 99.5% purity as guaranteed by the supplier of the test substance.

3.2. CHAMBER MONITORING

(Appendices A, K and L)

Chamber distribution analyses (see Appendix K) showed that the test substance was evenly distributed within each chamber. Chamber monitoring (see Appendix L) showed that the chamber oxygen levels were 21%. Chamber room monitoring (see Appendix L) showed that no test substance was present in the room and that the sound and light levels were acceptable.

The target and mean (± standard deviation) analytical (IR) and nominal concentrations (see Appendix A) are summarized as follows:

Group	Test Substance	Target Concentration (ppm)	Analytical Concentration (ppm)	Nominal Concentration (ppm)
1	Air Control	0	0.00 ± 0.00	0 ± 0
2	Propane	120	122.0 ± 8.7	123 ± 2
3	Propane	1200	1230 ± 74	1090 ± 40
4	Propane	12000	12198 ± 289	11300 ± 0

The analytically measured (IR) exposure levels of the airborne test substance were reasonably close, in the opinion of the study director, to the targeted exposure levels. The differences between measured and nominal concentrations varied somewhat from the expected 1:1 ratio for this type of gas exposure. The exact cause of the differences was not determined but was probably a result of a combination of slight variances in the

calibration of the chamber airflows and the calibration of the IR monitor. Chamber environmental conditions averaged 23°C temperature and 57% relative humidity.

Mean particle size distribution measurements for the exposures (see Appendix A) are summarized as follows:

Group	Test Substance	Mass Median Aerodynamic Diameter (µm)	Geometric Standard Deviation	Total Mass Concentration (mg/m^3)
1	Air Control	1.463	2.087	5.54E-03
2	Propane	1.397	2.097	5.57E-03
3	Propane	1.281	2.148	5.92E-03
4	Propane	1.142	1.853	5.12E-03

These results indicated that the atmospheres were essentially gas only, as expected, since there was no substantial difference between the test substance chambers and the air control chamber.

3.3. MORTALITY

(Appendix B)

All animals survived to termination.

3.4. CLINICAL OBSERVATIONS

3.4.1. EXPOSURE PERIODS

(Table 1)

The test animals were unremarkable during the exposure periods.

3.4.2. NON-EXPOSURE PERIODS

(Table 2 & Appendix C)

The test animals were generally unremarkable during the non-exposure periods. Scattered observations such as red nasal discharge were noted but were not attributed to treatment.

3.5. BODY WEIGHTS

(Figures 3 and 4, Tables 3 and 4 & Appendices D and E)

There were no adverse differences in absolute body weights or in body weight changes in the test substance exposed animals compared to the air control animals. There were test substance-related and statistically significant differences in absolute body weights and in body weight changes in the test substance exposed male animals compared to the air control animals. However, the differences were not in an exposure level-related pattern (the largest differences were in the 120 ppm exposed animals). Also, there were no statistically significant differences in absolute body weights or in body weight changes in the test substance exposed female animals compared to the air control animals.

3.6. FEED CONSUMPTION

(Figures 5 and 6, Table 5 & Appendix F)

There were no statistically significant or exposure-related differences in feed consumption in the test substance exposed animals compared to the air control animals.

3.7. ORGAN WEIGHTS

(Table 6 & Appendix G)

There were no exposure-related differences in organ weights (absolute and relative to body weight or brain weight) in the test substance exposed animals compared to the air control animals. A number of statistically significant differences were noted in thymus, kidney, brain, heart and pituitary weights (absolute and/or relative to body weight or brain weight) for the 120 and 12000 ppm exposed male animals. However, in the absence of an exposure level related pattern (the largest differences were

in the 120 ppm exposed animals) and any corresponding macroscopic postmortem findings, these differences were considered incidental.

3.8. MACROSCOPIC PATHOLOGY

(Table 7 & Appendix H)

No gross abnormalities related to test substance exposure were evident at necropsy examination. The macroscopic lesions noted were similar to those routinely encountered in animals of this age and species or were represented by individual animals and considered incidental findings.

4. CONCLUSION

Two weeks of exposure of rats to propane gas at exposure levels of 120, 1200 and 12000 ppm resulted in no effects of exposure. Therefore, the 12000 ppm exposure level was a no observable effect level (NOEL) and was considered an acceptable high exposure level (limited by safety considerations for a flammable gas) for a subsequent OECD 422 study.

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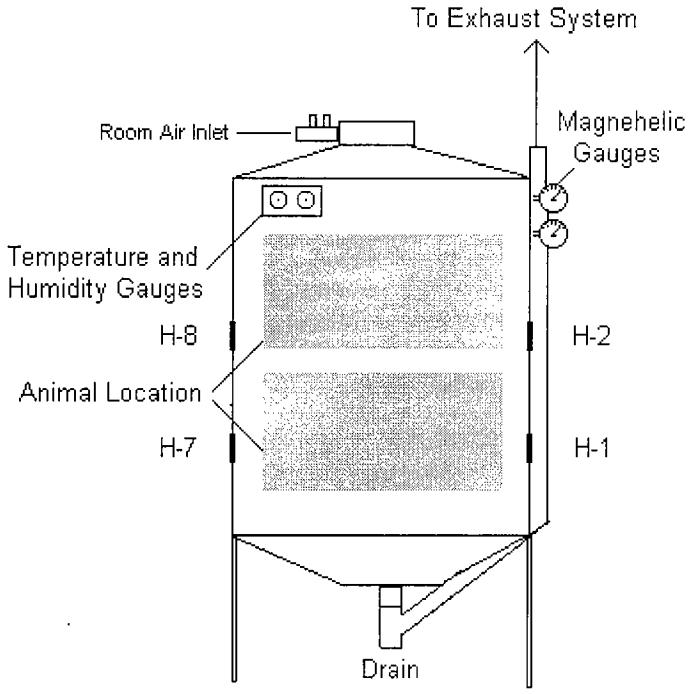
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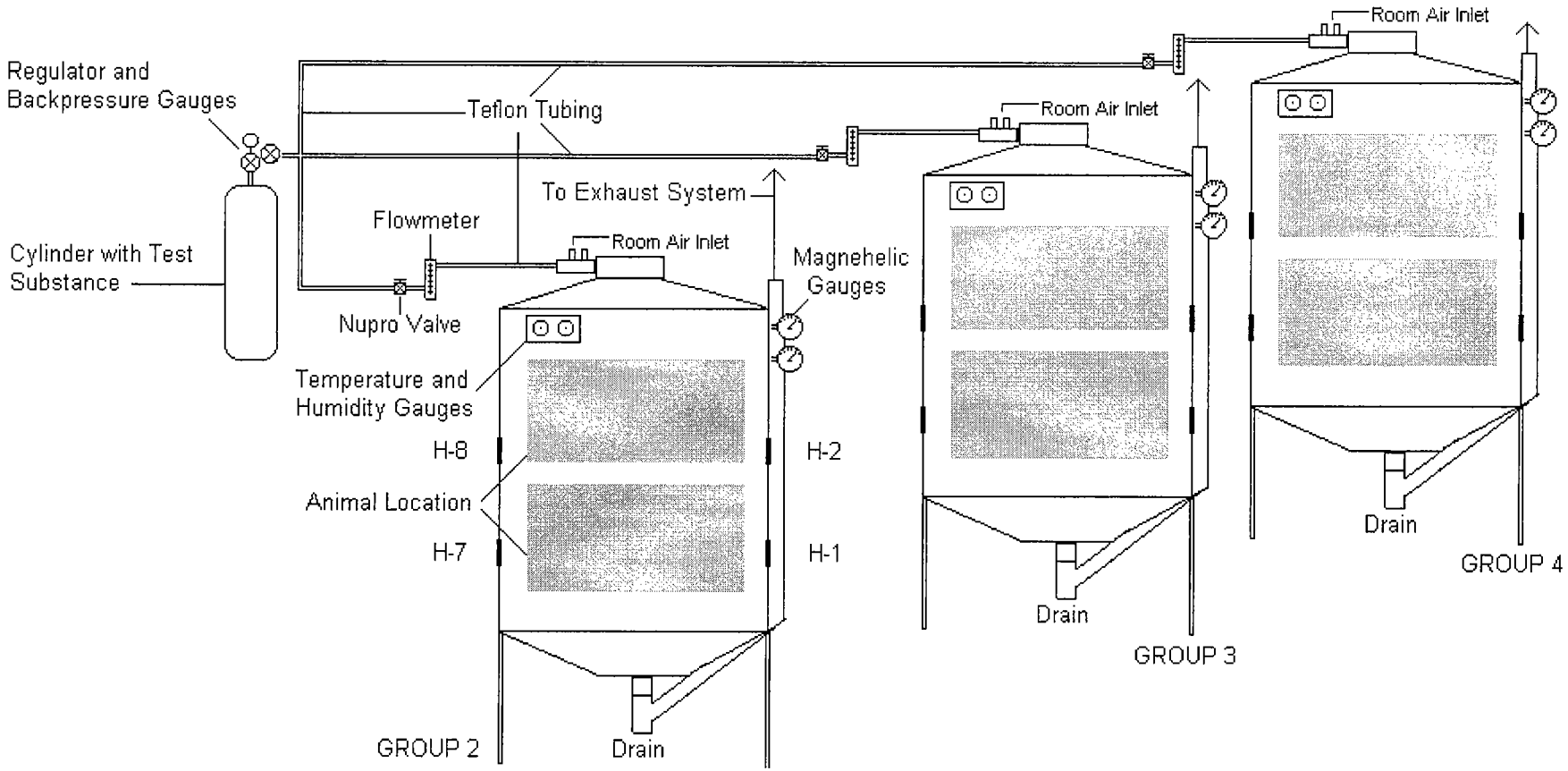
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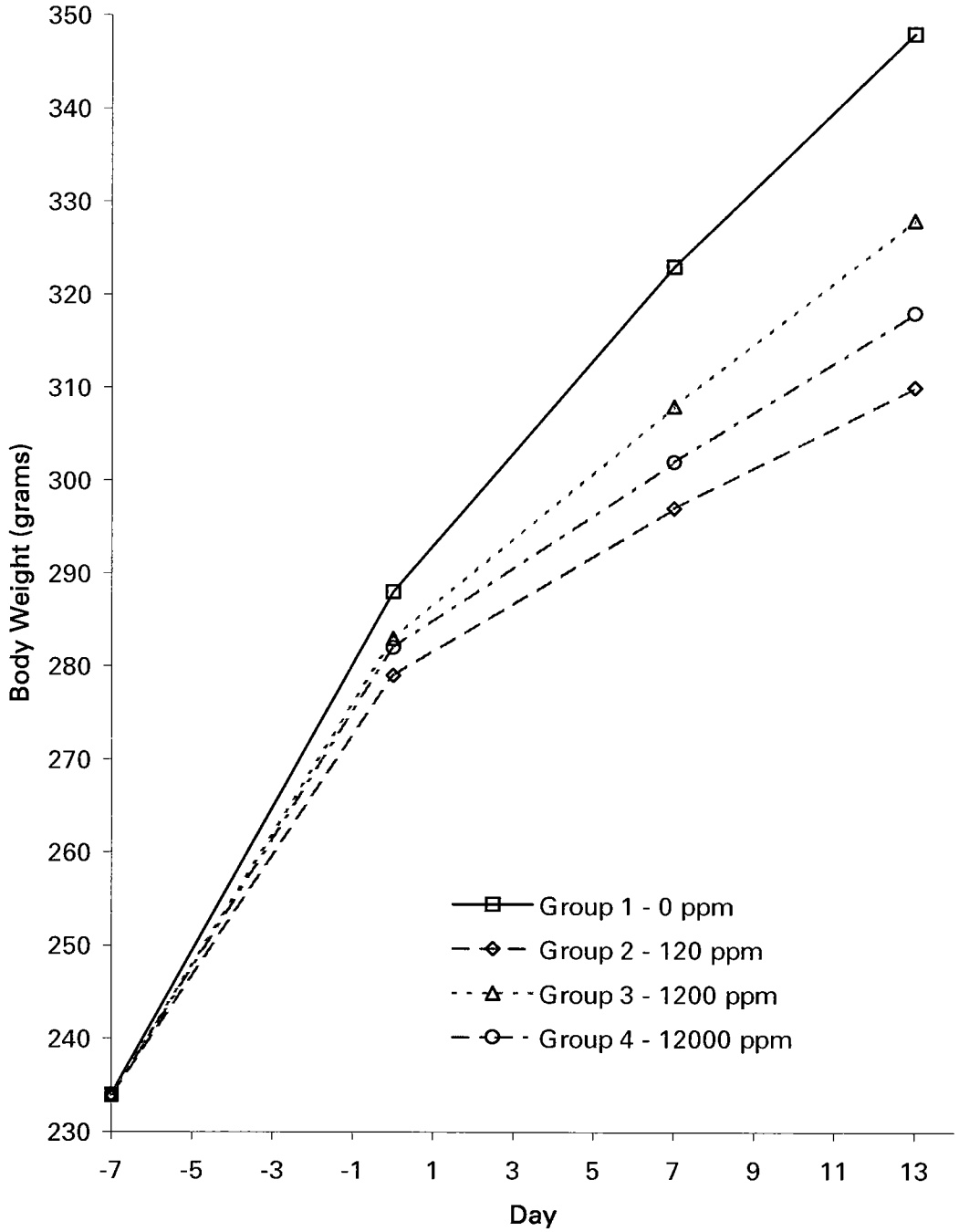
Group 1	Diagram of 1000-Liter Whole-Body Exposure Chamber and Generation System	Figure 1



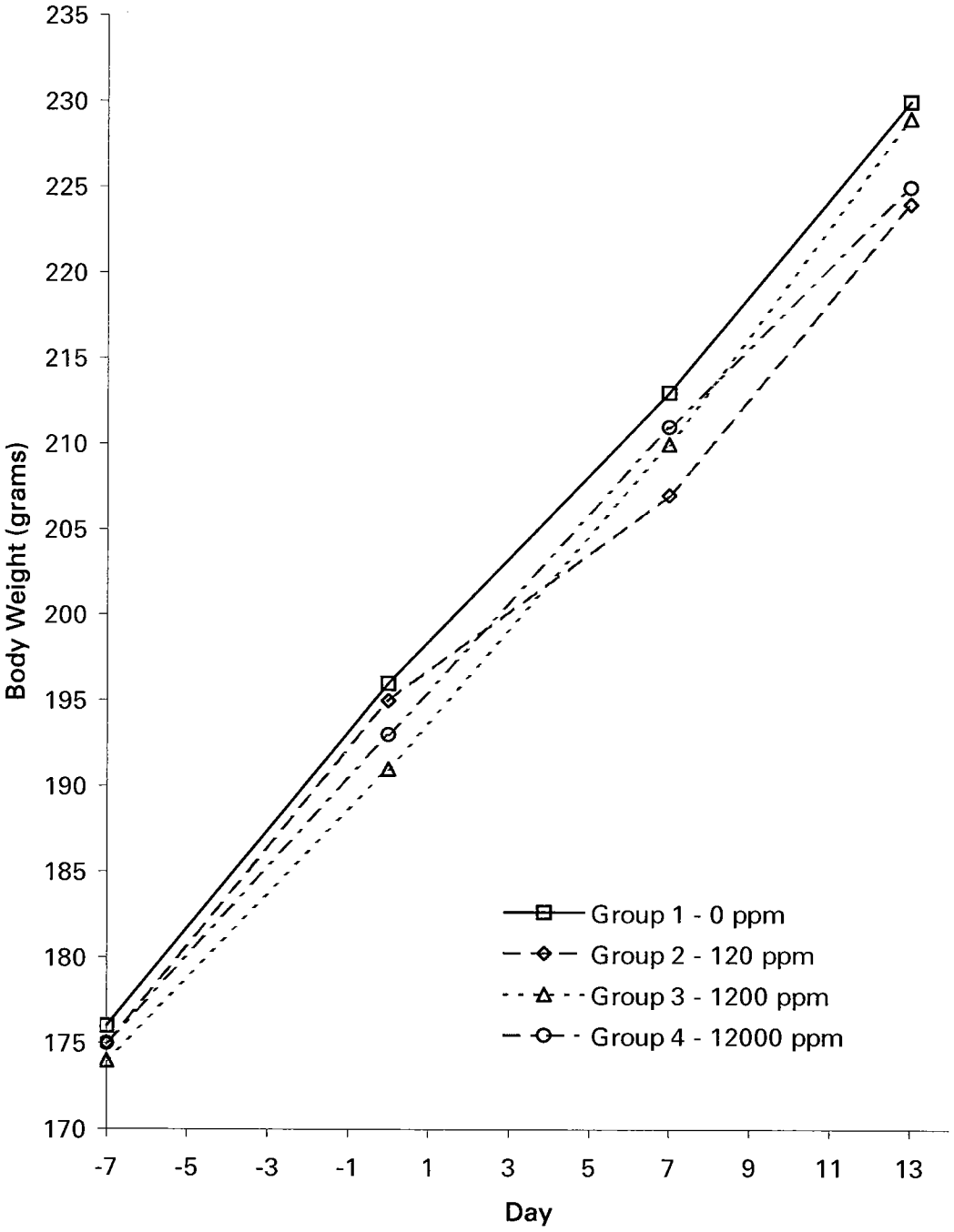
Groups 2, 3 & 4	Diagram of 1000-Liter Whole-Body Exposure Chamber and Generation System	Figure 2



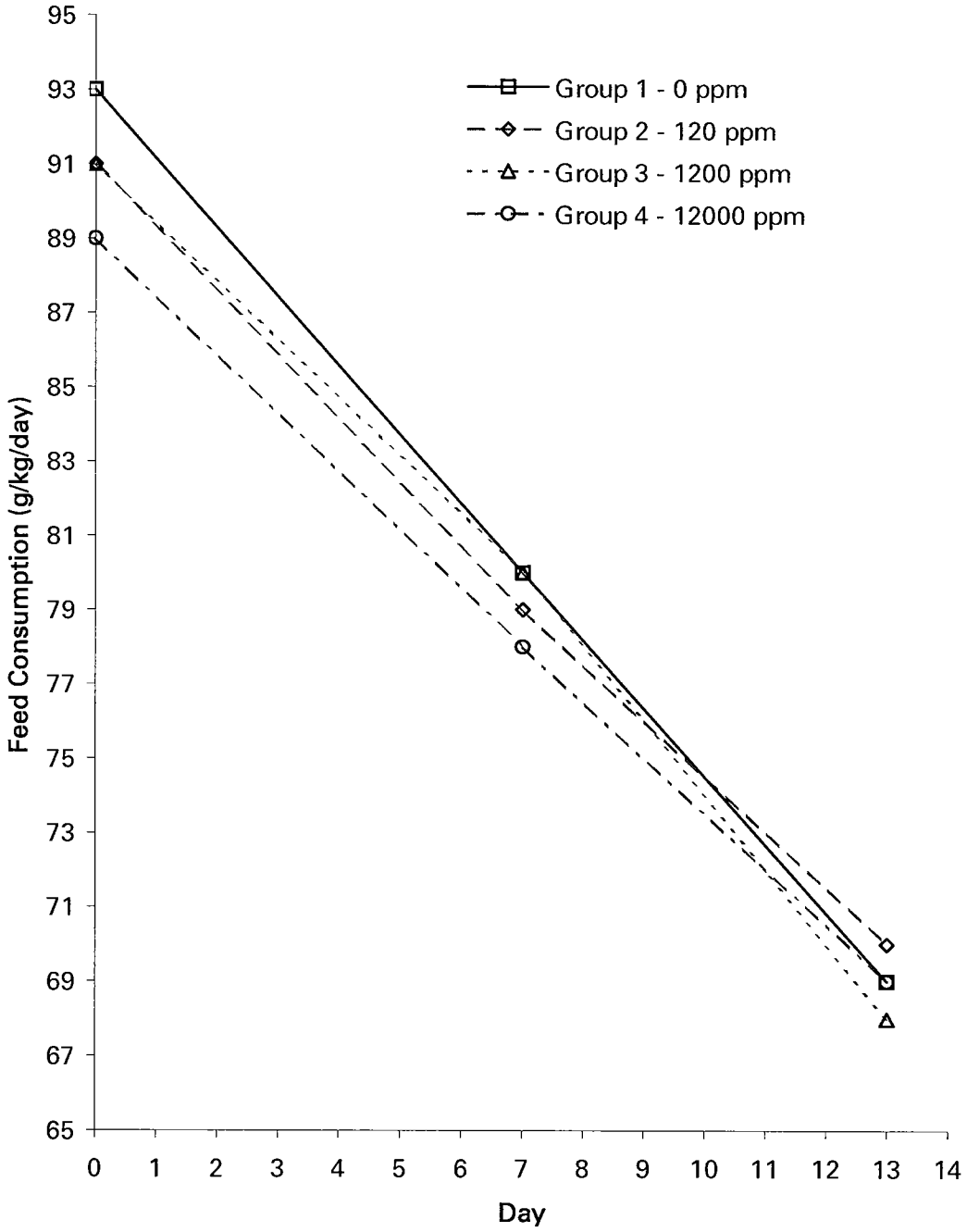
Males	Mean Body Weights	Figure 3



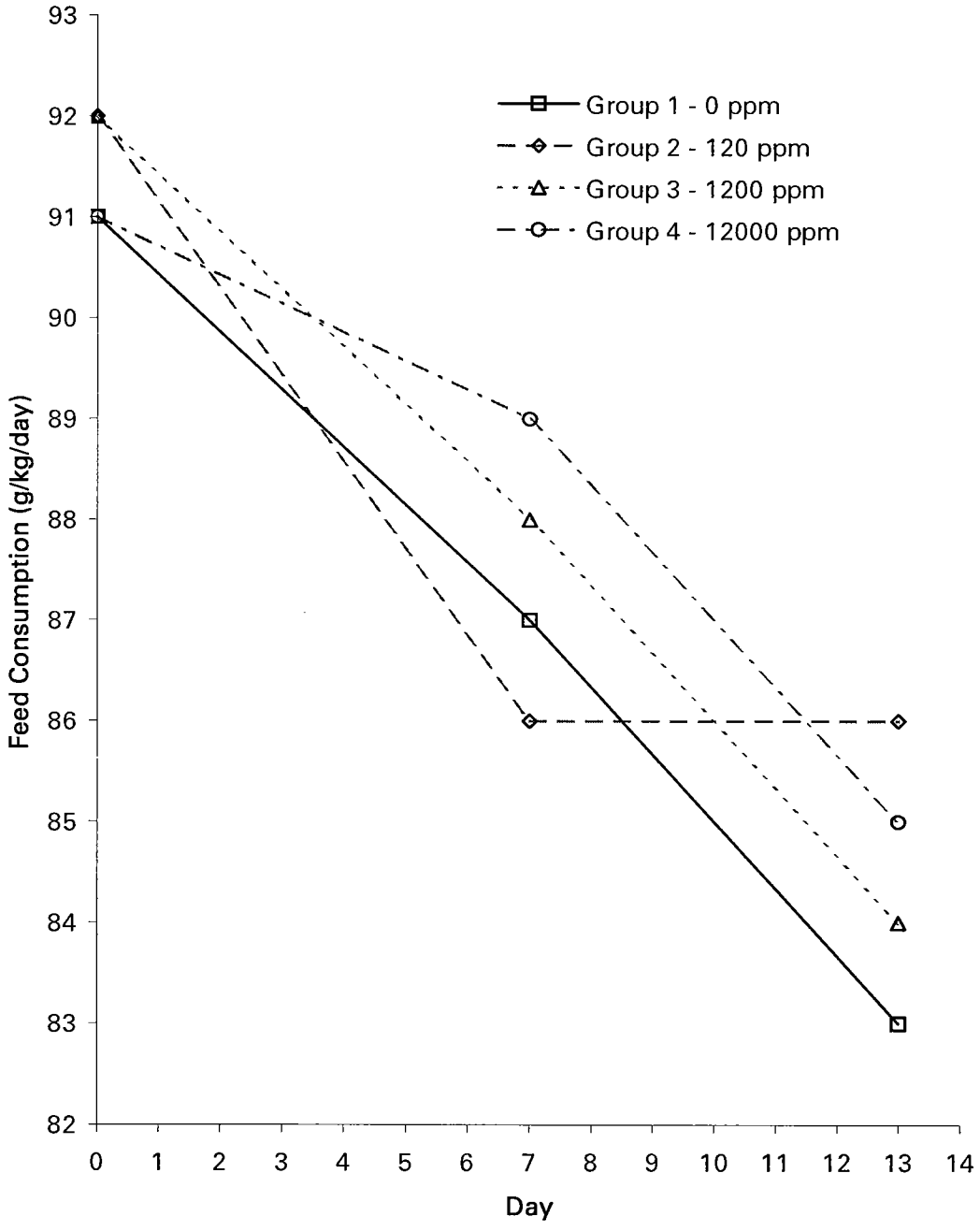
Females	Mean Body Weights	Figure 4



Males	Mean Feed Consumption	Figure 5



Females	Mean Feed Consumption	Figure 6



	General Preface	

General Notes

Individual animal data values presented in this report may be rounded. Unrounded individual animal data values are used to calculate the reported mean and standard deviation values. Therefore, use of the reported individual values to reproduce means, standard deviations and/or to perform any subsequent calculations may produce minor discrepancies between the calculated values and those presented in this report.

	Summary of In-Chamber Observations										Table 1				
Exposure Day	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**
Group 1 – 0 ppm															
Within Normal Limits	All	All	All	All	All	All	All	All	All	All	All	All	All	All	All
Group 2 – 120 ppm															
Within Normal Limits	All	All	All	All	All	All	All	All	All	All	All	All	All	All	All
Group 3 – 1200 ppm															
Within Normal Limits	All	All	All	All	All	All	All	All	All	All	All	All	All	All	All
Group 4 – 12000 ppm															
Within Normal Limits	All	All	All	All	All	All	All	All	All	All	All	All	All	All	All

All = 100% of the animals exhibiting a given observation.
Note: In-chamber observations are based on all animals present in the exposure chamber at the time.

	Summary of Clinical Observations Preface	Table 2

Number of animals examined represents the total number of animals observed.

For summarization purposes, descriptive comments [i.e., location of scab(s) and/or sore(s), etc.] are not presented in this table. These data are contained in the study raw data if needed.

Total represents a cumulative total of all animals with the indicated observation one or more times during the study.

Corresponding exposure levels for each group were as follows:

Group 1 - 0 ppm
Group 2 - 120 ppm
Group 3 - 1200 ppm
Group 4 - 12000 ppm

TABLE 2

PROPANE: A 2-WEEK RANGE-FINDING INHALATION TOXICITY
STUDY IN THE RAT VIA WHOLE-BODY EXPOSURES

MALES — SUMMARY OF CLINICAL OBSERVATIONS

		DAY OF STUDY						
	GROUP#	-7	0	7	13	14	15	TOTAL
# OF ANIMALS EXAMINED	1	10	10	10	10	8	2	
	2	10	10	10	10	8	2	
	3	10	10	10	10	8	2	
	4	10	10	10	10	8	2	
NORMAL								
WITHIN NORMAL LIMITS	1	10	10	10	10	0	0	10
	2	10	10	7	7	0	0	10
	3	10	10	10	10	0	0	10
	4	10	10	6	4	0	0	10
DEAD								
Terminal Sacrifice	1	0	0	0	0	8	2	10
	2	0	0	0	0	8	2	10
	3	0	0	0	0	8	2	10
	4	0	0	0	0	8	2	10
DERMAL GENERAL								
Scab(s)	1	0	0	0	0	0	0	0
	2	0	0	1	1	0	0	1
	3	0	0	0	0	0	0	0
	4	0	0	1	0	0	0	1
Alopecia -	1	0	0	0	0	0	0	0
Extremities/Snout	2	0	0	2	2	0	0	2
	3	0	0	0	0	0	0	0
	4	0	0	1	1	0	0	1
Red/Brown	1	0	0	0	0	0	0	0
Stains-Extremities/Snout	2	0	0	0	0	0	0	0
	3	0	0	0	0	0	0	0
	4	0	0	2	2	0	0	2

TABLE 2

PROPANE: A 2-WEEK RANGE-FINDING INHALATION TOXICITY
STUDY IN THE RAT VIA WHOLE-BODY EXPOSURES

MALES — SUMMARY OF CLINICAL OBSERVATIONS

		DAY OF STUDY						
	GROUP#	-7	0	7	13	14	15	TOTAL
# OF ANIMALS EXAMINED	1	10	10	10	10	8	2	
	2	10	10	10	10	8	2	
	3	10	10	10	10	8	2	
	4	10	10	10	10	8	2	
OCULAR								
Chromodacryorrhea - Unilateral	1	0	0	0	0	0	0	0
	2	0	0	0	0	0	0	0
	3	0	0	0	0	0	0	0
	4	0	0	1	0	0	0	1
Lacrimation - Unilateral	1	0	0	0	0	0	0	0
	2	0	0	0	0	0	0	0
	3	0	0	0	0	0	0	0
	4	0	0	1	0	0	0	1
ORAL/BUCCAL								
Incisors Maloccluded	1	0	0	0	0	0	0	0
	2	0	0	0	0	0	0	0
	3	0	0	0	0	0	0	0
	4	0	0	1	1	0	0	1
Nasal Discharge - Red	1	0	0	0	0	0	0	0
	2	0	0	0	0	0	0	0
	3	0	0	0	0	0	0	0
	4	0	0	0	2	0	0	2

TABLE 2

PROPANE: A 2-WEEK RANGE-FINDING INHALATION TOXICITY
STUDY IN THE RAT VIA WHOLE-BODY EXPOSURES

FEMALES — SUMMARY OF CLINICAL OBSERVATIONS

		DAY OF STUDY						
	GROUP#	-7	0	7	13	14	15	TOTAL
# OF ANIMALS EXAMINED	1	10	10	10	10	7	3	
	2	10	10	10	10	7	3	
	3	10	10	10	10	7	3	
	4	10	10	10	10	7	3	
NORMAL								
WITHIN NORMAL LIMITS	1	10	10	10	10	0	0	10
	2	10	10	7	8	0	0	10
	3	10	10	9	9	0	0	10
	4	10	9	8	8	0	0	10
DEAD								
Terminal Sacrifice	1	0	0	0	0	7	3	10
	2	0	0	0	0	7	3	10
	3	0	0	0	0	7	3	10
	4	0	0	0	0	7	3	10
DERMAL GENERAL								
Scab(s)	1	0	0	0	0	0	0	0
	2	0	0	1	1	0	0	1
	3	0	0	0	0	0	0	0
	4	0	1	1	1	0	0	1
Alopecia -	1	0	0	0	0	0	0	0
Extremities/Snout	2	0	0	0	0	0	0	0
	3	0	0	1	1	0	0	1
	4	0	0	0	0	0	0	0
Red Stains on Head	1	0	0	0	0	0	0	0
	2	0	0	2	1	0	0	2
	3	0	0	0	0	0	0	0
	4	0	0	0	0	0	0	0

TABLE 2

PROPANE: A 2-WEEK RANGE-FINDING INHALATION TOXICITY
STUDY IN THE RAT VIA WHOLE-BODY EXPOSURES

FEMALES — SUMMARY OF CLINICAL OBSERVATIONS

		DAY OF STUDY						
	GROUP#	-7	0	7	13	14	15	TOTAL
# OF ANIMALS EXAMINED	1	10	10	10	10	7	3	
	2	10	10	10	10	7	3	
	3	10	10	10	10	7	3	
	4	10	10	10	10	7	3	
Red/Brown	1	0	0	0	0	0	0	0
Stains-Extremities/Snout	2	0	0	0	0	0	0	0
	3	0	0	0	0	0	0	0
	4	0	0	1	1	0	0	1

TABLE 3

PROPANE: A 2-WEEK RANGE-FINDING INHALATION TOXICITY
STUDY IN THE RAT VIA WHOLE-BODY EXPOSURES

MALES — MEAN BODY WEIGHTS (GRAMS)

		DOSE GROUP:	1	2	3	4
		DOSE LEVEL (PPM):	0	120	1200	12000
DAY	-7	MEAN	234	234	234	234
		S.D.	9.5	8.2	7.4	8.3
		N	10	10	10	10
DAY	0	MEAN	288	279	283	282
		S.D.	14.2	10.4	10.6	10.4
		N	10	10	10	10
DAY	7	MEAN	323	297**	308	302**
		S.D.	18.8	13.8	9.8	12.5
		N	10	10	10	10
DAY	13	MEAN	348	310**	328*	318**
		S.D.	24.1	16.1	14.8	13.2
		N	10	10	10	10

Statistical key: * = p<0.05 ** = p<0.01

TABLE 3

PROPANE: A 2-WEEK RANGE-FINDING INHALATION TOXICITY
STUDY IN THE RAT VIA WHOLE-BODY EXPOSURES

FEMALES — MEAN BODY WEIGHTS (GRAMS)

	DOSE GROUP:	1	2	3	4
	DOSE LEVEL (PPM):	0	120	1200	12000
DAY -7	MEAN	176	175	174	175
	S.D.	8.7	8.4	8.0	8.3
	N	10	10	10	10
DAY 0	MEAN	196	195	191	193
	S.D.	11.4	12.0	11.7	11.8
	N	10	10	10	10
DAY 7	MEAN	213	207	210	211
	S.D.	13.0	12.6	10.3	13.8
	N	10	10	10	10
DAY 13	MEAN	230	224	229	225
	S.D.	14.4	16.9	13.2	17.2
	N	10	10	10	10

No statistically significant differences

TABLE 4

PROPANE: A 2-WEEK RANGE-FINDING INHALATION TOXICITY
STUDY IN THE RAT VIA WHOLE-BODY EXPOSURES

MALES — MEAN BODY WEIGHT CHANGE FROM BASELINE (GRAMS)

DOSE GROUP:			1	2	3	4
DOSE LEVEL (PPM):			0	120	1200	12000
DAY 0 TO 7		MEAN	35	19**	25**	20**
		S.D.	6.4	6.6	6.8	7.8
		N	10	10	10	10
DAY 0 TO 13		MEAN	60	32**	45*	37**
		S.D.	13.5	10.5	12.1	11.7
		N	10	10	10	10

Statistical key: * = p<0.05 ** = p<0.01

TABLE 4

PROPANE: A 2-WEEK RANGE-FINDING INHALATION TOXICITY
STUDY IN THE RAT VIA WHOLE-BODY EXPOSURES

FEMALES — MEAN BODY WEIGHT CHANGE FROM BASELINE (GRAMS)

		DOSE GROUP:	1	2	3	4
		DOSE LEVEL (PPM):	0	120	1200	12000
DAY	0 TO 7	MEAN	17	13	19	18
		S.D.	7.5	6.5	9.1	4.4
		N	10	10	10	10
DAY	0 TO 13	MEAN	34	29	38	33
		S.D.	8.3	11.9	9.2	8.8
		N	10	10	10	10

No statistically significant differences

TABLE 5

PROPANE: A 2-WEEK RANGE-FINDING INHALATION TOXICITY
STUDY IN THE RAT VIA WHOLE-BODY EXPOSURES

MALES — MEAN FEED CONSUMPTION VALUES (GRAMS/KG/DAY)

	DOSE GROUP:	1	2	3	4
	DOSE LEVEL (PPM):	0	120	1200	12000
DAY 0	MEAN	93	91	91	89
	S.D.	5.2	2.4	3.6	2.6
	N	10	10	10	10
DAY 7	MEAN	80	79	80	78
	S.D.	3.8	3.3	3.9	3.7
	N	10	10	10	10
DAY 13	MEAN	69	70	68	69
	S.D.	3.0	3.9	3.5	3.2
	N	10	10	10	10

No statistically significant differences

TABLE 5

PROPANE: A 2-WEEK RANGE-FINDING INHALATION TOXICITY
STUDY IN THE RAT VIA WHOLE-BODY EXPOSURES

FEMALES — MEAN FEED CONSUMPTION VALUES (GRAMS/KG/DAY)

DOSE GROUP:		1	2	3	4
DOSE LEVEL (PPM):		0	120	1200	12000
DAY 0	MEAN	91	92	92	91
	S.D.	4.6	5.9	4.0	3.0
	N	10	8	10	9
DAY 7	MEAN	87	86	88	89
	S.D.	4.7	4.6	3.7	3.2
	N	9	9	10	10
DAY 13	MEAN	83	86	84	85
	S.D.	3.3	5.8	2.8	4.4
	N	10	10	10	10

No statistically significant differences

	Mean Organ Weights Preface	Table 6

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Key to Abbreviations:

g = Grams
wt. = Weight
observ. = Observed

Corresponding exposure levels for each group were as follows:

Group 1 - 0 ppm
Group 2 - 120 ppm
Group 3 - 1200 ppm
Group 4 - 12000 ppm

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Group	Terminal Body wt. (g)	Adrenal Glands	Brain	Epididymides	Heart	Kidneys	Liver	Lungs
				Male Animals				
1								
Mean:	319.7	0.0610	2.0193	0.9321	1.2137	2.9496	10.7381	1.7557
Standard deviation:	22.3	0.0107	0.1319	0.0806	0.1193	0.2622	1.2336	0.2030
Number of observ. :	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)
2								
Mean:	286.0+	0.0582	2.0578	0.9268	1.1138	2.9009	10.0949	1.6431
Standard deviation:	14.7	0.0094	0.1047	0.1278	0.1148	0.3359	1.2880	0.2565
Number of observ. :	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)
3								
Mean:	301.8*	0.0598	2.0179	0.9030	1.1495	2.8364	9.9879	1.7763
Standard deviation:	12.7	0.0090	0.1061	0.0781	0.0881	0.2604	0.9177	0.3291
Number of observ. :	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)
4								
Mean:	295.8+	0.0562	2.0486	0.8969	1.1624	2.9433	10.2117	1.9319
Standard deviation:	13.0	0.0083	0.1398	0.0731	0.0903	0.1263	0.8851	0.3634
Number of observ. :	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)

*(+) = mean value of group was significantly different from control at P = 0.05(0.01) with Dunnett's test of significance
%($) = mean value of group was significantly different from control at P = 0.05(0.01) with Modified T test of significance

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Group	Terminal Body wt. (g)	Pituitary gland	Seminal vesicles	Spleen	Testes	Thymus
			M a l e A n i m a l s			
1						
M e a n:	319.7	0.0101	1.2912	0.6487	3.0829	0.5657
Standard deviation:	22.3	0.0020	0.2318	0.0499	0.2696	0.0484
Number of observ. :	(10)	(10)	(10)	(10)	(10)	(10)
2						
M e a n:	286.0+	0.0094	1.3699	0.5831	2.9318	0.4516+
Standard deviation:	14.7	0.0018	0.5031	0.0556	0.3298	0.0675
Number of observ. :	(10)	(10)	(10)	(10)	(10)	(10)
3						
M e a n:	301.8*	0.0091	1.1833	0.6279	3.1171	0.5074
Standard deviation:	12.7	0.0014	0.2538	0.1095	0.2206	0.0707
Number of observ. :	(10)	(10)	(10)	(10)	(10)	(10)
4						
M e a n:	295.8+	0.0079*	1.2966	0.6157	3.0210	0.4660+
Standard deviation:	13.0	0.0024	0.1645	0.0841	0.3076	0.0773
Number of observ. :	(10)	(10)	(10)	(10)	(10)	(10)

*(+) = mean value of group was significantly different from control at P = 0.05(0.01) with Dunnett's test of significance
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Group	Terminal Body wt. (g)	Adrenal Glands	Brain	Heart	Kidneys	Liver	Lungs	Ovaries
				Female Animals				
1								
Mean:	213.1	0.0730	1.9830	0.8345	2.0818	7.8122	1.4719	0.1047
Standard deviation:	11.5	0.0081	0.0741	0.0907	0.1765	0.9224	0.2293	0.0166
Number of observ. :	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)
2								
Mean:	205.9	0.0704	1.9770	0.8299	2.0477	7.8243	1.3966	0.0990
Standard deviation:	16.7	0.0122	0.1074	0.0422	0.1631	1.2428	0.1878	0.0152
Number of observ. :	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)
3								
Mean:	210.3	0.0746	1.9896	0.8256	2.0596	7.9535	1.4575	0.1038
Standard deviation:	10.6	0.0106	0.0988	0.0681	0.1769	0.8444	0.2181	0.0213
Number of observ. :	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)
4								
Mean:	205.8	0.0733	1.9288	0.8350	2.0670	7.7006	1.3767	0.0954
Standard deviation:	14.7	0.0096	0.0973	0.0854	0.1804	0.9770	0.1847	0.0268
Number of observ. :	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)

*(+) = mean value of group was significantly different from control at P = 0.05(0.01) with Dunnett's test of significance
%($) = mean value of group was significantly different from control at P = 0.05(0.01) with Modified T test of significance

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Group	Terminal Body wt. (g)	Pituitary gland	Spleen	Thymus	Uterus
			Female Animals		
1					
Mean:	213.1	0.0123	0.5473	0.4752	0.6516
Standard deviation:	11.5	0.0027	0.0642	0.0749	0.1358
Number of observ. :	(10)	(10)	(10)	(10)	(10)
2					
Mean:	205.9	0.0110	0.5269	0.5131	0.6665
Standard deviation:	16.7	0.0030	0.0805	0.0924	0.2537
Number of observ. :	(10)	(10)	(10)	(10)	(10)
3					
Mean:	210.3	0.0106	0.4924	0.5063	0.5786
Standard deviation:	10.6	0.0030	0.0748	0.1376	0.0835
Number of observ. :	(10)	(10)	(10)	(10)	(10)
4					
Mean:	205.8	0.0128	0.4826	0.4709	0.5908
Standard deviation:	14.7	0.0013	0.0765	0.1004	0.1460
Number of observ. :	(10)	(10)	(10)	(10)	(10)

*(+) = mean value of group was significantly different from control at P = 0.05(0.01) with Dunnett's test of significance
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Group	Terminal Body wt. (g)	Adrenal Glands	Brain	Epididymides	Heart	Kidneys	Liver	Lungs
				Male Animals				
1								
Mean:	319.7	0.0191	0.6332	0.2928	0.3795	0.9226	3.3546	0.5489
Standard deviation:	22.3	0.0034	0.0437	0.0318	0.0251	0.0486	0.2632	0.0487
Number of observ. :	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)
2								
Mean:	286.0+	0.0203	0.7211+	0.3242	0.3893	1.0151%	3.5283	0.5749
Standard deviation:	14.7	0.0030	0.0500	0.0431	0.0326	0.1087	0.3902	0.0866
Number of observ. :	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)
3								
Mean:	301.8*	0.0198	0.6702	0.2996	0.3814	0.9418	3.3114	0.5908
Standard deviation:	12.7	0.0029	0.0508	0.0270	0.0317	0.1002	0.2887	0.1185
Number of observ. :	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)
4								
Mean:	295.8+	0.0190	0.6934*	0.3036	0.3927	0.9966%	3.4498	0.6522
Standard deviation:	13.0	0.0030	0.0493	0.0256	0.0178	0.0554	0.2099	0.1109
Number of observ. :	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)

*(+) = mean value of group was significantly different from control at P = 0.05(0.01) with Dunnett's test of significance
%($) = mean value of group was significantly different from control at P = 0.05(0.01) with Modified T test of significance

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Group	Terminal Body wt. (g)	Pituitary gland	Seminal vesicles	Spleen	Testes	Thymus
			Male Animals			
1						
Mean:	319.7	0.0031	0.4067	0.2033	0.9691	0.1775
Standard deviation:	22.3	0.0005	0.0840	0.0158	0.1174	0.0182
Number of observ. :	(10)	(10)	(10)	(10)	(10)	(10)
2						
Mean:	286.0+	0.0033	0.4754	0.2045	1.0256	0.1578
Standard deviation:	14.7	0.0006	0.1584	0.0233	0.1110	0.0214
Number of observ. :	(10)	(10)	(10)	(10)	(10)	(10)
3						
Mean:	301.8*	0.0030	0.3944	0.2088	1.0338	0.1683
Standard deviation:	12.7	0.0005	0.0933	0.0407	0.0743	0.0240
Number of observ. :	(10)	(10)	(10)	(10)	(10)	(10)
4						
Mean:	295.8+	0.0027	0.4403	0.2079	1.0235	0.1574
Standard deviation:	13.0	0.0008	0.0657	0.0245	0.1177	0.0241
Number of observ. :	(10)	(10)	(10)	(10)	(10)	(10)

*(+) = mean value of group was significantly different from control at P = 0.05(0.01) with Dunnett's test of significance
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Group	Terminal Body wt. (g)	Adrenal Glands	Brain	Heart	Kidneys	Liver	Lungs	Ovaries
				Female Animals				
1								
Mean:	213.1	0.0343	0.9331	0.3913	0.9781	3.6700	0.6913	0.0491
Standard deviation:	11.5	0.0040	0.0634	0.0338	0.0827	0.4241	0.1101	0.0071
Number of observ. :	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)
2								
Mean:	205.9	0.0342	0.9645	0.4045	0.9968	3.7892	0.6793	0.0480
Standard deviation:	16.7	0.0053	0.0798	0.0264	0.0724	0.4671	0.0829	0.0062
Number of observ. :	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)
3								
Mean:	210.3	0.0355	0.9474	0.3925	0.9794	3.7784	0.6926	0.0494
Standard deviation:	10.6	0.0049	0.0483	0.0235	0.0667	0.2955	0.0893	0.0099
Number of observ. :	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)
4								
Mean:	205.8	0.0356	0.9404	0.4055	1.0058	3.7359	0.6703	0.0461
Standard deviation:	14.7	0.0036	0.0651	0.0253	0.0704	0.3156	0.0854	0.0105
Number of observ. :	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)

*(+) = mean value of group was significantly different from control at P = 0.05(0.01) with Dunnett's test of significance
%($) = mean value of group was significantly different from control at P = 0.05(0.01) with Modified T test of significance

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Group	Terminal Body wt. (g)	Pituitary gland	Spleen	Thymus	Uterus
			Female Animals		
1					
Mean:	213.1	0.0058	0.2576	0.2228	0.3071
Standard deviation:	11.5	0.0013	0.0352	0.0323	0.0689
Number of observ. :	(10)	(10)	(10)	(10)	(10)
2					
Mean:	205.9	0.0053	0.2560	0.2498	0.3278
Standard deviation:	16.7	0.0013	0.0338	0.0429	0.1371
Number of observ. :	(10)	(10)	(10)	(10)	(10)
3					
Mean:	210.3	0.0050	0.2337	0.2393	0.2750
Standard deviation:	10.6	0.0014	0.0305	0.0574	0.0344
Number of observ. :	(10)	(10)	(10)	(10)	(10)
4					
Mean:	205.8	0.0062	0.2341	0.2278	0.2856
Standard deviation:	14.7	0.0008	0.0303	0.0364	0.0548
Number of observ. :	(10)	(10)	(10)	(10)	(10)

*(+) = mean value of group was significantly different from control at P = 0.05(0.01) with Dunnett's test of significance
%($) = mean value of group was significantly different from control at P = 0.05(0.01) with Modified T test of significance

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Group	Terminal Body wt. (g)	Adrenal Glands	Brain	Epididymides	Heart	Kidneys	Liver	Lungs
				Male Animals				
1								
Mean:	319.7	3.0154	100.0000	46.2928	60.0517	146.1030	531.7206	86.8390
Standard deviation:	22.3	0.4504	0.0000	4.5549	3.6442	9.5181	50.7075	7.0006
Number of observ. :	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)
2								
Mean:	286.0+	2.8334	100.0000	44.8865	54.1219*	140.7531	490.8161	79.6092
Standard deviation:	14.7	0.4583	0.0000	4.2653	4.7683	11.4741	58.4035	9.6569
Number of observ. :	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)
3								
Mean:	301.8*	2.9698	100.0000	44.7796	57.0002	140.6348	495.1787	87.7055
Standard deviation:	12.7	0.4700	0.0000	3.4216	3.7532	11.3800	40.8284	13.0886
Number of observ. :	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)
4								
Mean:	295.8+	2.7725	100.0000	43.9010	56.9208	144.1069	499.6327	94.0925
Standard deviation:	13.0	0.5752	0.0000	3.8726	5.0007	8.7392	43.8091	14.9439
Number of observ. :	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)

*(+) = mean value of group was significantly different from control at P = 0.05(0.01) with Dunnett's test of significance
%($) = mean value of group was significantly different from control at P = 0.05(0.01) with Modified T test of significance

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Summary Statistics for % Organ to Brain Weight
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Group	Terminal Body wt. (g)	Pituitary gland	Seminal vesicles	Spleen	Testes	Thymus
			M a l e A n i m a l s			
1						
M e a n:	319.7	0.4967	64.0984	32.1490	152.9507	28.1114
Standard deviation:	22.3	0.0818	11.5959	1.9102	13.7757	2.9611
Number of observ. :	(10)	(10)	(10)	(10)	(10)	(10)
2						
M e a n:	286.0+	0.4568	66.0103	28.3318$	142.2636	21.9674+
Standard deviation:	14.7	0.0736	21.6152	2.2469	12.4151	3.2089
Number of observ. :	(10)	(10)	(10)	(10)	(10)	(10)
3						
M e a n:	301.8*	0.4525	58.7155	31.0693	154.8308	25.2404
Standard deviation:	12.7	0.0744	12.4033	4.7793	13.3724	4.0064
Number of observ. :	(10)	(10)	(10)	(10)	(10)	(10)
4						
M e a n:	295.8+	0.3857*	63.4500	30.0543	147.6016	22.8489+
Standard deviation:	13.0	0.1114	8.1215	3.5914	12.8566	4.0197
Number of observ. :	(10)	(10)	(10)	(10)	(10)	(10)

*(+) = mean value of group was significantly different from control at P = 0.05(0.01) with Dunnett's test of significance
%($) = mean value of group was significantly different from control at P = 0.05(0.01) with Modified T test of significance

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Group	Terminal Body wt. (g)	Adrenal Glands	Brain	Heart	Kidneys	Liver	Lungs	Ovaries
			Female Animals					
1								
Mean:	213.1	3.6875	100.0000	42.0686	105.1090	393.7946	74.2643	5.2825
Standard deviation:	11.5	0.4295	0.0000	4.1810	9.8350	43.1164	11.5604	0.8533
Number of observ. :	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)
2								
Mean:	205.9	3.5615	100.0000	42.0152	103.6929	396.5182	70.5526	5.0085
Standard deviation:	16.7	0.6114	0.0000	1.6537	8.1682	65.3991	7.6804	0.7689
Number of observ. :	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)
3								
Mean:	210.3	3.7624	100.0000	41.4758	103.6056	399.6359	73.1578	5.2132
Standard deviation:	10.6	0.5796	0.0000	2.4458	8.3604	36.2210	9.2626	1.0209
Number of observ. :	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)
4								
Mean:	205.8	3.8012	100.0000	43.3159	107.2660	399.0601	71.5144	4.9418
Standard deviation:	14.7	0.4585	0.0000	4.0928	8.8047	44.2424	9.8953	1.2845
Number of observ. :	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(10)

*(+) = mean value of group was significantly different from control at P = 0.05(0.01) with Dunnett's test of significance
%($) = mean value of group was significantly different from control at P = 0.05(0.01) with Modified T test of significance

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Summary Statistics for % Organ to Brain Weight
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Group	Terminal Body wt. (g)	Pituitary gland	Spleen	Thymus	Uterus
			Female Animals		
1					
Mean:	213.1	0.6220	27.6191	24.0033	32.9549
Standard deviation:	11.5	0.1386	3.1757	4.0543	7.2193
Number of observ. :	(10)	(10)	(10)	(10)	(10)
2					
Mean:	205.9	0.5559	26.7053	25.9920	33.5043
Standard deviation:	16.7	0.1447	4.1442	4.7452	11.8217
Number of observ. :	(10)	(10)	(10)	(10)	(10)
3					
Mean:	210.3	0.5306	24.7058	25.3547	29.0077
Standard deviation:	10.6	0.1453	3.2950	6.3841	3.1620
Number of observ. :	(10)	(10)	(10)	(10)	(10)
4					
Mean:	205.8	0.6646	25.0496	24.3270	30.5426
Standard deviation:	14.7	0.0822	3.9697	4.2958	6.5753
Number of observ. :	(10)	(10)	(10)	(10)	(10)

*(+) = mean value of group was significantly different from control at P = 0.05(0.01) with Dunnett's test of significance
%($) = mean value of group was significantly different from control at P = 0.05(0.01) with Modified T test of significance

	Incidence Summary Report for Gross Necropsy Observations Preface	Table 7

Key to Abbreviations

LN	=	Lymph Node
Submandib/Max	=	Submandibular/Submaxillary

Corresponding exposure levels for each group were as follows:

Group 1 - 0 ppm
Group 2 - 120 ppm
Group 3 - 1200 ppm
Group 4 - 12000 ppm

Huntingdon Life Sciences
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Incidence Summary Report for Gross Necropsy Observations
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	-- Males --				-- Females --			
Group:	1	2	3	4	1	2	3	4
Number in group:	10	10	10	10	10	10	10	10
Within normal limits	7	9	10	10	8	8	7	9
Epididymides								
Cyst	1	0	0	0	0	0	0	0
Ileum								
Abnormal Contents	0	0	0	0	1	1	1	1
Jejunum								
Abnormal Contents	0	0	0	0	0	0	1	0
Kidneys								
Dilated Pelvis	0	0	0	0	1	0	0	0
Liver								
Hernia	0	0	0	0	0	0	1	0
Lungs								
Discolored	1	0	0	0	0	0	0	0
Spleen								
Irregular Surface	0	0	0	0	0	0	1	0
Submandib/Max LN								
Enlarged	0	0	0	0	0	1	2	0
Thymus								
Discolored	0	0	0	0	0	1	1	1
Urinary bladder								
Distended	1	0	0	0	0	0	0	0
Uterus								
Distended	0	0	0	0	0	1	0	0
Skin (other)								
Hair Thin/Absent	0	1	0	0	0	0	0	0
Lymph Node,other								
Discolored	0	0	0	0	0	0	1	0

Chamber Monitoring Results
Cumulative Exposure Record
Group 1 - 0 ppm (air only)

Day	Date	Exposure Number	Analytical Chamber Concentration					Particle Size Determinations			Chamber Environment	
			Nominal (ppm)	Mean (ppm)	Individual (ppm)			MMAD (µm)	GSD	TMC (mg/m^3)	Mean Temperature (°C)	Humidity (%)
0	14-Aug-03	1	-	0.00	0.00	0.00	0.00	0.9961	2.326	5.58E-03	23	54
1	15-Aug-03	2	-	0.00	0.00	0.00	0.00	5.093	2.855	4.37E-03	23	57
2	16-Aug-03	3	-	0.00	0.00	0.00	0.00	0.7966	1.841	6.97E-03	23	57
3	17-Aug-03	4	-	0.00	0.00	0.00	0.00	0.7871	1.606	8.77E-03	23	57
4	18-Aug-03	5	-	0.00	0.00	0.00	0.00	0.8721	1.960	2.63E-03	23	57
5	19-Aug-03	6	-	0.00	0.00	0.00	0.00	0.8652	1.752	2.92E-03	23	57
6	20-Aug-03	7	-	0.00	0.00	0.00	0.00	0.8637	2.137	5.10E-03	23	55
7	21-Aug-03	8	-	0.00	0.00	0.00	0.00	0.8375	1.786	1.28E-02	23	58
8	22-Aug-03	9	-	0.00	0.00	0.00	0.00	0.8030	1.356	1.85E-02	23	60
9	23-Aug-03	10	-	0.00	0.00	0.00	0.00	1.741	1.868	1.22E-03	23	56
10	24-Aug-03	11	-	0.00	0.00	0.00	0.00	1.727	1.826	7.42E-04	24	60
11	25-Aug-03	12	-	0.00	0.00	0.00	0.00	2.855	2.401	1.84E-03	23	58
12	26-Aug-03	13	-	0.00	0.00	0.00	0.00	0.9191	2.159	3.85E-03	23	56
13	27-Aug-03	14	-	0.00	0.00	0.00	0.00	1.333	3.418	6.43E-03	23	56
14	28-Aug-03	15	-	0.00	0.00	0.00	0.00	1.450	2.007	1.40E-03	22	57
		Mean	-		**0.00**			**1.463**	**2.087**	**5.54E-03**	**23**	**57**
		S.D.	-		**0.00**			**1.152**	**0.514**	**4.83E-03**	**0**	**2**

Chamber Monitoring Results
Cumulative Exposure Record
Group 2 - 120 ppm

Day	Date	Exposure Number	Analytical Chamber Concentration						Particle Size Determinations			Chamber Environment	
			Nominal (ppm)	Mean (ppm)	Individual (ppm)				MMAD (µm)	GSD	TMC (mg/m^3)	Mean Temperature (°C)	Humidity (%)
0	14-Aug-03	1	120	118.5	123	117	117	117	2.127	2.868	6.89E-03	23	54
1	15-Aug-03	2	120	126.8	132	118	132	125	1.002	2.005	2.49E-03	23	55
2	16-Aug-03	3	120	118.0	110	117	117	128	0.7932	1.641	6.33E-03	23	54
3	17-Aug-03	4	120	125.0	125	123	126	126	0.7920	1.533	8.73E-03	23	54
4	18-Aug-03	5	122	113.5	115	87.0	132	120	0.9256	2.092	2.80E-03	23	54
5	19-Aug-03	6	124	126.3	125	112	118	150	1.245	2.474	3.80E-03	23	55
6	20-Aug-03	7	124	129.3	132	118	128	139	0.9955	2.746	6.05E-03	23	55
7	21-Aug-03	8	124	120.0	121	120	114	125	0.8376	1.915	1.24E-02	23	54
8	22-Aug-03	9	124	122.5	118	120	120	132	0.8247	2.398	2.09E-02	23	56
9	23-Aug-03	10	124	122.5	129	115	121	125	2.966	2.182	1.82E-03	23	54
10	24-Aug-03	11	124	117.5	117	121	109	123	4.269	2.188	2.01E-03	23	58
11	25-Aug-03	12	124	118.5	110	120	121	123	1.285	1.659	8.77E-04	23	56
12	26-Aug-03	13	124	123.5	125	117	132	120	0.8853	2.095	3.36E-03	23	55
13	27-Aug-03	14	124	121.0	112	126	115	131	0.7987	1.798	4.08E-03	23	54
14	28-Aug-03	15	124	127.3	131	128	125	125	1.2150	1.868	1.05E-03	21	57
		Mean	**123**		**122.0**				**1.397**	**2.097**	**5.57E-03**	**23**	**55**
		S.D.	**2**		**8.7**				**0.994**	**0.393**	**5.27E-03**	**1**	**1**

Chamber Monitoring Results
Cumulative Exposure Record
Group 3 - 1200 ppm

Day	Date	Exposure Number	Analytical Chamber Concentration						Particle Size Determinations			Chamber Environment Mean	
			Nominal (ppm)	Mean (ppm)	Individual (ppm)				MMAD (µm)	GSD	TMC (mg/m^3)	Temperature (°C)	Humidity (%)
0	14-Aug-03	1	1190	1320	1620	1180	1220	1260	1.278	2.675	5.71E-03	22	54
1	15-Aug-03	2	1130	1325	1380	1360	1290	1270	1.207	1.986	2.95E-03	22	56
2	16-Aug-03	3	1040	1218	1200	1230	1220	1220	0.8037	1.783	7.33E-03	22	56
3	17-Aug-03	4	1040	1260	1220	1250	1290	1280	0.8984	2.938	1.42E-02	22	55
4	18-Aug-03	5	1040	1185	1150	1180	1220	1190	0.8018	1.607	2.16E-03	22	55
5	19-Aug-03	6	1040	1183	1160	1180	1180	1210	1.050	2.102	3.97E-03	22	56
6	20-Aug-03	7	1070	1143	1140	1090	1150	1190	0.8528	2.076	5.00E-03	22	55
7	21-Aug-03	8	1100	1280	1270	1290	1310	1250	0.8307	1.582	1.22E-02	22	54
8	22-Aug-03	9	1100	1208	1180	1220	1210	1220	0.8095	1.608	2.07E-02	22	56
9	23-Aug-03	10	1100	1265	1240	1250	1280	1290	1.572	2.159	1.10E-03	22	56
10	24-Aug-03	11	1100	1215	1220	1220	1200	1220	2.313	1.974	1.03E-03	23	58
11	25-Aug-03	12	1100	1198	1180	1190	1210	1210	1.488	1.997	1.01E-03	22	56
12	26-Aug-03	13	1100	1253	1210	1230	1290	1280	0.9615	2.593	3.97E-03	22	55
13	27-Aug-03	14	1100	1213	1210	1160	1230	1250	0.8929	2.364	5.78E-03	22	54
14	28-Aug-03	15	1100	1183	1230	1210	1130	1160	3.454	2.773	1.64E-03	21	56
		Mean	**1090**		**1230**				**1.281**	**2.148**	**5.92E-03**	**22**	**55**
		S.D.	**40**		**74**				**0.729**	**0.436**	**5.67E-03**	**0**	**1**

Chamber Monitoring Results
Cumulative Exposure Record
Group 4 - 12000 ppm

Day	Date	Exposure Number	Analytical Chamber Concentration						Particle Size Determinations			Chamber Environment	
			Nominal	Mean	Individual				MMAD	GSD	TMC	Mean Temperature	Humidity
			(ppm)	(ppm)	(ppm)				(µm)		(mg/m^3)	(°C)	(%)
0	14-Aug-03	1	11300	12530	12400	12700	12500	12500	0.8546	1.828	3.92E-03	22	58
1	15-Aug-03	2	11300	12330	12400	12400	12200	12300	0.8631	1.851	2.11E-03	22	61
2	16-Aug-03	3	11300	12300	12300	12300	12200	12400	0.7686	1.452	6.51E-03	22	60
3	17-Aug-03	4	11300	12350	12200	12300	12400	12500	0.7870	1.570	7.91E-03	22	60
4	18-Aug-03	5	11300	12400	12100	12500	12500	12500	0.8941	1.942	2.86E-03	22	60
5	19-Aug-03	6	11300	12280	12400	12300	12000	12400	0.8558	1.695	2.79E-03	22	60
6	20-Aug-03	7	11300	12100	12300	12000	12000	12100	0.8317	1.770	4.63E-03	22	59
7	21-Aug-03	8	11300	12380	12400	12500	12500	12100	0.8320	1.429	1.16E-02	22	59
8	22-Aug-03	9	11300	11880	11700	11800	11900	12100	0.8086	1.413	2.01E-02	22	61
9	23-Aug-03	10	11300	12380	12300	12300	12400	12500	1.583	2.023	1.07E-03	22	59
10	24-Aug-03	11	11300	11900	12000	11800	11900	11900	2.434	2.178	8.57E-04	23	63
11	25-Aug-03	12	11300	11600	11600	11600	11600	11600	1.871	2.081	1.38E-03	22	60
12	26-Aug-03	13	11300	12180	11800	12100	12400	12400	0.8547	1.783	3.54E-03	22	60
13	27-Aug-03	14	11300	12000	12000	12000	12000	12000	0.9045	2.522	5.93E-03	22	59
14	28-Aug-03	15	11300	12400	12800	12600	12100	12100	1.990	2.254	1.54E-03	21	60
		Mean	**11300**		**12198**				**1.142**	**1.853**	**5.12E-03**	**22**	**60**
		S.D.	**0**		**289**				**0.543**	**0.322**	**5.07E-03**	**0**	**1**

APPENDIX B

PROPANE: A 2-WEEK RANGE-FINDING INHALATION TOXICITY
STUDY IN THE RAT VIA WHOLE-BODY EXPOSURES

ANIMAL TERMINATION HISTORY

MALES GROUP 1 0 PPM

ANIMAL#	TYPE OF DEATH	DATE OF DEATH	WEEK OF STUDY	STUDY DAY
1026	Terminal Sacrifice	28-AUG-03	3	14
1027	Terminal Sacrifice	28-AUG-03	3	14
1028	Terminal Sacrifice	28-AUG-03	3	14
1029	Terminal Sacrifice	28-AUG-03	3	14
1030	Terminal Sacrifice	28-AUG-03	3	14
1031	Terminal Sacrifice	28-AUG-03	3	14
1032	Terminal Sacrifice	28-AUG-03	3	14
1033	Terminal Sacrifice	28-AUG-03	3	14
1034	Terminal Sacrifice	29-AUG-03	3	15
1035	Terminal Sacrifice	29-AUG-03	3	15

APPENDIX B

PROPANE: A 2-WEEK RANGE-FINDING INHALATION TOXICITY
STUDY IN THE RAT VIA WHOLE-BODY EXPOSURES

ANIMAL TERMINATION HISTORY

MALES GROUP 2 120 PPM

ANIMAL#	TYPE OF DEATH	DATE OF DEATH	WEEK OF STUDY	STUDY DAY
2026	Terminal Sacrifice	28-AUG-03	3	14
2027	Terminal Sacrifice	28-AUG-03	3	14
2028	Terminal Sacrifice	28-AUG-03	3	14
2029	Terminal Sacrifice	28-AUG-03	3	14
2030	Terminal Sacrifice	28-AUG-03	3	14
2031	Terminal Sacrifice	28-AUG-03	3	14
2032	Terminal Sacrifice	28-AUG-03	3	14
2033	Terminal Sacrifice	28-AUG-03	3	14
2034	Terminal Sacrifice	29-AUG-03	3	15
2035	Terminal Sacrifice	29-AUG-03	3	15

APPENDIX B

PROPANE: A 2-WEEK RANGE-FINDING INHALATION TOXICITY
STUDY IN THE RAT VIA WHOLE-BODY EXPOSURES

ANIMAL TERMINATION HISTORY

MALES GROUP 3 1200 PPM

ANIMAL#	TYPE OF DEATH	DATE OF DEATH	WEEK OF STUDY	STUDY DAY
3026	Terminal Sacrifice	28-AUG-03	3	14
3027	Terminal Sacrifice	28-AUG-03	3	14
3028	Terminal Sacrifice	28-AUG-03	3	14
3029	Terminal Sacrifice	28-AUG-03	3	14
3030	Terminal Sacrifice	28-AUG-03	3	14
3031	Terminal Sacrifice	28-AUG-03	3	14
3032	Terminal Sacrifice	28-AUG-03	3	14
3033	Terminal Sacrifice	28-AUG-03	3	14
3034	Terminal Sacrifice	29-AUG-03	3	15
3035	Terminal Sacrifice	29-AUG-03	3	15

APPENDIX B

PROPANE: A 2-WEEK RANGE-FINDING INHALATION TOXICITY
STUDY IN THE RAT VIA WHOLE-BODY EXPOSURES

ANIMAL TERMINATION HISTORY

MALES GROUP 4 12000 PPM

ANIMAL#	TYPE OF DEATH	DATE OF DEATH	WEEK OF STUDY	STUDY DAY
4026	Terminal Sacrifice	28-AUG-03	3	14
4027	Terminal Sacrifice	28-AUG-03	3	14
4028	Terminal Sacrifice	28-AUG-03	3	14
4029	Terminal Sacrifice	28-AUG-03	3	14
4030	Terminal Sacrifice	28-AUG-03	3	14
4031	Terminal Sacrifice	28-AUG-03	3	14
4032	Terminal Sacrifice	28-AUG-03	3	14
4033	Terminal Sacrifice	28-AUG-03	3	14
4034	Terminal Sacrifice	29-AUG-03	3	15
4035	Terminal Sacrifice	29-AUG-03	3	15

APPENDIX B

PROPANE: A 2-WEEK RANGE-FINDING INHALATION TOXICITY
STUDY IN THE RAT VIA WHOLE-BODY EXPOSURES

ANIMAL TERMINATION HISTORY

FEMALES GROUP 1 0 PPM

ANIMAL#	TYPE OF DEATH	DATE OF DEATH	WEEK OF STUDY	STUDY DAY
1526	Terminal Sacrifice	28-AUG-03	3	14
1527	Terminal Sacrifice	28-AUG-03	3	14
1528	Terminal Sacrifice	28-AUG-03	3	14
1529	Terminal Sacrifice	28-AUG-03	3	14
1530	Terminal Sacrifice	28-AUG-03	3	14
1531	Terminal Sacrifice	28-AUG-03	3	14
1532	Terminal Sacrifice	28-AUG-03	3	14
1533	Terminal Sacrifice	29-AUG-03	3	15
1534	Terminal Sacrifice	29-AUG-03	3	15
1535	Terminal Sacrifice	29-AUG-03	3	15

APPENDIX B

PROPANE: A 2-WEEK RANGE-FINDING INHALATION TOXICITY
STUDY IN THE RAT VIA WHOLE-BODY EXPOSURES

ANIMAL TERMINATION HISTORY

FEMALES GROUP 2 120 PPM

ANIMAL#	TYPE OF DEATH	DATE OF DEATH	WEEK OF STUDY	STUDY DAY
2526	Terminal Sacrifice	28-AUG-03	3	14
2527	Terminal Sacrifice	28-AUG-03	3	14
2528	Terminal Sacrifice	28-AUG-03	3	14
2529	Terminal Sacrifice	28-AUG-03	3	14
2530	Terminal Sacrifice	28-AUG-03	3	14
2531	Terminal Sacrifice	28-AUG-03	3	14
2532	Terminal Sacrifice	28-AUG-03	3	14
2533	Terminal Sacrifice	29-AUG-03	3	15
2534	Terminal Sacrifice	29-AUG-03	3	15
2535	Terminal Sacrifice	29-AUG-03	3	15

APPENDIX B

PROPANE: A 2-WEEK RANGE-FINDING INHALATION TOXICITY
STUDY IN THE RAT VIA WHOLE-BODY EXPOSURES

ANIMAL TERMINATION HISTORY

FEMALES GROUP 3 1200 PPM

ANIMAL#	TYPE OF DEATH	DATE OF DEATH	WEEK OF STUDY	STUDY DAY
3526	Terminal Sacrifice	28-AUG-03	3	14
3527	Terminal Sacrifice	28-AUG-03	3	14
3528	Terminal Sacrifice	28-AUG-03	3	14
3529	Terminal Sacrifice	28-AUG-03	3	14
3530	Terminal Sacrifice	28-AUG-03	3	14
3531	Terminal Sacrifice	28-AUG-03	3	14
3532	Terminal Sacrifice	28-AUG-03	3	14
3533	Terminal Sacrifice	29-AUG-03	3	15
3534	Terminal Sacrifice	29-AUG-03	3	15
3535	Terminal Sacrifice	29-AUG-03	3	15

APPENDIX B

PROPANE: A 2-WEEK RANGE-FINDING INHALATION TOXICITY
STUDY IN THE RAT VIA WHOLE-BODY EXPOSURES

ANIMAL TERMINATION HISTORY

FEMALES GROUP 4 12000 PPM

ANIMAL#	TYPE OF DEATH	DATE OF DEATH	WEEK OF STUDY	STUDY DAY
4526	Terminal Sacrifice	28-AUG-03	3	14
4527	Terminal Sacrifice	28-AUG-03	3	14
4528	Terminal Sacrifice	28-AUG-03	3	14
4529	Terminal Sacrifice	28-AUG-03	3	14
4530	Terminal Sacrifice	28-AUG-03	3	14
4531	Terminal Sacrifice	28-AUG-03	3	14
4532	Terminal Sacrifice	28-AUG-03	3	14
4533	Terminal Sacrifice	29-AUG-03	3	15
4534	Terminal Sacrifice	29-AUG-03	3	15
4535	Terminal Sacrifice	29-AUG-03	3	15

	Individual Clinical Observations Preface	Appendix C

For summarization purposes, descriptive comments [i.e., location of scab(s) and sore(s), etc.] are not presented in this appendix. These data are contained in the study raw data if needed.

APPENDIX C

PROPANE: A 2-WEEK RANGE-FINDING INHALATION TOXICITY
STUDY IN THE RAT VIA WHOLE-BODY EXPOSURES

INDIVIDUAL CLINICAL OBSERVATIONS

MALES GROUP 1 0 PPM

ANIMAL#	OBSERVATIONS	DAY OF STUDY - 7	0	7	1 3	1 4	1 5
1026	WITHIN NORMAL LIMITS	P	P	P	P		
	Terminal Sacrifice					P	
1027	WITHIN NORMAL LIMITS	P	P	P	P		
	Terminal Sacrifice					P	
1028	WITHIN NORMAL LIMITS	P	P	P	P		
	Terminal Sacrifice					P	
1029	WITHIN NORMAL LIMITS	P	P	P	P		
	Terminal Sacrifice					P	
1030	WITHIN NORMAL LIMITS	P	P	P	P		
	Terminal Sacrifice					P	
1031	WITHIN NORMAL LIMITS	P	P	P	P		
	Terminal Sacrifice					P	
1032	WITHIN NORMAL LIMITS	P	P	P	P		
	Terminal Sacrifice					P	
1033	WITHIN NORMAL LIMITS	P	P	P	P		
	Terminal Sacrifice					P	
1034	WITHIN NORMAL LIMITS	P	P	P	P		
	Terminal Sacrifice						P
1035	WITHIN NORMAL LIMITS	P	P	P	P		
	Terminal Sacrifice						P

CODE: 1-SLIGHT 2-MODERATE 3-MARKED P-PRESENT

APPENDIX C

PROPANE: A 2-WEEK RANGE-FINDING INHALATION TOXICITY
STUDY IN THE RAT VIA WHOLE-BODY EXPOSURES

INDIVIDUAL CLINICAL OBSERVATIONS

MALES GROUP 2 120 PPM

ANIMAL#	OBSERVATIONS	DAY OF STUDY - 7	0	7	3	4	5
2026	WITHIN NORMAL LIMITS	P	P	P	P		
	Terminal Sacrifice					P	
2027	WITHIN NORMAL LIMITS	P	P				
	Terminal Sacrifice					P	
	DERMAL GENERAL: Scab(s)			P	P		
2028	WITHIN NORMAL LIMITS	P	P	P	P		
	Terminal Sacrifice					P	
2029	WITHIN NORMAL LIMITS	P	P				
	Terminal Sacrifice					P	
	DERMAL GENERAL: Alopecia - Extremities/Snout			3	3		
2030	WITHIN NORMAL LIMITS	P	P	P	P		
	Terminal Sacrifice					P	
2031	WITHIN NORMAL LIMITS	P	P	P	P		
	Terminal Sacrifice					P	
2032	WITHIN NORMAL LIMITS	P	P	P	P		
	Terminal Sacrifice					P	
2033	WITHIN NORMAL LIMITS	P	P	P	P		
	Terminal Sacrifice					P	
2034	WITHIN NORMAL LIMITS	P	P	P	P		
	Terminal Sacrifice						P
2035	WITHIN NORMAL LIMITS	P	P				
	Terminal Sacrifice						P
	DERMAL GENERAL: Alopecia - Extremities/Snout			3	3		

CODE: 1-SLIGHT 2-MODERATE 3-MARKED P-PRESENT

APPENDIX C

PROPANE: A 2-WEEK RANGE-FINDING INHALATION TOXICITY
STUDY IN THE RAT VIA WHOLE-BODY EXPOSURES

INDIVIDUAL CLINICAL OBSERVATIONS

MALES GROUP 3 1200 PPM

ANIMAL#	OBSERVATIONS	DAY OF STUDY - 7	0	7	1 3	1 4	1 5
3026	WITHIN NORMAL LIMITS	P	P	P	P		
	Terminal Sacrifice					P	
3027	WITHIN NORMAL LIMITS	P	P	P	P		
	Terminal Sacrifice					P	
3028	WITHIN NORMAL LIMITS	P	P	P	P		
	Terminal Sacrifice					P	
3029	WITHIN NORMAL LIMITS	P	P	P	P		
	Terminal Sacrifice					P	
3030	WITHIN NORMAL LIMITS	P	P	P	P		
	Terminal Sacrifice					P	
3031	WITHIN NORMAL LIMITS	P	P	P	P		
	Terminal Sacrifice					P	
3032	WITHIN NORMAL LIMITS	P	P	P	P		
	Terminal Sacrifice					P	
3033	WITHIN NORMAL LIMITS	P	P	P	P		
	Terminal Sacrifice					P	
3034	WITHIN NORMAL LIMITS	P	P	P	P		
	Terminal Sacrifice						P
3035	WITHIN NORMAL LIMITS	P	P	P	P		
	Terminal Sacrifice						P

CODE: 1-SLIGHT 2-MODERATE 3-MARKED P-PRESENT

APPENDIX C

PROPANE: A 2-WEEK RANGE-FINDING INHALATION TOXICITY
STUDY IN THE RAT VIA WHOLE-BODY EXPOSURES

INDIVIDUAL CLINICAL OBSERVATIONS

MALES GROUP 4 12000 PPM

ANIMAL#	OBSERVATIONS	DAY OF STUDY - 7	0	7	3	4	1 1 5
4026	WITHIN NORMAL LIMITS	P	P	P			
	Terminal Sacrifice						P
	ORAL/BUCCAL: Nasal Discharge - Red					P	
4027	WITHIN NORMAL LIMITS	P	P	P	P		
	Terminal Sacrifice						P
4028	WITHIN NORMAL LIMITS	P	P	P	P		
	Terminal Sacrifice						P
4029	WITHIN NORMAL LIMITS	P	P				
	Terminal Sacrifice						P
	DERMAL GENERAL: Red/Brown Stains-Extremities/Snout				1	1	
4030	WITHIN NORMAL LIMITS	P	P	P	P		
	Terminal Sacrifice						P
4031	WITHIN NORMAL LIMITS	P	P	P			
	Terminal Sacrifice						P
	ORAL/BUCCAL: Nasal Discharge - Red					P	
4032	WITHIN NORMAL LIMITS	P	P				
	Terminal Sacrifice						P
	DERMAL GENERAL: Scab(s)				P		
	DERMAL GENERAL: Red/Brown Stains-Extremities/Snout				1	1	
4033	WITHIN NORMAL LIMITS	P	P				
	Terminal Sacrifice						P
	OCULAR: Chromodacryorrhea - Unilateral				P		
	OCULAR: Lacrimation - Unilateral				2		
	ORAL/BUCCAL: Incisors Maloccluded				P	P	

CODE: 1-SLIGHT 2-MODERATE 3-MARKED P-PRESENT

APPENDIX C

PROPANE: A 2-WEEK RANGE-FINDING INHALATION TOXICITY
STUDY IN THE RAT VIA WHOLE-BODY EXPOSURES

INDIVIDUAL CLINICAL OBSERVATIONS

MALES GROUP 4 12000 PPM

ANIMAL#	OBSERVATIONS	DAY OF STUDY - 7	0	7	3	4	1 1 5
4034	WITHIN NORMAL LIMITS	P	P				
	Terminal Sacrifice						P
	DERMAL GENERAL: Alopecia - Extremities/Snout				3	3	
4035	WITHIN NORMAL LIMITS	P	P	P	P		
	Terminal Sacrifice						P

CODE: 1-SLIGHT 2-MODERATE 3-MARKED P-PRESENT

APPENDIX C

PROPANE: A 2-WEEK RANGE-FINDING INHALATION TOXICITY
STUDY IN THE RAT VIA WHOLE-BODY EXPOSURES

INDIVIDUAL CLINICAL OBSERVATIONS

FEMALES GROUP 1 0 PPM

ANIMAL#	OBSERVATIONS	DAY OF STUDY - 7	0	7	3	4	11 5
1526	WITHIN NORMAL LIMITS	P	P	P	P		
	Terminal Sacrifice					P	
1527	WITHIN NORMAL LIMITS	P	P	P	P		
	Terminal Sacrifice					P	
1528	WITHIN NORMAL LIMITS	P	P	P	P		
	Terminal Sacrifice					P	
1529	WITHIN NORMAL LIMITS	P	P	P	P		
	Terminal Sacrifice					P	
1530	WITHIN NORMAL LIMITS	P	P	P	P		
	Terminal Sacrifice					P	
1531	WITHIN NORMAL LIMITS	P	P	P	P		
	Terminal Sacrifice					P	
1532	WITHIN NORMAL LIMITS	P	P	P	P		
	Terminal Sacrifice					P	
1533	WITHIN NORMAL LIMITS	P	P	P	P		
	Terminal Sacrifice						P
1534	WITHIN NORMAL LIMITS	P	P	P	P		
	Terminal Sacrifice						P
1535	WITHIN NORMAL LIMITS	P	P	P	P		
	Terminal Sacrifice						P

CODE: 1-SLIGHT 2-MODERATE 3-MARKED P-PRESENT

APPENDIX C

PROPANE: A 2-WEEK RANGE-FINDING INHALATION TOXICITY
STUDY IN THE RAT VIA WHOLE-BODY EXPOSURES

INDIVIDUAL CLINICAL OBSERVATIONS

FEMALES GROUP 2 120 PPM

ANIMAL#	OBSERVATIONS	DAY OF STUDY - 7	0	7	3	4	5
2526	WITHIN NORMAL LIMITS	P	P				
	Terminal Sacrifice						P
	DERMAL GENERAL: Scab(s)			P	P		
2527	WITHIN NORMAL LIMITS	P	P		P		
	Terminal Sacrifice						P
	DERMAL GENERAL: RED STAINS ON HEAD			1			
2528	WITHIN NORMAL LIMITS	P	P	P	P		
	Terminal Sacrifice						P
2529	WITHIN NORMAL LIMITS	P	P				
	Terminal Sacrifice						P
	DERMAL GENERAL: RED STAINS ON HEAD			1	1		
2530	WITHIN NORMAL LIMITS	P	P	P	P		
	Terminal Sacrifice						P
2531	WITHIN NORMAL LIMITS	P	P	P	P		
	Terminal Sacrifice						P
2532	WITHIN NORMAL LIMITS	P	P	P	P		
	Terminal Sacrifice						P
2533	WITHIN NORMAL LIMITS	P	P	P	P		
	Terminal Sacrifice						P
2534	WITHIN NORMAL LIMITS	P	P	P	P		
	Terminal Sacrifice						P
2535	WITHIN NORMAL LIMITS	P	P	P	P		
	Terminal Sacrifice						P

CODE: 1-SLIGHT 2-MODERATE 3-MARKED P-PRESENT

APPENDIX C

PROPANE: A 2-WEEK RANGE-FINDING INHALATION TOXICITY
STUDY IN THE RAT VIA WHOLE-BODY EXPOSURES

INDIVIDUAL CLINICAL OBSERVATIONS

FEMALES GROUP 3 1200 PPM

ANIMAL#	OBSERVATIONS	DAY OF STUDY - 7	0	7	1 3	1 4	1 5
3526	WITHIN NORMAL LIMITS	P	P	P	P		
	Terminal Sacrifice					P	
3527	WITHIN NORMAL LIMITS	P	P	P	P		
	Terminal Sacrifice					P	
3528	WITHIN NORMAL LIMITS	P	P				
	Terminal Sacrifice					P	
	DERMAL GENERAL: Alopecia - Extremities/Snout			2	2		
3529	WITHIN NORMAL LIMITS	P	P	P	P		
	Terminal Sacrifice					P	
3530	WITHIN NORMAL LIMITS	P	P	P	P		
	Terminal Sacrifice					P	
3531	WITHIN NORMAL LIMITS	P	P	P	P		
	Terminal Sacrifice					P	
3532	WITHIN NORMAL LIMITS	P	P	P	P		
	Terminal Sacrifice					P	
3533	WITHIN NORMAL LIMITS	P	P	P	P		
	Terminal Sacrifice						P
3534	WITHIN NORMAL LIMITS	P	P	P	P		
	Terminal Sacrifice						P
3535	WITHIN NORMAL LIMITS	P	P	P	P		
	Terminal Sacrifice						P

CODE: 1-SLIGHT 2-MODERATE 3-MARKED P-PRESENT

APPENDIX C

PROPANE: A 2-WEEK RANGE-FINDING INHALATION TOXICITY
STUDY IN THE RAT VIA WHOLE-BODY EXPOSURES

INDIVIDUAL CLINICAL OBSERVATIONS

FEMALES GROUP 4 12000 PPM

ANIMAL#	OBSERVATIONS	DAY OF STUDY - 7	0	7	1 3	1 4	1 5
4526	WITHIN NORMAL LIMITS	P					
	Terminal Sacrifice					P	
	DERMAL GENERAL: Scab(s)		P	P	P		
4527	WITHIN NORMAL LIMITS	P	P	P	P		
	Terminal Sacrifice					P	
4528	WITHIN NORMAL LIMITS	P	P	P	P		
	Terminal Sacrifice					P	
4529	WITHIN NORMAL LIMITS	P	P	P	P		
	Terminal Sacrifice					P	
4530	WITHIN NORMAL LIMITS	P	P				
	Terminal Sacrifice					P	
	DERMAL GENERAL: Red/Brown Stains-Extremities/Snout			1	1		
4531	WITHIN NORMAL LIMITS	P	P	P	P		
	Terminal Sacrifice					P	
4532	WITHIN NORMAL LIMITS	P	P	P	P		
	Terminal Sacrifice					P	
4533	WITHIN NORMAL LIMITS	P	P	P	P		
	Terminal Sacrifice						P
4534	WITHIN NORMAL LIMITS	P	P	P	P		
	Terminal Sacrifice						P
4535	WITHIN NORMAL LIMITS	P	P	P	P		
	Terminal Sacrifice						P

CODE: 1-SLIGHT 2-MODERATE 3-MARKED P-PRESENT

APPENDIX D

PROPANE: A 2-WEEK RANGE-FINDING INHALATION TOXICITY
STUDY IN THE RAT VIA WHOLE-BODY EXPOSURES

INDIVIDUAL BODY WEIGHTS (GRAMS)

MALES GROUP 1 0 PPM

	DAY OF STUDY			
ANIMAL#	-7	0	7	13
1026	240	286	325	353
1027	218	265	295	316
1028	230	289	336	372
1029	241	305	345	366
1030	232	291	326	359
1031	230	276	302	308
1032	251	316	357	384
1033	234	284	315	335
1034	239	287	316	347
1035	223	281	315	338
MEAN	234	288	323	348
S.D.	9.5	14.2	18.8	24.1
N	10	10	10	10

APPENDIX D

PROPANE: A 2-WEEK RANGE-FINDING INHALATION TOXICITY
STUDY IN THE RAT VIA WHOLE-BODY EXPOSURES

INDIVIDUAL BODY WEIGHTS (GRAMS)

MALES GROUP 2 120 PPM

	DAY OF STUDY			
ANIMAL#	-7	0	7	13
2026	235	276	291	299
2027	248	300	320	339
2028	241	284	304	316
2029	232	273	284	299
2030	226	275	284	289
2031	230	274	287	295
2032	241	287	315	332
2033	237	285	311	321
2034	220	266	289	306
2035	229	266	288	310
MEAN	234	279	297	310
S.D.	8.2	10.4	13.8	16.1
N	10	10	10	10

APPENDIX D

PROPANE: A 2-WEEK RANGE-FINDING INHALATION TOXICITY
STUDY IN THE RAT VIA WHOLE-BODY EXPOSURES

INDIVIDUAL BODY WEIGHTS (GRAMS)

MALES GROUP 3 1200 PPM

	DAY OF STUDY			
ANIMAL#	-7	0	7	13
3026	222	263	298	321
3027	239	294	318	347
3028	244	295	309	329
3029	226	274	294	308
3030	233	284	319	346
3031	240	282	306	310
3032	243	298	323	347
3033	231	277	298	325
3034	228	279	312	332
3035	233	285	307	315
MEAN	234	283	308	328
S.D.	7.4	10.6	9.8	14.8
N	10	10	10	10

APPENDIX D

PROPANE: A 2-WEEK RANGE-FINDING INHALATION TOXICITY
STUDY IN THE RAT VIA WHOLE-BODY EXPOSURES

INDIVIDUAL BODY WEIGHTS (GRAMS)

MALES GROUP 4 12000 PPM

	DAY OF STUDY			
ANIMAL#	-7	0	7	13
4026	242	298	313	329
4027	228	277	291	308
4028	229	275	288	301
4029	218	267	296	319
4030	239	277	295	308
4031	233	277	308	332
4032	246	296	313	317
4033	234	284	304	322
4034	240	292	326	343
4035	230	275	289	306
MEAN	234	282	302	318
S.D.	8.3	10.4	12.5	13.2
N	10	10	10	10

APPENDIX D

PROPANE: A 2-WEEK RANGE-FINDING INHALATION TOXICITY
STUDY IN THE RAT VIA WHOLE-BODY EXPOSURES

INDIVIDUAL BODY WEIGHTS (GRAMS)

FEMALES GROUP 1 0 PPM

	DAY OF STUDY			
ANIMAL#	-7	0	7	13
1526	178	199	205	230
1527	166	186	209	216
1528	184	197	217	242
1529	174	192	211	233
1530	169	197	212	221
1531	167	176	200	212
1532	177	195	198	213
1533	182	201	223	241
1534	194	221	243	256
1535	172	200	212	238
MEAN	176	196	213	230
S.D.	8.7	11.4	13.0	14.4
N	10	10	10	10

APPENDIX D

PROPANE: A 2-WEEK RANGE-FINDING INHALATION TOXICITY
STUDY IN THE RAT VIA WHOLE-BODY EXPOSURES

INDIVIDUAL BODY WEIGHTS (GRAMS)

FEMALES GROUP 2 120 PPM

	DAY OF STUDY			
ANIMAL#	-7	0	7	13
2526	183	207	231	243
2527	167	186	204	221
2528	189	215	224	239
2529	184	198	204	230
2530	177	206	215	237
2531	176	193	197	204
2532	163	175	190	195
2533	177	192	203	213
2534	169	187	209	243
2535	167	188	198	216
MEAN	175	195	207	224
S.D.	8.4	12.0	12.6	16.9
N	10	10	10	10

APPENDIX D

PROPANE: A 2-WEEK RANGE-FINDING INHALATION TOXICITY
STUDY IN THE RAT VIA WHOLE-BODY EXPOSURES

INDIVIDUAL BODY WEIGHTS (GRAMS)

FEMALES GROUP 3 1200 PPM

	DAY OF STUDY			
ANIMAL#	-7	0	7	13
3526	180	198	220	247
3527	180	190	221	240
3528	183	203	226	247
3529	177	204	211	228
3530	166	175	201	217
3531	162	177	196	212
3532	174	192	209	225
3533	169	183	212	227
3534	167	184	195	212
3535	185	209	212	236
MEAN	174	191	210	229
S.D.	8.0	11.7	10.3	13.2
N	10	10	10	10

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APPENDIX D

PROPANE: A 2-WEEK RANGE-FINDING INHALATION TOXICITY
STUDY IN THE RAT VIA WHOLE-BODY EXPOSURES

INDIVIDUAL BODY WEIGHTS (GRAMS)

FEMALES GROUP 4 12000 PPM

	DAY OF STUDY			
ANIMAL#	-7	0	7	13
4526	168	176	193	205
4527	176	199	221	229
4528	171	182	198	210
4529	163	179	201	220
4530	167	187	203	212
4531	173	205	223	242
4532	180	196	213	216
4533	180	190	200	219
4534	183	204	221	246
4535	190	209	236	257
MEAN	175	193	211	225
S.D.	8.3	11.8	13.8	17.2
N	10	10	10	10

APPENDIX E

PROPANE: A 2-WEEK RANGE-FINDING INHALATION TOXICITY
STUDY IN THE RAT VIA WHOLE-BODY EXPOSURES

INDIVIDUAL BODY WEIGHT CHANGE FROM BASELINE (GRAMS)

MALES GROUP 1 0 PPM

	DAY OF STUDY	
ANIMAL#	0-7	0-13
1026	39	67
1027	30	51
1028	47	82
1029	39	61
1030	35	68
1031	26	32
1032	41	69
1033	31	51
1034	29	60
1035	34	56
MEAN	35	60
S.D.	6.4	13.5
N	10	10

APPENDIX E

PROPANE: A 2-WEEK RANGE-FINDING INHALATION TOXICITY
STUDY IN THE RAT VIA WHOLE-BODY EXPOSURES

INDIVIDUAL BODY WEIGHT CHANGE FROM BASELINE (GRAMS)

MALES GROUP 2 120 PPM

	DAY OF STUDY	
ANIMAL#	0-7	0-13
2026	15	23
2027	20	39
2028	19	32
2029	11	26
2030	9	14
2031	13	21
2032	29	45
2033	26	36
2034	23	40
2035	23	44
MEAN	19	32
S.D.	6.6	10.5
N	10	10

APPENDIX E

PROPANE: A 2-WEEK RANGE-FINDING INHALATION TOXICITY
STUDY IN THE RAT VIA WHOLE-BODY EXPOSURES

INDIVIDUAL BODY WEIGHT CHANGE FROM BASELINE (GRAMS)

MALES GROUP 3 1200 PPM

	DAY OF STUDY	
ANIMAL#	0-7	0-13
3026	34	57
3027	24	53
3028	14	34
3029	20	34
3030	35	62
3031	23	28
3032	25	49
3033	21	48
3034	33	52
3035	22	30
MEAN	25	45
S.D.	6.8	12.1
N	10	10

APPENDIX E

PROPANE: A 2-WEEK RANGE-FINDING INHALATION TOXICITY
STUDY IN THE RAT VIA WHOLE-BODY EXPOSURES

INDIVIDUAL BODY WEIGHT CHANGE FROM BASELINE (GRAMS)

MALES GROUP 4 12000 PPM

	DAY OF STUDY	
ANIMAL#	0-7	0-13
4026	14	31
4027	14	31
4028	13	26
4029	29	52
4030	18	31
4031	31	55
4032	17	21
4033	20	38
4034	33	50
4035	14	32
MEAN	20	37
S.D.	7.8	11.7
N	10	10

APPENDIX E

PROPANE: A 2-WEEK RANGE-FINDING INHALATION TOXICITY
STUDY IN THE RAT VIA WHOLE-BODY EXPOSURES

INDIVIDUAL BODY WEIGHT CHANGE FROM BASELINE (GRAMS)

FEMALES GROUP 1 0 PPM

	DAY OF STUDY	
ANIMAL#	0-7	0-13
1526	5	31
1527	23	31
1528	20	45
1529	20	42
1530	16	24
1531	23	36
1532	3	17
1533	22	40
1534	22	35
1535	12	38
MEAN	17	34
S.D.	7.5	8.3
N	10	10

APPENDIX E

PROPANE: A 2-WEEK RANGE-FINDING INHALATION TOXICITY
STUDY IN THE RAT VIA WHOLE-BODY EXPOSURES

INDIVIDUAL BODY WEIGHT CHANGE FROM BASELINE (GRAMS)

FEMALES GROUP 2 120 PPM

	DAY OF STUDY	
ANIMAL#	0-7	0-13
2526	23	36
2527	18	35
2528	9	25
2529	6	32
2530	9	31
2531	4	11
2532	16	21
2533	11	21
2534	22	55
2535	10	27
MEAN	13	29
S.D.	6.5	11.9
N	10	10

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INDIVIDUAL BODY WEIGHT CHANGE FROM BASELINE (GRAMS)

FEMALES GROUP 3 1200 PPM

ANIMAL#	DAY OF STUDY 0-7	0-13
3526	22	49
3527	31	49
3528	22	44
3529	8	25
3530	26	42
3531	19	35
3532	17	33
3533	29	44
3534	12	28
3535	3	27
MEAN	19	38
S.D.	9.1	9.2
N	10	10

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INDIVIDUAL BODY WEIGHT CHANGE FROM BASELINE (GRAMS)

FEMALES GROUP 4 12000 PPM

	DAY OF STUDY	
ANIMAL#	0-7	0-13
4526	18	29
4527	21	29
4528	16	28
4529	23	42
4530	16	25
4531	18	37
4532	17	19
4533	11	29
4534	17	42
4535	27	47
MEAN	18	33
S.D.	4.4	8.8
N	10	10

APPENDIX F

PROPANE: A 2-WEEK RANGE-FINDING INHALATION TOXICITY
STUDY IN THE RAT VIA WHOLE-BODY EXPOSURES

INDIVIDUAL FEED CONSUMPTION VALUES (GRAMS/KG/DAY)

MALES GROUP 1 0 PPM

	DAY OF STUDY		
ANIMAL#	0	7	13
1026	94	80	71
1027	99	81	73
1028	93	81	71
1029	98	86	70
1030	91	79	69
1031	90	80	64
1032	93	74	65
1033	87	77	67
1034	85	75	69
1035	101	85	73
MEAN	93	80	69
S.D.	5.2	3.8	3.0
N	10	10	10

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STUDY IN THE RAT VIA WHOLE-BODY EXPOSURES

INDIVIDUAL FEED CONSUMPTION VALUES (GRAMS/KG/DAY)

MALES GROUP 2 120 PPM

	DAY OF STUDY		
ANIMAL#	0	7	13
2026	89	79	62
2027	89	75	70
2028	88	74	68
2029	91	78	70
2030	89	77	64
2031	96	84	75
2032	90	79	70
2033	92	77	70
2034	91	83	72
2035	90	81	74
MEAN	91	79	70
S.D.	2.4	3.3	3.9
N	10	10	10

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STUDY IN THE RAT VIA WHOLE-BODY EXPOSURES

INDIVIDUAL FEED CONSUMPTION VALUES (GRAMS/KG/DAY)

MALES GROUP 3 1200 PPM

	DAY OF STUDY		
ANIMAL#	0	7	13
3026	91	81	73
3027	89	76	69
3028	90	78	69
3029	97	85	71
3030	92	74	65
3031	84	76	63
3032	94	81	70
3033	88	85	71
3034	95	84	71
3035	91	80	64
MEAN	91	80	68
S.D.	3.6	3.9	3.5
N	10	10	10

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STUDY IN THE RAT VIA WHOLE-BODY EXPOSURES

INDIVIDUAL FEED CONSUMPTION VALUES (GRAMS/KG/DAY)

MALES GROUP 4 12000 PPM

	DAY OF STUDY		
ANIMAL#	0	7	13
4026	93	86	68
4027	87	75	66
4028	90	77	67
4029	93	74	70
4030	85	79	67
4031	90	82	77
4032	90	78	66
4033	91	74	71
4034	86	78	66
4035	90	77	68
MEAN	89	78	69
S.D.	2.6	3.7	3.2
N	10	10	10

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STUDY IN THE RAT VIA WHOLE-BODY EXPOSURES

INDIVIDUAL FEED CONSUMPTION VALUES (GRAMS/KG/DAY)

FEMALES GROUP 1 0 PPM

	DAY OF STUDY		
ANIMAL#	0	7	13
1526	88	84	83
1527	94	89	81
1528	92	89	86
1529	93	85	84
1530	92	SF	80
1531	90	87	80
1532	86	78	79
1533	85	84	79
1534	101	95	86
1535	92	89	88
MEAN	91	87	83
S.D.	4.6	4.7	3.3
N	10	9	10

SF=Spilled Feeder

APPENDIX F

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STUDY IN THE RAT VIA WHOLE-BODY EXPOSURES

INDIVIDUAL FEED CONSUMPTION VALUES (GRAMS/KG/DAY)

FEMALES GROUP 2 120 PPM

	DAY OF STUDY		
ANIMAL#	0	7	13
2526	101	SF	87
2527	CF	87	83
2528	90	81	84
2529	81	82	86
2530	90	85	85
2531	91	83	81
2532	95	93	88
2533	CF	80	78
2534	88	87	98
2535	96	92	93
MEAN	92	86	86
S.D.	5.9	4.6	5.8
N	8	9	10

SF=Spilled Feeder CF=Contaminated Feeder

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STUDY IN THE RAT VIA WHOLE-BODY EXPOSURES

INDIVIDUAL FEED CONSUMPTION VALUES (GRAMS/KG/DAY)

FEMALES GROUP 3 1200 PPM

	DAY OF STUDY		
ANIMAL#	0	7	13
3526	91	89	85
3527	86	90	79
3528	94	85	84
3529	90	81	80
3530	85	93	83
3531	94	88	87
3532	92	86	83
3533	99	94	87
3534	91	87	84
3535	95	87	86
MEAN	92	88	84
S.D.	4.0	3.7	2.8
N	10	10	10

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STUDY IN THE RAT VIA WHOLE-BODY EXPOSURES

INDIVIDUAL FEED CONSUMPTION VALUES (GRAMS/KG/DAY)

FEMALES GROUP 4 12000 PPM

	DAY OF STUDY		
ANIMAL#	0	7	13
4526	92	91	85
4527	89	88	76
4528	87	87	83
4529	SF	92	89
4530	88	83	80
4531	96	89	86
4532	95	88	89
4533	89	94	91
4534	91	93	85
4535	89	90	85
MEAN	91	89	85
S.D.	3.0	3.2	4.4
N	9	10	10

SF=Spilled Feeder

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Key to Abbreviations:

g = Grams
wt. = Weight
observ. = Observed

Corresponding exposure levels for each group were as follows:

Group 1 - 0 ppm
Group 2 - 120 ppm
Group 3 - 1200 ppm
Group 4 - 12000 ppm

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Animal No/sex	Group/ Subgroup	Terminal Body wt. (g)	Adrenal Glands	Brain	Epididymides	Heart	Kidneys	Liver
				Male Animals				
1026/M	1/1	324.9	0.0607	1.9484	0.9369	1.2314	2.7113	10.6718
1027/M	1/1	289.6	0.0671	1.8968	1.0019	1.0613	2.7013	9.1222
1028/M	1/1	333.8	0.0643	2.0543	1.0700	1.3376	3.1270	12.8615
1029/M	1/1	337.0	0.0808	2.3120	0.9827	1.3612	3.1784	11.1292
1030/M	1/1	324.9	0.0640	2.1352	0.8171	1.3315	3.2575	11.6918
1031/M	1/1	284.3	0.0627	1.9405	0.8476	1.0506	2.6687	8.6745
1032/M	1/1	356.2	0.0640	2.0363	0.9144	1.2592	3.3886	11.4288
1033/M	1/1	308.5	0.0580	1.9134	0.9591	1.0693	2.8370	10.1162
1034/M	1/1	331.3	0.0444	1.8913	0.8327	1.1724	2.8172	10.4158
1035/M	1/1	306.7	0.0439	2.0646	0.9585	1.2628	2.8088	11.2694
Mean:		319.7	0.0610	2.0193	0.9321	1.2137	2.9496	10.7381
Standard deviation:		22.3	0.0107	0.1319	0.0806	0.1193	0.2622	1.2336
Number of observ. :		(10)	(10)	(10)	(10)	(10)	(10)	(10)
2026/M	2/1	275.9	0.0607	2.0451	0.9091	1.1341	2.9484	9.4348
2027/M	2/1	308.1	0.0627	2.2051	1.1227	1.2692	3.6154	12.6010
2028/M	2/1	286.6	0.0702	2.2328	1.1096	1.2643	3.3184	10.6056
2029/M	2/1	272.0	0.0416	2.1216	0.9104	0.9967	2.5957	8.4192
2030/M	2/1	267.9	0.0444	2.0860	0.9908	1.0143	2.8304	8.9410
2031/M	2/1	275.5	0.0519	1.9165	0.6769	1.0387	2.7838	9.8025
2032/M	2/1	305.3	0.0589	1.9990	0.9084	1.2642	2.7818	9.9761
2033/M	2/1	304.1	0.0619	1.9478	0.8550	0.9831	2.4936	8.8994
2034/M	2/1	281.8	0.0624	2.0405	0.9034	1.0643	2.9289	10.8889
2035/M	2/1	282.8	0.0674	1.9832	0.8818	1.1088	2.7126	11.3809
Mean:		286.0	0.0582	2.0578	0.9268	1.1138	2.9009	10.0949
Standard deviation:		14.7	0.0094	0.1047	0.1278	0.1148	0.3359	1.2880
Number of observ. :		(10)	(10)	(10)	(10)	(10)	(10)	(10)
3026/M	3/1	290.4	0.0716	2.1049	0.8593	1.2516	3.2448	9.4578
3027/M	3/1	310.9	0.0763	2.0890	0.9426	1.1660	2.7799	10.4752
3028/M	3/1	304.8	0.0569	1.9800	0.8837	1.1604	2.9924	11.6184
3029/M	3/1	282.6	0.0548	1.9647	0.8796	1.0254	2.6974	8.7939
3030/M	3/1	319.6	0.0675	1.7847	0.8336	1.0417	2.6646	8.8223
3031/M	3/1	288.3	0.0534	2.0071	0.9516	1.0614	2.3722	9.1429
3032/M	3/1	318.8	0.0479	1.9732	0.9215	1.2337	2.6980	10.0471
3033/M	3/1	296.3	0.0550	2.1450	0.8815	1.2511	3.1689	10.5123
3034/M	3/1	307.3	0.0582	2.1257	1.0798	1.0933	2.7745	10.7190
3035/M	3/1	298.7	0.0563	2.0048	0.7966	1.2108	2.9714	10.2898
Mean:		301.8	0.0598	2.0179	0.9030	1.1495	2.8364	9.9879
Standard deviation:		12.7	0.0090	0.1061	0.0781	0.0881	0.2604	0.9177
Number of observ. :		(10)	(10)	(10)	(10)	(10)	(10)	(10)
4026/M	4/1	301.0	0.0605	1.9114	0.8043	1.1414	2.8568	10.6230
4027/M	4/1	288.3	0.0590	2.0029	0.8142	1.1196	2.9716	9.9515
4028/M	4/1	276.5	0.0502	1.9668	0.9154	1.1093	2.9040	8.7909

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Animal No/sex	Group/ Subgroup	Terminal Body wt. (g)	Adrenal Glands	Brain	Epididymides	Heart	Kidneys	Liver
4029/M	4/1	297.6	0.0635	2.0359	0.9325	1.1658	2.7633	10.7183
4030/M	4/1	282.2	0.0645	2.0963	0.8731	1.1112	3.0963	10.2790
4031/M	4/1	311.2	0.0531	2.1517	0.8144	1.2611	3.1881	11.9687
4032/M	4/1	302.2	0.0426	2.2206	0.9270	1.1194	2.9364	10.3248
4033/M	4/1	295.8	0.0688	1.7689	0.8985	1.1395	2.8258	9.4859
4034/M	4/1	317.8	0.0508	2.1611	1.0369	1.3783	2.9910	10.6226
4035/M	4/1	285.0	0.0486	2.1703	0.9531	1.0788	2.8997	9.3526
M e a n:		295.8	0.0562	2.0486	0.8969	1.1624	2.9433	10.2117
Standard deviation:		13.0	0.0083	0.1398	0.0731	0.0903	0.1263	0.8851
Number of observ. :		(10)	(10)	(10)	(10)	(10)	(10)	(10)

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Animal No/sex	Group/ Subgroup	Terminal Body wt. (g)	Lungs	Pituitary gland Seminal vesicles		Spleen	Testes	Thymus
				Male Animals				
1026/M	1/1	324.9	1.5893	0.0075	1.3790	0.6480	2.7094	0.6381
1027/M	1/1	289.6	1.7235	0.0104	1.0340	0.5780	3.5835	0.4979
1028/M	1/1	333.8	1.8421	0.0116	0.9516	0.6564	2.9125	0.6200
1029/M	1/1	337.0	2.0925	0.0130	1.1706	0.6810	3.4410	0.5419
1030/M	1/1	324.9	1.7766	0.0106	1.6790	0.6611	3.1913	0.5605
1031/M	1/1	284.3	1.4004	0.0090	1.4801	0.6054	2.9829	0.6078
1032/M	1/1	356.2	1.9519	0.0126	1.2637	0.6902	3.1956	0.5520
1033/M	1/1	308.5	1.5661	0.0101	1.4401	0.6093	2.9011	0.4915
1034/M	1/1	331.3	1.7211	0.0079	1.0719	0.6109	2.8976	0.5806
1035/M	1/1	306.7	1.8933	0.0079	1.4418	0.7464	3.0139	0.5663
Mean:		319.7	1.7557	0.0101	1.2912	0.6487	3.0829	0.5657
Standard deviation:		22.3	0.2030	0.0020	0.2318	0.0499	0.2696	0.0484
Number of observ. :		(10)	(10)	(10)	(10)	(10)	(10)	(10)
2026/M	2/1	275.9	1.9428	0.0107	1.2119	0.6572	2.9155	0.4446
2027/M	2/1	308.1	2.0523	0.0134	2.4512	0.6337	3.3169	0.4577
2028/M	2/1	286.6	1.9556	0.0109	1.9187	0.6025	3.2426	0.5787
2029/M	2/1	272.0	1.6381	0.0095	0.9823	0.6483	2.8425	0.4104
2030/M	2/1	267.9	1.5509	0.0082	0.9723	0.5853	3.1194	0.3693
2031/M	2/1	275.5	1.4319	0.0089	0.7710	0.5192	2.1217	0.4295
2032/M	2/1	305.3	1.6626	0.0085	1.0611	0.5502	3.0620	0.4821
2033/M	2/1	304.1	1.4088	0.0082	1.4060	0.5514	2.8193	0.4855
2034/M	2/1	281.8	1.3450	0.0069	1.4921	0.4889	2.8918	0.3494
2035/M	2/1	282.8	1.4428	0.0091	1.4323	0.5942	2.9860	0.5084
Mean:		286.0	1.6431	0.0094	1.3699	0.5831	2.9318	0.4516
Standard deviation:		14.7	0.2565	0.0018	0.5031	0.0556	0.3298	0.0675
Number of observ. :		(10)	(10)	(10)	(10)	(10)	(10)	(10)
3026/M	3/1	290.4	1.9671	0.0122	1.6290	0.8705	2.9479	0.4545
3027/M	3/1	310.9	1.4752	0.0083	0.7922	0.5846	2.9723	0.5396
3028/M	3/1	304.8	1.6481	0.0077	1.0691	0.6350	2.8961	0.5088
3029/M	3/1	282.6	1.7029	0.0094	1.1986	0.4992	3.1555	0.4923
3030/M	3/1	319.6	1.3770	0.0105	1.2654	0.5300	3.1685	0.5417
3031/M	3/1	288.3	1.8051	0.0080	1.1430	0.7363	3.0776	0.6134
3032/M	3/1	318.8	1.8047	0.0089	0.8157	0.5995	3.4118	0.5573
3033/M	3/1	296.3	2.4421	0.0091	1.3929	0.5917	3.3537	0.5475
3034/M	3/1	307.3	2.1033	0.0087	1.1788	0.6745	3.4019	0.4607
3035/M	3/1	298.7	1.4379	0.0082	1.3484	0.5572	2.7853	0.3583
Mean:		301.8	1.7763	0.0091	1.1833	0.6279	3.1171	0.5074
Standard deviation:		12.7	0.3291	0.0014	0.2538	0.1095	0.2206	0.0707
Number of observ. :		(10)	(10)	(10)	(10)	(10)	(10)	(10)
4026/M	4/1	301.0	1.9335	0.0068	1.3827	0.6739	2.6213	0.4985
4027/M	4/1	288.3	1.7473	0.0084	1.3638	0.6541	2.6200	0.5750
4028/M	4/1	276.5	1.7818	0.0089	1.3493	0.4940	2.9447	0.4291

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Animal No/sex	Group/ Subgroup	Terminal Body wt. (g)	Lungs	Pituitary gland	Seminal vesicles	Spleen	Testes	Thymus
4029/M	4/1	297.6	1.8641	0.0023	1.4377	0.6671	2.8559	0.4910
4030/M	4/1	282.2	2.2086	0.0086	1.3872	0.5329	3.1484	0.3365
4031/M	4/1	311.2	2.7342	0.0075	1.1765	0.7221	2.9249	0.5014
4032/M	4/1	302.2	1.7962	0.0074	1.4748	0.7086	3.2235	0.3732
4033/M	4/1	295.8	1.3964	0.0078	1.0506	0.4963	2.9969	0.4232
4034/M	4/1	317.8	2.1540	0.0110	0.9945	0.6008	3.2313	0.5680
4035/M	4/1	285.0	1.7025	0.0103	1.3493	0.6076	3.6426	0.4644
M e a n:		295.8	1.9319	0.0079	1.2966	0.6157	3.0210	0.4660
Standard deviation:		13.0	0.3634	0.0024	0.1645	0.0841	0.3076	0.0773
Number of observ. :		(10)	(10)	(10)	(10)	(10)	(10)	(10)

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Animal No/sex	Group/ Subgroup	Terminal Body wt. (g)	Adrenal Glands	Brain	Heart	Kidneys	Liver	Lungs
				Female Animals				
1526/F	1/1	210.6	0.0663	1.9265	0.6803	1.8062	6.0786	1.0813
1527/F	1/1	202.4	0.0830	2.0398	0.8540	1.8888	8.5436	1.2315
1528/F	1/1	221.0	0.0826	1.9194	0.8506	1.9800	6.9672	1.5055
1529/F	1/1	218.2	0.0647	1.8995	0.9063	2.3377	7.9420	1.6367
1530/F	1/1	211.2	0.0716	2.1319	0.9193	2.0932	8.0581	1.4413
1531/F	1/1	198.9	0.0694	1.9345	0.7201	2.2029	7.2441	1.2553
1532/F	1/1	198.4	0.0660	2.0285	0.7813	2.0768	7.5946	1.8598
1533/F	1/1	220.6	0.0666	1.9780	0.9072	2.2524	9.4394	1.6284
1534/F	1/1	235.6	0.0741	2.0378	0.9479	2.2433	8.3618	1.5753
1535/F	1/1	214.1	0.0861	1.9341	0.7782	1.9363	7.8927	1.5034
Mean:		213.1	0.0730	1.9830	0.8345	2.0818	7.8122	1.4719
Standard deviation:		11.5	0.0081	0.0741	0.0907	0.1765	0.9224	0.2293
Number of observ. :		(10)	(10)	(10)	(10)	(10)	(10)	(10)
2526/F	2/1	226.3	0.0576	2.0393	0.8338	2.0472	9.0004	1.5632
2527/F	2/1	200.0	0.0731	1.9712	0.8171	2.1071	8.1285	1.0657
2528/F	2/1	227.3	0.0877	2.1160	0.8959	2.2799	7.6029	1.6721
2529/F	2/1	208.5	0.0748	2.1504	0.8923	2.1243	8.4175	1.6328
2530/F	2/1	215.1	0.0883	1.8996	0.8035	2.0737	7.9011	1.3203
2531/F	2/1	185.0	0.0628	2.0618	0.8191	1.8958	5.9195	1.3641
2532/F	2/1	177.8	0.0567	1.8508	0.7638	1.7501	5.6015	1.3713
2533/F	2/1	200.4	0.0804	1.8798	0.8538	2.2660	7.4601	1.4148
2534/F	2/1	220.4	0.0601	1.8883	0.8331	1.9288	8.9780	1.3640
2535/F	2/1	198.6	0.0620	1.9127	0.7870	2.0036	9.2331	1.1974
Mean:		205.9	0.0704	1.9770	0.8299	2.0477	7.8243	1.3966
Standard deviation:		16.7	0.0122	0.1074	0.0422	0.1631	1.2428	0.1878
Number of observ. :		(10)	(10)	(10)	(10)	(10)	(10)	(10)
3526/F	3/1	222.5	0.0729	1.8948	0.8247	2.0208	7.6147	1.4330
3527/F	3/1	219.4	0.0966	2.0254	0.9296	2.2389	7.9041	1.7264
3528/F	3/1	225.2	0.0761	2.1257	0.9125	2.3853	9.1138	1.8960
3529/F	3/1	215.1	0.0608	2.1166	0.8475	2.1279	9.0552	1.2755
3530/F	3/1	197.7	0.0779	1.9035	0.7913	1.7944	6.8993	1.4437
3531/F	3/1	201.2	0.0771	1.9211	0.7017	2.1119	7.2176	1.4113
3532/F	3/1	204.6	0.0577	2.0665	0.8381	1.8201	7.3850	1.5329
3533/F	3/1	206.4	0.0782	2.0579	0.8566	1.9826	7.8226	1.4295
3534/F	3/1	195.4	0.0722	1.8664	0.7605	2.0793	7.3792	1.2440
3535/F	3/1	215.2	0.0765	1.9183	0.7931	2.0352	9.1437	1.1827
Mean:		210.3	0.0746	1.9896	0.8256	2.0596	7.9535	1.4575
Standard deviation:		10.6	0.0106	0.0988	0.0681	0.1769	0.8444	0.2181
Number of observ. :		(10)	(10)	(10)	(10)	(10)	(10)	(10)
4526/F	4/1	187.5	0.0708	1.8723	0.6850	1.9450	6.1489	1.2856
4527/F	4/1	207.2	0.0873	1.9424	0.8694	2.1852	7.1785	1.5069
4528/F	4/1	192.4	0.0658	1.7491	0.7906	2.1227	7.2303	1.4969

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Animal No/sex	Group/ Subgroup	Terminal Body wt. (g)	Adrenal Glands	Brain	Heart	Kidneys	Liver	Lungs
4529/F	4/1	201.9	0.0690	2.0267	0.7856	2.1071	7.4269	1.2429
4530/F	4/1	190.3	0.0559	1.9853	0.7675	1.8558	7.9664	1.4567
4531/F	4/1	220.6	0.0730	1.9580	0.8446	1.9635	8.0949	1.1523
4532/F	4/1	203.7	0.0745	1.8763	0.8113	1.9605	6.7986	1.2259
4533/F	4/1	200.7	0.0752	1.9609	0.9179	2.0005	7.9297	1.1911
4534/F	4/1	222.1	0.0724	1.8353	0.8954	2.0301	8.6086	1.4788
4535/F	4/1	231.4	0.0890	2.0816	0.9829	2.4994	9.6234	1.7301
M e a n:		205.8	0.0733	1.9288	0.8350	2.0670	7.7006	1.3767
Standard deviation:		14.7	0.0096	0.0973	0.0854	0.1804	0.9770	0.1847
Number of observ. :		(10)	(10)	(10)	(10)	(10)	(10)	(10)

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Animal No/sex	Group/ Subgroup	Terminal Body wt. (g)	Pituitary gland Ovaries	Thymus	Spleen		Uterus
				Female Animals			
1526/F	1/1	210.6	0.1001	0.0145	0.5374	0.4354	0.8164
1527/F	1/1	202.4	0.0922	0.0127	0.4161	0.4268	0.5770
1528/F	1/1	221.0	0.1112	0.0144	0.5623	0.5107	0.7817
1529/F	1/1	218.2	0.0761	0.0115	0.5736	0.5577	0.5511
1530/F	1/1	211.2	0.1057	0.0141	0.6415	0.5016	0.5483
1531/F	1/1	198.9	0.0923	0.0111	0.5386	0.3157	0.5141
1532/F	1/1	198.4	0.1012	0.0118	0.6322	0.4721	0.8453
1533/F	1/1	220.6	0.1339	0.0057	0.5362	0.4861	0.7490
1534/F	1/1	235.6	0.1091	0.0125	0.4981	0.4606	0.4796
1535/F	1/1	214.1	0.1251	0.0149	0.5368	0.5849	0.6533
Mean:		213.1	0.1047	0.0123	0.5473	0.4752	0.6516
Standard deviation:		11.5	0.0166	0.0027	0.0642	0.0749	0.1358
Number of observ. :		(10)	(10)	(10)	(10)	(10)	(10)
2526/F	2/1	226.3	0.0887	0.0090	0.5611	0.4238	0.4693
2527/F	2/1	200.0	0.0914	0.0123	0.5584	0.4592	0.5403
2528/F	2/1	227.3	0.1160	0.0173	0.6673	0.4705	0.5667
2529/F	2/1	208.5	0.1050	0.0092	0.4466	0.6425	1.0142
2530/F	2/1	215.1	0.1269	0.0122	0.4434	0.5839	0.7832
2531/F	2/1	185.0	0.0930	0.0106	0.4566	0.5419	1.1415
2532/F	2/1	177.8	0.0759	0.0060	0.4595	0.4355	0.4042
2533/F	2/1	200.4	0.0885	0.0094	0.6367	0.4759	0.7536
2534/F	2/1	220.4	0.0941	0.0108	0.5461	0.6748	0.3966
2535/F	2/1	198.6	0.1100	0.0133	0.4935	0.4232	0.5958
Mean:		205.9	0.0990	0.0110	0.5269	0.5131	0.6665
Standard deviation:		16.7	0.0152	0.0030	0.0805	0.0924	0.2537
Number of observ. :		(10)	(10)	(10)	(10)	(10)	(10)
3526/F	3/1	222.5	0.0963	0.0105	0.5438	0.5476	0.4919
3527/F	3/1	219.4	0.1369	0.0119	0.4547	0.7576	0.5576
3528/F	3/1	225.2	0.1115	0.0134	0.6098	0.6358	0.7799
3529/F	3/1	215.1	0.0848	0.0092	0.4872	0.6286	0.5840
3530/F	3/1	197.7	0.0831	0.0094	0.3900	0.4757	0.4996
3531/F	3/1	201.2	0.1299	0.0058	0.5374	0.5097	0.5184
3532/F	3/1	204.6	0.1200	0.0066	0.5230	0.4052	0.6368
3533/F	3/1	206.4	0.1076	0.0157	0.5400	0.4032	0.5850
3534/F	3/1	195.4	0.0707	0.0120	0.3645	0.3109	0.5487
3535/F	3/1	215.2	0.0976	0.0111	0.4731	0.3885	0.5838
Mean:		210.3	0.1038	0.0106	0.4924	0.5063	0.5786
Standard deviation:		10.6	0.0213	0.0030	0.0748	0.1376	0.0835
Number of observ. :		(10)	(10)	(10)	(10)	(10)	(10)
4526/F	4/1	187.5	0.0677	0.0139	0.3332	0.3653	0.6112
4527/F	4/1	207.2	0.0788	0.0140	0.4737	0.5259	0.5567
4528/F	4/1	192.4	0.1024	0.0131	0.4982	0.4149	0.5326

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Animal No/sex	Group/ Subgroup	Terminal Body wt. (g)	Ovaries	Pituitary gland	Spleen	Thymus	Uterus
4529/F	4/1	201.9	0.1040	0.0098	0.5063	0.4158	0.5434
4530/F	4/1	190.3	0.0752	0.0125	0.4200	0.4689	0.4894
4531/F	4/1	220.6	0.0756	0.0122	0.4477	0.4658	0.5936
4532/F	4/1	203.7	0.0959	0.0137	0.5733	0.4414	0.4476
4533/F	4/1	200.7	0.0857	0.0119	0.4579	0.4465	0.5455
4534/F	4/1	222.1	0.1088	0.0128	0.5124	0.4339	0.6081
4535/F	4/1	231.4	0.1603	0.0138	0.6037	0.7307	0.9801
M e a n:		205.8	0.0954	0.0128	0.4826	0.4709	0.5908
Standard deviation:		14.7	0.0268	0.0013	0.0765	0.1004	0.1460
Number of observ. :		(10)	(10)	(10)	(10)	(10)	(10)

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Animal No/sex	Group/ Subgroup	Terminal Body wt. (g)	Adrenal Glands	Brain	Epididymides	Heart	Kidneys	Liver
				Male Animals				
1026/M	1/1	324.9	0.0187	0.5997	0.2884	0.3790	0.8345	3.2846
1027/M	1/1	289.6	0.0232	0.6550	0.3460	0.3665	0.9328	3.1499
1028/M	1/1	333.8	0.0193	0.6154	0.3206	0.4007	0.9368	3.8531
1029/M	1/1	337.0	0.0240	0.6861	0.2916	0.4039	0.9431	3.3024
1030/M	1/1	324.9	0.0197	0.6572	0.2515	0.4098	1.0026	3.5986
1031/M	1/1	284.3	0.0221	0.6826	0.2981	0.3695	0.9387	3.0512
1032/M	1/1	356.2	0.0180	0.5717	0.2567	0.3535	0.9513	3.2085
1033/M	1/1	308.5	0.0188	0.6202	0.3109	0.3466	0.9196	3.2792
1034/M	1/1	331.3	0.0134	0.5709	0.2513	0.3539	0.8503	3.1439
1035/M	1/1	306.7	0.0143	0.6732	0.3125	0.4117	0.9158	3.6744
Mean:		319.7	0.0191	0.6332	0.2928	0.3795	0.9226	3.3546
Standard deviation:		22.3	0.0034	0.0437	0.0318	0.0251	0.0486	0.2632
Number of observ. :		(10)	(10)	(10)	(10)	(10)	(10)	(10)
2026/M	2/1	275.9	0.0220	0.7412	0.3295	0.4111	1.0686	3.4196
2027/M	2/1	308.1	0.0204	0.7157	0.3644	0.4119	1.1735	4.0899
2028/M	2/1	286.6	0.0245	0.7791	0.3872	0.4411	1.1579	3.7005
2029/M	2/1	272.0	0.0153	0.7800	0.3347	0.3664	0.9543	3.0953
2030/M	2/1	267.9	0.0166	0.7786	0.3698	0.3786	1.0565	3.3374
2031/M	2/1	275.5	0.0188	0.6956	0.2457	0.3770	1.0105	3.5581
2032/M	2/1	305.3	0.0193	0.6548	0.2975	0.4141	0.9112	3.2676
2033/M	2/1	304.1	0.0204	0.6405	0.2812	0.3233	0.8200	2.9265
2034/M	2/1	281.8	0.0221	0.7241	0.3206	0.3777	1.0394	3.8641
2035/M	2/1	282.8	0.0238	0.7013	0.3118	0.3921	0.9592	4.0244
Mean:		286.0	0.0203	0.7211	0.3242	0.3893	1.0151	3.5283
Standard deviation:		14.7	0.0030	0.0500	0.0431	0.0326	0.1087	0.3902
Number of observ. :		(10)	(10)	(10)	(10)	(10)	(10)	(10)
3026/M	3/1	290.4	0.0247	0.7248	0.2959	0.4310	1.1174	3.2568
3027/M	3/1	310.9	0.0245	0.6719	0.3032	0.3750	0.8941	3.3693
3028/M	3/1	304.8	0.0187	0.6496	0.2899	0.3807	0.9818	3.8118
3029/M	3/1	282.6	0.0194	0.6952	0.3113	0.3628	0.9545	3.1118
3030/M	3/1	319.6	0.0211	0.5584	0.2608	0.3259	0.8337	2.7604
3031/M	3/1	288.3	0.0185	0.6962	0.3301	0.3682	0.8228	3.1713
3032/M	3/1	318.8	0.0150	0.6189	0.2891	0.3870	0.8463	3.1515
3033/M	3/1	296.3	0.0186	0.7239	0.2975	0.4222	1.0695	3.5479
3034/M	3/1	307.3	0.0189	0.6917	0.3514	0.3558	0.9029	3.4881
3035/M	3/1	298.7	0.0188	0.6712	0.2667	0.4054	0.9948	3.4449
Mean:		301.8	0.0198	0.6702	0.2996	0.3814	0.9418	3.3114
Standard deviation:		12.7	0.0029	0.0508	0.0270	0.0317	0.1002	0.2887
Number of observ. :		(10)	(10)	(10)	(10)	(10)	(10)	(10)
4026/M	4/1	301.0	0.0201	0.6350	0.2672	0.3792	0.9491	3.5292
4027/M	4/1	288.3	0.0205	0.6947	0.2824	0.3883	1.0307	3.4518
4028/M	4/1	276.5	0.0182	0.7113	0.3311	0.4012	1.0503	3.1793

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4029/M	4/1	297.6	0.0213	0.6841	0.3133	0.3917	0.9285	3.6016
4030/M	4/1	282.2	0.0229	0.7428	0.3094	0.3938	1.0972	3.6425
4031/M	4/1	311.2	0.0171	0.6914	0.2617	0.4052	1.0245	3.8460
4032/M	4/1	302.2	0.0141	0.7348	0.3068	0.3704	0.9717	3.4165
4033/M	4/1	295.8	0.0233	0.5980	0.3038	0.3852	0.9553	3.2069
4034/M	4/1	317.8	0.0160	0.6800	0.3263	0.4337	0.9412	3.3425
4035/M	4/1	285.0	0.0171	0.7615	0.3344	0.3785	1.0174	3.2816
	M e a n:	295.8	0.0190	0.6934	0.3036	0.3927	0.9966	3.4498
Standard deviation:		13.0	0.0030	0.0493	0.0256	0.0178	0.0554	0.2099
Number of observ. :		(10)	(10)	(10)	(10)	(10)	(10)	(10)

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Animal No/sex	Group/ Subgroup	Terminal Body wt. (g)	Lungs	Pituitary gland Seminal vesicles		Spleen	Testes	Thymus
				Male Animals				
1026/M	1/1	324.9	0.4892	0.0023	0.4244	0.1994	0.8339	0.1964
1027/M	1/1	289.6	0.5951	0.0036	0.3570	0.1996	1.2374	0.1719
1028/M	1/1	333.8	0.5519	0.0035	0.2851	0.1966	0.8725	0.1857
1029/M	1/1	337.0	0.6209	0.0039	0.3474	0.2021	1.0211	0.1608
1030/M	1/1	324.9	0.5468	0.0033	0.5168	0.2035	0.9822	0.1725
1031/M	1/1	284.3	0.4926	0.0032	0.5206	0.2129	1.0492	0.2138
1032/M	1/1	356.2	0.5480	0.0035	0.3548	0.1938	0.8971	0.1550
1033/M	1/1	308.5	0.5076	0.0033	0.4668	0.1975	0.9404	0.1593
1034/M	1/1	331.3	0.5195	0.0024	0.3235	0.1844	0.8746	0.1752
1035/M	1/1	306.7	0.6173	0.0026	0.4701	0.2434	0.9827	0.1846
Mean:		319.7	0.5489	0.0031	0.4067	0.2033	0.9691	0.1775
Standard deviation:		22.3	0.0487	0.0005	0.0840	0.0158	0.1174	0.0182
Number of observ. :		(10)	(10)	(10)	(10)	(10)	(10)	(10)
2026/M	2/1	275.9	0.7042	0.0039	0.4393	0.2382	1.0567	0.1611
2027/M	2/1	308.1	0.6661	0.0043	0.7956	0.2057	1.0766	0.1486
2028/M	2/1	286.6	0.6823	0.0038	0.6695	0.2102	1.1314	0.2019
2029/M	2/1	272.0	0.6022	0.0035	0.3611	0.2383	1.0450	0.1509
2030/M	2/1	267.9	0.5789	0.0031	0.3629	0.2185	1.1644	0.1378
2031/M	2/1	275.5	0.5197	0.0032	0.2799	0.1885	0.7701	0.1559
2032/M	2/1	305.3	0.5446	0.0028	0.3476	0.1802	1.0029	0.1579
2033/M	2/1	304.1	0.4633	0.0027	0.4623	0.1813	0.9271	0.1597
2034/M	2/1	281.8	0.4773	0.0024	0.5295	0.1735	1.0262	0.1240
2035/M	2/1	282.8	0.5102	0.0032	0.5065	0.2101	1.0559	0.1798
Mean:		286.0	0.5749	0.0033	0.4754	0.2045	1.0256	0.1578
Standard deviation:		14.7	0.0866	0.0006	0.1584	0.0233	0.1110	0.0214
Number of observ. :		(10)	(10)	(10)	(10)	(10)	(10)	(10)
3026/M	3/1	290.4	0.6774	0.0042	0.5610	0.2998	1.0151	0.1565
3027/M	3/1	310.9	0.4745	0.0027	0.2548	0.1880	0.9560	0.1736
3028/M	3/1	304.8	0.5407	0.0025	0.3508	0.2083	0.9502	0.1669
3029/M	3/1	282.6	0.6026	0.0033	0.4241	0.1766	1.1166	0.1742
3030/M	3/1	319.6	0.4309	0.0033	0.3959	0.1658	0.9914	0.1695
3031/M	3/1	288.3	0.6261	0.0028	0.3965	0.2554	1.0675	0.2128
3032/M	3/1	318.8	0.5661	0.0028	0.2559	0.1880	1.0702	0.1748
3033/M	3/1	296.3	0.8242	0.0031	0.4701	0.1997	1.1319	0.1848
3034/M	3/1	307.3	0.6844	0.0028	0.3836	0.2195	1.1070	0.1499
3035/M	3/1	298.7	0.4814	0.0027	0.4514	0.1865	0.9325	0.1200
Mean:		301.8	0.5908	0.0030	0.3944	0.2088	1.0338	0.1683
Standard deviation:		12.7	0.1185	0.0005	0.0933	0.0407	0.0743	0.0240
Number of observ. :		(10)	(10)	(10)	(10)	(10)	(10)	(10)
4026/M	4/1	301.0	0.6424	0.0023	0.4594	0.2239	0.8709	0.1656
4027/M	4/1	288.3	0.6061	0.0029	0.4730	0.2269	0.9088	0.1994
4028/M	4/1	276.5	0.6444	0.0032	0.4880	0.1787	1.0650	0.1552

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Animal No/sex	Group/ Subgroup	Terminal Body wt. (g)	Lungs	Pituitary gland Seminal vesicles		Spleen	Testes	Thymus
4029/M	4/1	297.6	0.6264	0.0008	0.4831	0.2242	0.9596	0.1650
4030/M	4/1	282.2	0.7826	0.0030	0.4916	0.1888	1.1157	0.1192
4031/M	4/1	311.2	0.8786	0.0024	0.3781	0.2320	0.9399	0.1611
4032/M	4/1	302.2	0.5944	0.0024	0.4880	0.2345	1.0667	0.1235
4033/M	4/1	295.8	0.4721	0.0026	0.3552	0.1678	1.0132	0.1431
4034/M	4/1	317.8	0.6778	0.0035	0.3129	0.1890	1.0168	0.1787
4035/M	4/1	285.0	0.5974	0.0036	0.4734	0.2132	1.2781	0.1629
M e a n:		295.8	0.6522	0.0027	0.4403	0.2079	1.0235	0.1574
Standard deviation:		13.0	0.1109	0.0008	0.0657	0.0245	0.1177	0.0241
Number of observ. :		(10)	(10)	(10)	(10)	(10)	(10)	(10)

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Animal No/sex	Group/ Subgroup	Terminal Body wt. (g)	Adrenal Glands	Brain	Heart	Kidneys	Liver	Lungs
				Female Animals				
1526/F	1/1	210.6	0.0315	0.9148	0.3230	0.8576	2.8863	0.5134
1527/F	1/1	202.4	0.0410	1.0078	0.4219	0.9332	4.2211	0.6084
1528/F	1/1	221.0	0.0374	0.8685	0.3849	0.8959	3.1526	0.6812
1529/F	1/1	218.2	0.0297	0.8705	0.4154	1.0714	3.6398	0.7501
1530/F	1/1	211.2	0.0339	1.0094	0.4353	0.9911	3.8154	0.6824
1531/F	1/1	198.9	0.0349	0.9726	0.3620	1.1075	3.6421	0.6311
1532/F	1/1	198.4	0.0333	1.0224	0.3938	1.0468	3.8279	0.9374
1533/F	1/1	220.6	0.0302	0.8966	0.4112	1.0210	4.2790	0.7382
1534/F	1/1	235.6	0.0315	0.8649	0.4023	0.9522	3.5492	0.6686
1535/F	1/1	214.1	0.0402	0.9034	0.3635	0.9044	3.6865	0.7022
Mean:		213.1	0.0343	0.9331	0.3913	0.9781	3.6700	0.6913
Standard deviation:		11.5	0.0040	0.0634	0.0338	0.0827	0.4241	0.1101
Number of observ. :		(10)	(10)	(10)	(10)	(10)	(10)	(10)
2526/F	2/1	226.3	0.0255	0.9011	0.3684	0.9046	3.9772	0.6908
2527/F	2/1	200.0	0.0366	0.9856	0.4086	1.0536	4.0643	0.5329
2528/F	2/1	227.3	0.0386	0.9309	0.3941	1.0030	3.3449	0.7356
2529/F	2/1	208.5	0.0359	1.0314	0.4280	1.0188	4.0372	0.7831
2530/F	2/1	215.1	0.0411	0.8831	0.3735	0.9641	3.6732	0.6138
2531/F	2/1	185.0	0.0339	1.1145	0.4428	1.0248	3.1997	0.7374
2532/F	2/1	177.8	0.0319	1.0409	0.4296	0.9843	3.1505	0.7713
2533/F	2/1	200.4	0.0401	0.9380	0.4260	1.1307	3.7226	0.7060
2534/F	2/1	220.4	0.0273	0.8568	0.3780	0.8751	4.0735	0.6189
2535/F	2/1	198.6	0.0312	0.9631	0.3963	1.0089	4.6491	0.6029
Mean:		205.9	0.0342	0.9645	0.4045	0.9968	3.7892	0.6793
Standard deviation:		16.7	0.0053	0.0798	0.0264	0.0724	0.4671	0.0829
Number of observ. :		(10)	(10)	(10)	(10)	(10)	(10)	(10)
3526/F	3/1	222.5	0.0328	0.8516	0.3707	0.9082	3.4223	0.6440
3527/F	3/1	219.4	0.0440	0.9232	0.4237	1.0205	3.6026	0.7869
3528/F	3/1	225.2	0.0338	0.9439	0.4052	1.0592	4.0470	0.8419
3529/F	3/1	215.1	0.0283	0.9840	0.3940	0.9893	4.2098	0.5930
3530/F	3/1	197.7	0.0394	0.9628	0.4003	0.9076	3.4898	0.7302
3531/F	3/1	201.2	0.0383	0.9548	0.3488	1.0497	3.5873	0.7014
3532/F	3/1	204.6	0.0282	1.0100	0.4096	0.8896	3.6095	0.7492
3533/F	3/1	206.4	0.0379	0.9970	0.4150	0.9606	3.7900	0.6926
3534/F	3/1	195.4	0.0369	0.9552	0.3892	1.0641	3.7765	0.6366
3535/F	3/1	215.2	0.0355	0.8914	0.3685	0.9457	4.2489	0.5496
Mean:		210.3	0.0355	0.9474	0.3925	0.9794	3.7784	0.6926
Standard deviation:		10.6	0.0049	0.0483	0.0235	0.0667	0.2955	0.0893
Number of observ. :		(10)	(10)	(10)	(10)	(10)	(10)	(10)
4526/F	4/1	187.5	0.0378	0.9986	0.3653	1.0373	3.2794	0.6857
4527/F	4/1	207.2	0.0421	0.9375	0.4196	1.0546	3.4645	0.7273
4528/F	4/1	192.4	0.0342	0.9091	0.4109	1.1033	3.7580	0.7780

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4529/F	4/1	201.9	0.0342	1.0038	0.3891	1.0436	3.6785	0.6156
4530/F	4/1	190.3	0.0294	1.0432	0.4033	0.9752	4.1862	0.7655
4531/F	4/1	220.6	0.0331	0.8876	0.3829	0.8901	3.6695	0.5223
4532/F	4/1	203.7	0.0366	0.9211	0.3983	0.9624	3.3376	0.6018
4533/F	4/1	200.7	0.0375	0.9770	0.4573	0.9968	3.9510	0.5935
4534/F	4/1	222.1	0.0326	0.8263	0.4032	0.9140	3.8760	0.6658
4535/F	4/1	231.4	0.0385	0.8996	0.4248	1.0801	4.1588	0.7477
M e a n:		205.8	0.0356	0.9404	0.4055	1.0058	3.7359	0.6703
Standard deviation:		14.7	0.0036	0.0651	0.0253	0.0704	0.3156	0.0854
Number of observ. :		(10)	(10)	(10)	(10)	(10)	(10)	(10)

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Animal No/sex	Group/ Subgroup	Terminal Body wt. (g)	Ovaries	Pituitary gland	Spleen	Thymus	Uterus
				F e m a l e	A n i m a l s		
1526/F	1/1	210.6	0.0475	0.0069	0.2552	0.2067	0.3877
1527/F	1/1	202.4	0.0456	0.0063	0.2056	0.2109	0.2851
1528/F	1/1	221.0	0.0503	0.0065	0.2544	0.2311	0.3537
1529/F	1/1	218.2	0.0349	0.0053	0.2629	0.2556	0.2526
1530/F	1/1	211.2	0.0500	0.0067	0.3037	0.2375	0.2596
1531/F	1/1	198.9	0.0464	0.0056	0.2708	0.1587	0.2585
1532/F	1/1	198.4	0.0510	0.0059	0.3186	0.2380	0.4261
1533/F	1/1	220.6	0.0607	0.0026	0.2431	0.2204	0.3395
1534/F	1/1	235.6	0.0463	0.0053	0.2114	0.1955	0.2036
1535/F	1/1	214.1	0.0584	0.0070	0.2507	0.2732	0.3051
M e a n:		213.1	0.0491	0.0058	0.2576	0.2228	0.3071
Standard deviation:		11.5	0.0071	0.0013	0.0352	0.0323	0.0689
Number of observ. :		(10)	(10)	(10)	(10)	(10)	(10)
2526/F	2/1	226.3	0.0392	0.0040	0.2479	0.1873	0.2074
2527/F	2/1	200.0	0.0457	0.0062	0.2792	0.2296	0.2702
2528/F	2/1	227.3	0.0510	0.0076	0.2936	0.2070	0.2493
2529/F	2/1	208.5	0.0504	0.0044	0.2142	0.3082	0.4864
2530/F	2/1	215.1	0.0590	0.0057	0.2061	0.2715	0.3641
2531/F	2/1	185.0	0.0503	0.0057	0.2468	0.2929	0.6170
2532/F	2/1	177.8	0.0427	0.0034	0.2584	0.2449	0.2273
2533/F	2/1	200.4	0.0442	0.0047	0.3177	0.2375	0.3760
2534/F	2/1	220.4	0.0427	0.0049	0.2478	0.3062	0.1799
2535/F	2/1	198.6	0.0554	0.0067	0.2485	0.2131	0.3000
M e a n:		205.9	0.0480	0.0053	0.2560	0.2498	0.3278
Standard deviation:		16.7	0.0062	0.0013	0.0338	0.0429	0.1371
Number of observ. :		(10)	(10)	(10)	(10)	(10)	(10)
3526/F	3/1	222.5	0.0433	0.0047	0.2444	0.2461	0.2211
3527/F	3/1	219.4	0.0624	0.0054	0.2072	0.3453	0.2541
3528/F	3/1	225.2	0.0495	0.0060	0.2708	0.2823	0.3463
3529/F	3/1	215.1	0.0394	0.0043	0.2265	0.2922	0.2715
3530/F	3/1	197.7	0.0420	0.0048	0.1973	0.2406	0.2527
3531/F	3/1	201.2	0.0646	0.0029	0.2671	0.2533	0.2577
3532/F	3/1	204.6	0.0587	0.0032	0.2556	0.1980	0.3112
3533/F	3/1	206.4	0.0521	0.0076	0.2616	0.1953	0.2834
3534/F	3/1	195.4	0.0362	0.0061	0.1865	0.1591	0.2808
3535/F	3/1	215.2	0.0454	0.0052	0.2198	0.1805	0.2713
M e a n:		210.3	0.0494	0.0050	0.2337	0.2393	0.2750
Standard deviation:		10.6	0.0099	0.0014	0.0305	0.0574	0.0344
Number of observ. :		(10)	(10)	(10)	(10)	(10)	(10)
4526/F	4/1	187.5	0.0361	0.0074	0.1777	0.1948	0.3260
4527/F	4/1	207.2	0.0380	0.0068	0.2286	0.2538	0.2687
4528/F	4/1	192.4	0.0532	0.0068	0.2589	0.2156	0.2768

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Animal No/sex	Group/ Subgroup	Terminal Body wt. (g)	Pituitary gland Ovaries		Spleen	Thymus	Uterus
4529/F	4/1	201.9	0.0515	0.0049	0.2508	0.2059	0.2691
4530/F	4/1	190.3	0.0395	0.0066	0.2207	0.2464	0.2572
4531/F	4/1	220.6	0.0343	0.0055	0.2029	0.2112	0.2691
4532/F	4/1	203.7	0.0471	0.0067	0.2814	0.2167	0.2197
4533/F	4/1	200.7	0.0427	0.0059	0.2282	0.2225	0.2718
4534/F	4/1	222.1	0.0490	0.0058	0.2307	0.1954	0.2738
4535/F	4/1	231.4	0.0693	0.0060	0.2609	0.3158	0.4236
M e a n:		205.8	0.0461	0.0062	0.2341	0.2278	0.2856
Standard deviation:		14.7	0.0105	0.0008	0.0303	0.0364	0.0548
Number of observ. :		(10)	(10)	(10)	(10)	(10)	(10)

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Animal No/sex	Group/ Subgroup	Terminal Body wt. (g)	Adrenal Glands	Brain	Epididymides	Heart	Kidneys	Liver
				M a l e	A n i m a l s			
1026/M	1/1	324.9	3.1154	100.0000	48.0856	63.2006	139.1552	547.7213
1027/M	1/1	289.6	3.5375	100.0000	52.8205	55.9521	142.4135	480.9258
1028/M	1/1	333.8	3.1300	100.0000	52.0859	65.1122	152.2173	626.0770
1029/M	1/1	337.0	3.4948	100.0000	42.5043	58.8754	137.4741	481.3668
1030/M	1/1	324.9	2.9974	100.0000	38.2681	62.3595	152.5618	547.5740
1031/M	1/1	284.3	3.2311	100.0000	43.6795	54.1407	137.5264	447.0240
1032/M	1/1	356.2	3.1430	100.0000	44.9050	61.8377	166.4097	561.2533
1033/M	1/1	308.5	3.0313	100.0000	50.1254	55.8848	148.2701	528.7029
1034/M	1/1	331.3	2.3476	100.0000	44.0279	61.9891	148.9558	550.7218
1035/M	1/1	306.7	2.1263	100.0000	46.4255	61.1644	136.0457	545.8394
M e a n:		319.7	3.0154	100.0000	46.2928	60.0517	146.1030	531.7206
Standard deviation:		22.3	0.4504	0.0000	4.5549	3.6442	9.5181	50.7075
Number of observ. :		(10)	(10)	(10)	(10)	(10)	(10)	(10)
2026/M	2/1	275.9	2.9681	100.0000	44.4526	55.4545	144.1690	461.3369
2027/M	2/1	308.1	2.8434	100.0000	50.9138	57.5575	163.9563	571.4480
2028/M	2/1	286.6	3.1440	100.0000	49.6954	56.6240	148.6206	474.9911
2029/M	2/1	272.0	1.9608	100.0000	42.9110	46.9787	122.3464	396.8326
2030/M	2/1	267.9	2.1285	100.0000	47.4976	48.6242	135.6855	428.6194
2031/M	2/1	275.5	2.7081	100.0000	35.3196	54.1978	145.2544	511.4793
2032/M	2/1	305.3	2.9465	100.0000	45.4427	63.2416	139.1596	499.0546
2033/M	2/1	304.1	3.1779	100.0000	43.8957	50.4723	128.0214	456.8950
2034/M	2/1	281.8	3.0581	100.0000	44.2735	52.1588	143.5384	533.6389
2035/M	2/1	282.8	3.3985	100.0000	44.4635	55.9097	136.7790	573.8656
M e a n:		286.0	2.8334	100.0000	44.8865	54.1219	140.7531	490.8161
Standard deviation:		14.7	0.4583	0.0000	4.2653	4.7683	11.4741	58.4035
Number of observ. :		(10)	(10)	(10)	(10)	(10)	(10)	(10)
3026/M	3/1	290.4	3.4016	100.0000	40.8238	59.4613	154.1546	449.3231
3027/M	3/1	310.9	3.6525	100.0000	45.1221	55.8162	133.0733	501.4457
3028/M	3/1	304.8	2.8737	100.0000	44.6313	58.6061	151.1313	586.7879
3029/M	3/1	282.6	2.7892	100.0000	44.7702	52.1912	137.2932	447.5951
3030/M	3/1	319.6	3.7821	100.0000	46.7081	58.3684	149.3024	494.3296
3031/M	3/1	288.3	2.6606	100.0000	47.4117	52.8823	118.1904	455.5279
3032/M	3/1	318.8	2.4275	100.0000	46.7008	62.5228	136.7322	509.1780
3033/M	3/1	296.3	2.5641	100.0000	41.0956	58.3263	147.7343	490.0839
3034/M	3/1	307.3	2.7379	100.0000	50.7974	51.4325	130.5217	504.2574
3035/M	3/1	298.7	2.8083	100.0000	39.7346	60.3951	148.2143	513.2582
M e a n:		301.8	2.9698	100.0000	44.7796	57.0002	140.6348	495.1787
Standard deviation:		12.7	0.4700	0.0000	3.4216	3.7532	11.3800	40.8284
Number of observ. :		(10)	(10)	(10)	(10)	(10)	(10)	(10)
4026/M	4/1	301.0	3.1652	100.0000	42.0791	59.7154	149.4612	555.7708
4027/M	4/1	288.3	2.9457	100.0000	40.6511	55.8990	148.3649	496.8546
4028/M	4/1	276.5	2.5524	100.0000	46.5426	56.4013	147.6510	446.9647

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Animal No/sex	Group/ Subgroup	Terminal Body wt. (g)	Adrenal Glands	Brain	Epididymides	Heart	Kidneys	Liver
4029/M	4/1	297.6	3.1190	100.0000	45.8028	57.2621	135.7287	526.4650
4030/M	4/1	282.2	3.0768	100.0000	41.6496	53.0077	147.7031	490.3402
4031/M	4/1	311.2	2.4678	100.0000	37.8491	58.6095	148.1666	556.2440
4032/M	4/1	302.2	1.9184	100.0000	41.7455	50.4098	132.2345	464.9554
4033/M	4/1	295.8	3.8894	100.0000	50.7943	64.4186	159.7490	536.2599
4034/M	4/1	317.8	2.3507	100.0000	47.9802	63.7777	138.4017	491.5367
4035/M	4/1	285.0	2.2393	100.0000	43.9156	49.7074	133.6083	430.9359
	M e a n:	295.8	2.7725	100.0000	43.9010	56.9208	144.1069	499.6327
Standard deviation:		13.0	0.5752	0.0000	3.8726	5.0007	8.7392	43.8091
Number of observ. :		(10)	(10)	(10)	(10)	(10)	(10)	(10)

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Animal No/sex	Group/ Subgroup	Terminal Body wt. (g)	Lungs	Pituitary gland Seminal vesicles	Spleen	Testes	Thymus
				Male Animals			
1026/M	1/1	324.9	81.5695	0.3849 70.7760	33.2581	139.0577	32.7500
1027/M	1/1	289.6	90.8636	0.5483 54.5129	30.4724	188.9235	26.2495
1028/M	1/1	333.8	89.6704	0.5647 46.3223	31.9525	141.7758	30.1806
1029/M	1/1	337.0	90.5061	0.5623 50.6315	29.4550	148.8322	23.4386
1030/M	1/1	324.9	83.2053	0.4964 78.6343	30.9620	149.4614	26.2505
1031/M	1/1	284.3	72.1670	0.4638 76.2742	31.1981	153.7181	31.3218
1032/M	1/1	356.2	95.8552	0.6188 62.0586	33.8948	156.9317	27.1080
1033/M	1/1	308.5	81.8491	0.5279 75.2639	31.8438	151.6202	25.6873
1034/M	1/1	331.3	91.0009	0.4177 56.6753	32.3005	153.2068	30.6985
1035/M	1/1	306.7	91.7030	0.3826 69.8344	36.1523	145.9799	27.4290
Mean:		319.7	86.8390	0.4967 64.0984	32.1490	152.9507	28.1114
Standard deviation:		22.3	7.0006	0.0818 11.5959	1.9102	13.7757	2.9611
Number of observ. :		(10)	(10)	(10) (10)	(10)	(10)	(10)
2026/M	2/1	275.9	94.9978	0.5232 59.2587	32.1353	142.5603	21.7398
2027/M	2/1	308.1	93.0706	0.6077 111.1605	28.7379	150.4195	20.7564
2028/M	2/1	286.6	87.5851	0.4882 85.9325	26.9841	145.2257	25.9181
2029/M	2/1	272.0	77.2106	0.4478 46.3000	30.5571	133.9791	19.3439
2030/M	2/1	267.9	74.3480	0.3931 46.6107	28.0585	149.5398	17.7037
2031/M	2/1	275.5	74.7143	0.4644 40.2296	27.0911	110.7070	22.4106
2032/M	2/1	305.3	83.1716	0.4252 53.0816	27.5238	153.1766	24.1171
2033/M	2/1	304.1	72.3278	0.4210 72.1840	28.3089	144.7428	24.9256
2034/M	2/1	281.8	65.9152	0.3382 73.1242	23.9598	141.7202	17.1233
2035/M	2/1	282.8	72.7511	0.4589 72.2217	29.9617	150.5648	25.6353
Mean:		286.0	79.6092	0.4568 66.0103	28.3318	142.2636	21.9674
Standard deviation:		14.7	9.6569	0.0736 21.6152	2.2469	12.4151	3.2089
Number of observ. :		(10)	(10)	(10) (10)	(10)	(10)	(10)
3026/M	3/1	290.4	93.4534	0.5796 77.3909	41.3559	140.0494	21.5925
3027/M	3/1	310.9	70.6175	0.3973 37.9225	27.9847	142.2834	25.8305
3028/M	3/1	304.8	83.2374	0.3889 53.9950	32.0707	146.2677	25.6970
3029/M	3/1	282.6	86.6748	0.4784 61.0068	25.4085	160.6098	25.0573
3030/M	3/1	319.6	77.1558	0.5883 70.9027	29.6969	177.5368	30.3524
3031/M	3/1	288.3	89.9357	0.3986 56.9478	36.6848	153.3357	30.5615
3032/M	3/1	318.8	91.4606	0.4510 41.3389	30.3821	172.9070	28.2435
3033/M	3/1	296.3	113.8508	0.4242 64.9371	27.5851	156.3497	25.5245
3034/M	3/1	307.3	98.9462	0.4093 55.4547	31.7307	160.0367	21.6729
3035/M	3/1	298.7	71.7229	0.4090 67.2586	27.7933	138.9316	17.8721
Mean:		301.8	87.7055	0.4525 58.7155	31.0693	154.8308	25.2404
Standard deviation:		12.7	13.0886	0.0744 12.4033	4.7793	13.3724	4.0064
Number of observ. :		(10)	(10)	(10) (10)	(10)	(10)	(10)
4026/M	4/1	301.0	101.1562	0.3558 72.3397	35.2569	137.1403	26.0804
4027/M	4/1	288.3	87.2385	0.4194 68.0913	32.6576	130.8103	28.7084
4028/M	4/1	276.5	90.5939	0.4525 68.6038	25.1169	149.7204	21.8172

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Animal No/sex	Group/ Subgroup	Terminal Body wt. (g)	Lungs	Pituitary gland Seminal vesicles	Spleen	Testes	Thymus
4029/M	4/1	297.6	91.5615	0.1130	70.6174	32.7668	140.2770	24.1171
4030/M	4/1	282.2	105.3571	0.4102	66.1737	25.4210	150.1884	16.0521
4031/M	4/1	311.2	127.0716	0.3486	54.6777	33.5595	135.9344	23.3025
4032/M	4/1	302.2	80.8881	0.3332	66.4145	31.9103	145.1635	16.8063
4033/M	4/1	295.8	78.9417	0.4410	59.3929	28.0570	169.4217	23.9245
4034/M	4/1	317.8	99.6715	0.5090	46.0182	27.8007	149.5211	26.2829
4035/M	4/1	285.0	78.4454	0.4746	62.1711	27.9961	167.8386	21.3980
	M e a n:	295.8	94.0925	0.3857	63.4500	30.0543	147.6016	22.8489
Standard deviation:		13.0	14.9439	0.1114	8.1215	3.5914	12.8566	4.0197
Number of observ. :		(10)	(10)	(10)	(10)	(10)	(10)	(10)

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Animal No/sex	Group/ Subgroup	Terminal Body wt. (g)	Adrenal Glands	Brain	Heart	Kidneys	Liver	Lungs
				Female Animals				
1526/F	1/1	210.6	3.4415	100.0000	35.3127	93.7555	315.5256	56.1277
1527/F	1/1	202.4	4.0690	100.0000	41.8669	92.5973	418.8450	60.3736
1528/F	1/1	221.0	4.3034	100.0000	44.3159	103.1572	362.9885	78.4360
1529/F	1/1	218.2	3.4062	100.0000	47.7126	123.0692	418.1100	86.1648
1530/F	1/1	211.2	3.3585	100.0000	43.1212	98.1847	377.9774	67.6064
1531/F	1/1	198.9	3.5875	100.0000	37.2241	113.8744	374.4689	64.8902
1532/F	1/1	198.4	3.2536	100.0000	38.5161	102.3811	374.3949	91.6835
1533/F	1/1	220.6	3.3670	100.0000	45.8645	113.8726	477.2195	82.3256
1534/F	1/1	235.6	3.6363	100.0000	46.5159	110.0844	410.3347	77.3040
1535/F	1/1	214.1	4.4517	100.0000	40.2358	100.1138	408.0813	77.7312
Mean:		213.1	3.6875	100.0000	42.0686	105.1090	393.7946	74.2643
Standard deviation:		11.5	0.4295	0.0000	4.1810	9.8350	43.1164	11.5604
Number of observ. :		(10)	(10)	(10)	(10)	(10)	(10)	(10)
2526/F	2/1	226.3	2.8245	100.0000	40.8866	100.3874	441.3475	76.6538
2527/F	2/1	200.0	3.7084	100.0000	41.4519	106.8943	412.3631	54.0635
2528/F	2/1	227.3	4.1446	100.0000	42.3393	107.7458	359.3053	79.0217
2529/F	2/1	208.5	3.4784	100.0000	41.4946	98.7863	391.4388	75.9301
2530/F	2/1	215.1	4.6483	100.0000	42.2984	109.1651	415.9350	69.5041
2531/F	2/1	185.0	3.0459	100.0000	39.7274	91.9488	287.1035	66.1606
2532/F	2/1	177.8	3.0635	100.0000	41.2686	94.5591	302.6530	74.0923
2533/F	2/1	200.4	4.2771	100.0000	45.4197	120.5448	396.8561	75.2633
2534/F	2/1	220.4	3.1828	100.0000	44.1191	102.1448	475.4542	72.2343
2535/F	2/1	198.6	3.2415	100.0000	41.1460	104.7524	482.7260	62.6026
Mean:		205.9	3.5615	100.0000	42.0152	103.6929	396.5182	70.5526
Standard deviation:		16.7	0.6114	0.0000	1.6537	8.1682	65.3991	7.6804
Number of observ. :		(10)	(10)	(10)	(10)	(10)	(10)	(10)
3526/F	3/1	222.5	3.8474	100.0000	43.5244	106.6498	401.8736	75.6280
3527/F	3/1	219.4	4.7694	100.0000	45.8971	110.5411	390.2489	85.2375
3528/F	3/1	225.2	3.5800	100.0000	42.9270	112.2124	428.7435	89.1942
3529/F	3/1	215.1	2.8725	100.0000	40.0406	100.5339	427.8182	60.2617
3530/F	3/1	197.7	4.0925	100.0000	41.5708	94.2685	362.4534	75.8445
3531/F	3/1	201.2	4.0133	100.0000	36.5260	109.9318	375.7014	73.4631
3532/F	3/1	204.6	2.7922	100.0000	40.5565	88.0765	357.3676	74.1786
3533/F	3/1	206.4	3.8000	100.0000	41.6250	96.3409	380.1254	69.4640
3534/F	3/1	195.4	3.8684	100.0000	40.7469	111.4070	395.3708	66.6524
3535/F	3/1	215.2	3.9879	100.0000	41.3439	106.0940	476.6564	61.6536
Mean:		210.3	3.7624	100.0000	41.4758	103.6056	399.6359	73.1578
Standard deviation:		10.6	0.5796	0.0000	2.4458	8.3604	36.2210	9.2626
Number of observ. :		(10)	(10)	(10)	(10)	(10)	(10)	(10)
4526/F	4/1	187.5	3.7814	100.0000	36.5860	103.8829	328.4143	68.6642
4527/F	4/1	207.2	4.4944	100.0000	44.7591	112.5000	369.5686	77.5793
4528/F	4/1	192.4	3.7619	100.0000	45.2004	121.3596	413.3726	85.5812

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Animal No/sex	Group/ Subgroup	Terminal Body wt. (g)	Adrenal Glands	Brain	Heart	Kidneys	Liver	Lungs
4529/F	4/1	201.9	3.4045	100.0000	38.7625	103.9670	366.4529	61.3263
4530/F	4/1	190.3	2.8157	100.0000	38.6591	93.4771	401.2694	73.3743
4531/F	4/1	220.6	3.7283	100.0000	43.1359	100.2809	413.4270	58.8509
4532/F	4/1	203.7	3.9706	100.0000	43.2394	104.4876	362.3408	65.3360
4533/F	4/1	200.7	3.8350	100.0000	46.8101	102.0195	404.3909	60.7425
4534/F	4/1	222.1	3.9449	100.0000	48.7877	110.6141	469.0569	80.5754
4535/F	4/1	231.4	4.2756	100.0000	47.2185	120.0711	462.3079	83.1140
M e a n:		205.8	3.8012	100.0000	43.3159	107.2660	399.0601	71.5144
Standard deviation:		14.7	0.4585	0.0000	4.0928	8.8047	44.2424	9.8953
Number of observ. :		(10)	(10)	(10)	(10)	(10)	(10)	(10)

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Animal No/sex	Group/ Subgroup	Terminal Body wt. (g)	Pituitary gland Ovaries	Thymus	Spleen		Uterus
				Female	Animals		
1526/F	1/1	210.6	5.1960	0.7527	27.8952	22.6006	42.3774
1527/F	1/1	202.4	4.5201	0.6226	20.3991	20.9236	28.2871
1528/F	1/1	221.0	5.7935	0.7502	29.2956	26.6073	40.7263
1529/F	1/1	218.2	4.0063	0.6054	30.1974	29.3604	29.0129
1530/F	1/1	211.2	4.9580	0.6614	30.0905	23.5283	25.7188
1531/F	1/1	198.9	4.7713	0.5738	27.8418	16.3195	26.5753
1532/F	1/1	198.4	4.9889	0.5817	31.1659	23.2734	41.6712
1533/F	1/1	220.6	6.7695	0.2882	27.1082	24.5753	37.8665
1534/F	1/1	235.6	5.3538	0.6134	24.4430	22.6028	23.5352
1535/F	1/1	214.1	6.4681	0.7704	27.7545	30.2415	33.7780
Mean:		213.1	5.2825	0.6220	27.6191	24.0033	32.9549
Standard deviation:		11.5	0.8533	0.1386	3.1757	4.0543	7.2193
Number of observ. :		(10)	(10)	(10)	(10)	(10)	(10)
2526/F	2/1	226.3	4.3495	0.4413	27.5143	20.7816	23.0128
2527/F	2/1	200.0	4.6368	0.6240	28.3279	23.2955	27.4097
2528/F	2/1	227.3	5.4820	0.8176	31.5359	22.2354	26.7817
2529/F	2/1	208.5	4.8828	0.4278	20.7682	29.8782	47.1633
2530/F	2/1	215.1	6.6804	0.6422	23.3418	30.7381	41.2297
2531/F	2/1	185.0	4.5106	0.5141	22.1457	26.2829	55.3642
2532/F	2/1	177.8	4.1009	0.3242	24.8271	23.5304	21.8392
2533/F	2/1	200.4	4.7079	0.5001	33.8706	25.3165	40.0894
2534/F	2/1	220.4	4.9833	0.5719	28.9202	35.7359	21.0030
2535/F	2/1	198.6	5.7510	0.6954	25.8012	22.1258	31.1497
Mean:		205.9	5.0085	0.5559	26.7053	25.9920	33.5043
Standard deviation:		16.7	0.7689	0.1447	4.1442	4.7452	11.8217
Number of observ. :		(10)	(10)	(10)	(10)	(10)	(10)
3526/F	3/1	222.5	5.0823	0.5541	28.6996	28.9002	25.9605
3527/F	3/1	219.4	6.7592	0.5875	22.4499	37.4050	27.5304
3528/F	3/1	225.2	5.2453	0.6304	28.6870	29.9101	36.6891
3529/F	3/1	215.1	4.0064	0.4347	23.0180	29.6986	27.5914
3530/F	3/1	197.7	4.3656	0.4938	20.4886	24.9908	26.2464
3531/F	3/1	201.2	6.7618	0.3019	27.9736	26.5317	26.9845
3532/F	3/1	204.6	5.8069	0.3194	25.3085	19.6080	30.8154
3533/F	3/1	206.4	5.2286	0.7629	26.2403	19.5928	28.4270
3534/F	3/1	195.4	3.7880	0.6429	19.5296	16.6577	29.3988
3535/F	3/1	215.2	5.0878	0.5786	24.6625	20.2523	30.4332
Mean:		210.3	5.2132	0.5306	24.7058	25.3547	29.0077
Standard deviation:		10.6	1.0209	0.1453	3.2950	6.3841	3.1620
Number of observ. :		(10)	(10)	(10)	(10)	(10)	(10)
4526/F	4/1	187.5	3.6159	0.7424	17.7963	19.5108	32.6443
4527/F	4/1	207.2	4.0568	0.7208	24.3874	27.0748	28.6604
4528/F	4/1	192.4	5.8544	0.7490	28.4832	23.7208	30.4499

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Animal No/sex	Group/ Subgroup	Terminal Body wt. (g)	Ovaries	Pituitary gland	Spleen	Thymus	Uterus
4529/F	4/1	201.9	5.1315	0.4835	24.9815	20.5161	26.8121
4530/F	4/1	190.3	3.7878	0.6296	21.1555	23.6186	24.6512
4531/F	4/1	220.6	3.8611	0.6231	22.8652	23.7896	30.3167
4532/F	4/1	203.7	5.1111	0.7302	30.5548	23.5250	23.8555
4533/F	4/1	200.7	4.3704	0.6069	23.3515	22.7702	27.8189
4534/F	4/1	222.1	5.9282	0.6974	27.9191	23.6419	33.1336
4535/F	4/1	231.4	7.7008	0.6630	29.0017	35.1028	47.0840
M e a n:		205.8	4.9418	0.6646	25.0496	24.3270	30.5426
Standard deviation:		14.7	1.2845	0.0822	3.9697	4.2958	6.5753
Number of observ. :		(10)	(10)	(10)	(10)	(10)	(10)

	Raw Data Listing of Gross Observations	Appendix H

Key to Abbreviations

LN	=	Lymph Node
SC	=	Spinal Cord
Submandib/Max	=	Submandibular/Submaxillary

Corresponding exposure levels for each group were as follows:

Group 1 - 0 ppm
Group 2 - 120 ppm
Group 3 - 1200 ppm
Group 4 - 12000 ppm

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Animal number	Sex	Group/ Subgroup	Date data taken	Tissue / Observation(s) Locator, Color, General, Measurements, Severity levels			
1026	M	1/1	28-Aug-03	Within normal limits			
1027	M	1/1	28-Aug-03	Within normal limits			
1028	M	1/1		Epididymides			
			28-Aug-03	Cyst, Head, Yellow, Fluid, 0.2 - 0.5 cm, Right			
				Tissues marked 'Within normal limits':			
			28-Aug-03	Adrenal Glands	Aorta	Brain	Cecum
				Colon	Duodenum	Esophagus	Eyes
				Femur	Heart	Ileum	Jejunum
				Kidneys	Lacrimal gland	Larynx	Liver
				Lungs	Mammary-protocol	Mediastinal LN	Mesenteric LN
				Nerve	Nose/Turbinates	Optic nerve	Pancreas
				Parathyroid	Pituitary gland	Prostate	Rectum/Low Colon
				Salivary glands	Seminal vesicles	Skeletal muscle	Skin-protocol
				Cervical SC	Thoracic SC	Lumbar SC	Spleen
				Sternum	Stomach	Submandib/Max LN	Testes
				Thymus	Thyroid	Trachea	Urinary bladder
				Zymbal's gland			
1029	M	1/1		Urinary bladder			
			28-Aug-03	Distended, , , , , Slight			
				Tissues marked 'Within normal limits':			
			28-Aug-03	Adrenal Glands	Aorta	Brain	Cecum
				Colon	Duodenum	Epididymides	Esophagus
				Eyes	Femur	Heart	Ileum
				Jejunum	Kidneys	Lacrimal gland	Larynx
				Liver	Lungs	Mammary-protocol	Mediastinal LN
				Mesenteric LN	Nerve	Nose/Turbinates	Optic nerve
				Pancreas	Parathyroid	Pituitary gland	Prostate
				Rectum/Low Colon	Salivary glands	Seminal vesicles	Skeletal muscle
				Skin-protocol	Cervical SC	Thoracic SC	Lumbar SC
				Spleen	Sternum	Stomach	Submandib/Max LN
				Testes	Thymus	Thyroid	Trachea
				Zymbal's gland			
1030	M	1/1	28-Aug-03	Within normal limits			
1031	M	1/1		Lungs			
			28-Aug-03	Discolored, Left lobe(s), Red, Foci, </= 0.1 cm, Slight			
				Tissues marked 'Within normal limits':			
			28-Aug-03	Adrenal Glands	Aorta	Brain	Cecum

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Animal number	Sex	Group/ Subgroup	Date data taken	Tissue / Observation(s) Locator, Color, General, Measurements, Severity levels			
1031	M	1/1	28-Aug-03	Tissues marked 'Within normal limits':			
				Colon	Duodenum	Epididymides	Esophagus
				Eyes	Femur	Heart	Ileum
				Jejunum	Kidneys	Lacrimal gland	Larynx
				Liver	Mammary-protocol	Mediastinal LN	Mesenteric LN
				Nerve	Nose/Turbinates	Optic nerve	Pancreas
				Parathyroid	Pituitary gland	Prostate	Rectum/Low Colon
				Salivary glands	Seminal vesicles	Skeletal muscle	Skin-protocol
				Cervical SC	Thoracic SC	Lumbar SC	Spleen
				Sternum	Stomach	Submandib/Max LN	Testes
				Thymus	Thyroid	Trachea	Urinary bladder
				Zymbal's gland			
1032	M	1/1	28-Aug-03	Within normal limits			
1033	M	1/1	28-Aug-03	Within normal limits			
1034	M	1/1	29-Aug-03	Within normal limits			
1035	M	1/1	29-Aug-03	Within normal limits			
2026	M	2/1	28-Aug-03	Within normal limits			
2027	M	2/1	28-Aug-03	Within normal limits			
2028	M	2/1	28-Aug-03	Within normal limits			
2029	M	2/1	28-Aug-03	Within normal limits			
2030	M	2/1	28-Aug-03	Within normal limits			
2031	M	2/1	28-Aug-03	Within normal limits			
2032	M	2/1	28-Aug-03	Within normal limits			
2033	M	2/1	28-Aug-03	Within normal limits			
2034	M	2/1	29-Aug-03	Within normal limits			
2035	M	2/1		Skin (other)			
			29-Aug-03	Hair Thin/Absent, Forelegs, , , , Slight			
				Tissues marked 'Within normal limits':			
			29-Aug-03	Adrenal Glands	Aorta	Brain	Cecum

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Animal number	Sex	Group/ Subgroup	Date data taken	Tissue / Observation(s) Locator, Color, General, Measurements, Severity levels			
2035	M	2/1	29-Aug-03	Tissues marked 'Within normal limits':			
				Colon	Duodenum	Epididymides	Esophagus
				Eyes	Femur	Heart	Ileum
				Jejunum	Kidneys	Lacrimal gland	Larynx
				Liver	Lungs	Mammary-protocol	Mediastinal LN
				Mesenteric LN	Nerve	Nose/Turbinates	Optic nerve
				Pancreas	Parathyroid	Pituitary gland	Prostate
				Rectum/Low Colon	Salivary glands	Seminal vesicles	Skeletal muscle
				Skin-protocol	Cervical SC	Thoracic SC	Lumbar SC
				Spleen	Sternum	Stomach	Submandib/Max LN
				Testes	Thymus	Thyroid	Trachea
				Urinary bladder	Zymbal's gland		
3026	M	3/1	28-Aug-03	Within normal limits			
3027	M	3/1	28-Aug-03	Within normal limits			
3028	M	3/1	28-Aug-03	Within normal limits			
3029	M	3/1	28-Aug-03	Within normal limits			
3030	M	3/1	28-Aug-03	Within normal limits			
3031	M	3/1	28-Aug-03	Within normal limits			
3032	M	3/1	28-Aug-03	Within normal limits			
3033	M	3/1	28-Aug-03	Within normal limits			
3034	M	3/1	29-Aug-03	Within normal limits			
3035	M	3/1	29-Aug-03	Within normal limits			
4026	M	4/1	28-Aug-03	Within normal limits			
4027	M	4/1	28-Aug-03	Within normal limits			
4028	M	4/1	28-Aug-03	Within normal limits			
4029	M	4/1	28-Aug-03	Within normal limits			
4030	M	4/1	28-Aug-03	Within normal limits			

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Animal number	Sex	Group/ Subgroup	Date data taken	Tissue / Observation(s) Locator, Color, General, Measurements, Severity levels
4031	M	4/1	28-Aug-03	Within normal limits
4032	M	4/1	28-Aug-03	Within normal limits
4033	M	4/1	28-Aug-03	Within normal limits
4034	M	4/1	29-Aug-03	Within normal limits
4035	M	4/1	29-Aug-03	Within normal limits
1526	F	1/1	28-Aug-03	Within normal limits
1527	F	1/1	28-Aug-03	Within normal limits
1528	F	1/1	28-Aug-03	Within normal limits
1529	F	1/1		Ileum
			28-Aug-03	Abnormal Contents, , Yellow, , , yellow thin fluid in ileum
				Tissues marked 'Within normal limits':
			28-Aug-03	Adrenal Glands, Aorta, Brain, Cecum Colon, Duodenum, Esophagus, Eyes Femur, Heart, Jejunum, Kidneys Lacrimal gland, Larynx, Liver, Lungs Mammary-protocol, Mediastinal LN, Mesenteric LN, Nerve Nose/Turbinates, Optic nerve, Ovaries, Pancreas Parathyroid, Pituitary gland, Rectum/Low Colon, Salivary glands Skeletal muscle, Skin-protocol, Cervical SC, Thoracic SC Lumbar SC, Spleen, Sternum, Stomach Submandib/Max LN, Thymus, Thyroid, Trachea Urinary bladder, Uterus, Zymbal's gland
1530	F	1/1	28-Aug-03	Within normal limits
1531	F	1/1	28-Aug-03	Within normal limits
1532	F	1/1	28-Aug-03	Within normal limits
1533	F	1/1	29-Aug-03	Within normal limits
1534	F	1/1		Kidneys
			29-Aug-03	Dilated Pelvis, Right, , , , Slight

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Animal number	Sex	Group/ Subgroup	Date data taken	Tissue / Observation(s) Locator, Color, General, Measurements, Severity levels			
1534	F	1/1		Tissues marked 'Within normal limits':			
			29-Aug-03	Adrenal Glands	Aorta	Brain	Cecum
				Colon	Duodenum	Esophagus	Eyes
				Femur	Heart	Ileum	Jejunum
				Lacrimal gland	Larynx	Liver	Lungs
				Mammary-protocol	Mediastinal LN	Mesenteric LN	Nerve
				Nose/Turbinates	Optic nerve	Ovaries	Pancreas
				Parathyroid	Pituitary gland	Rectum/Low Colon	Salivary glands
				Skeletal muscle	Skin-protocol	Cervical SC	Thoracic SC
				Lumbar SC	Spleen	Sternum	Stomach
				Submandib/Max LN	Thymus	Thyroid	Trachea
				Urinary bladder	Uterus	Zymbal's gland	
1535	F	1/1	29-Aug-03	Within normal limits			
2526	F	2/1	28-Aug-03	Within normal limits			
2527	F	2/1		Ileum			
			28-Aug-03	Abnormal Contents, , Red, , , Moderate thin red fluid found in ileum at time of necropsy			
				Submandib/Max LN			
			28-Aug-03	Enlarged, , , , , Severe			
				Tissues marked 'Within normal limits':			
			28-Aug-03	Adrenal Glands	Aorta	Brain	Cecum
				Colon	Duodenum	Esophagus	Eyes
				Femur	Heart	Jejunum	Kidneys
				Lacrimal gland	Larynx	Liver	Lungs
				Mammary-protocol	Mediastinal LN	Mesenteric LN	Nerve
				Nose/Turbinates	Optic nerve	Ovaries	Pancreas
				Parathyroid	Pituitary gland	Rectum/Low Colon	Salivary glands
				Skeletal muscle	Skin-protocol	Cervical SC	Thoracic SC
				Lumbar SC	Spleen	Sternum	Stomach
				Thymus	Thyroid	Trachea	Urinary bladder
				Uterus	Zymbal's gland		
2528	F	2/1	28-Aug-03	Within normal limits			
2529	F	2/1	28-Aug-03	Within normal limits			
2530	F	2/1	28-Aug-03	Within normal limits			
2531	F	2/1		Thymus			
			28-Aug-03	Discolored, Left lobe, Red, Area, 0.6 - 0.9 cm, Severe			

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Animal number	Sex	Group/ Subgroup	Date data taken	Tissue / Observation(s) Locator, Color, General, Measurements, Severity levels			
				Uterus			
			28-Aug-03	Distended, Bilateral horns, , , , Slight			
				Tissues marked 'Within normal limits':			
			28-Aug-03	Adrenal Glands	Aorta	Brain	Cecum
				Colon	Duodenum	Esophagus	Eyes
				Femur	Heart	Ileum	Jejunum
				Kidneys	Lacrimal gland	Larynx	Liver
				Lungs	Mammary-protocol	Mediastinal LN	Mesenteric LN
				Nerve	Nose/Turbinates	Optic nerve	Ovaries
				Pancreas	Parathyroid	Pituitary gland	Rectum/Low Colon
				Salivary glands	Skeletal muscle	Skin-protocol	Cervical SC
				Thoracic SC	Lumbar SC	Spleen	Sternum
				Stomach	Submandib/Max LN	Thyroid	Trachea
				Urinary bladder	Zymbal's gland		
2532	F	2/1	28-Aug-03	Within normal limits			
2533	F	2/1	29-Aug-03	Within normal limits			
2534	F	2/1	29-Aug-03	Within normal limits			
2535	F	2/1	29-Aug-03	Within normal limits			
3526	F	3/1	28-Aug-03	Within normal limits			
3527	F	3/1	28-Aug-03	Within normal limits			
3528	F	3/1	28-Aug-03	Within normal limits			
3529	F	3/1		Ileum			
			28-Aug-03	Abnormal Contents, , Red, , , Moderate			
				red thin fluid found in ileum at time of necropsy			
				Submandib/Max LN			
			28-Aug-03	Enlarged, , , , , Moderate			
				Thymus			
			28-Aug-03	Discolored, Left lobe, Red, Foci, </= 0.1 cm, Slight			
				Lymph Node,other			
			28-Aug-03	Discolored, Retroperitoneal, Black, Foci, </= 0.1 cm, Moderate			
				Tissues marked 'Within normal limits':			
			28-Aug-03	Adrenal Glands	Aorta	Brain	Cecum
				Colon	Duodenum	Esophagus	Eyes
				Femur	Heart	Jejunum	Kidneys

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Animal number	Sex	Group/ Subgroup	Date data taken	Tissue / Observation(s) Locator, Color, General, Measurements, Severity levels			
3529	F	3/1	28-Aug-03	Tissues marked 'Within normal limits':			
				Lacrimal gland	Larynx	Liver	Lungs
				Mammary-protocol	Mediastinal LN	Mesenteric LN	Nerve
				Nose/Turbinates	Optic nerve	Ovaries	Pancreas
				Parathyroid	Pituitary gland	Rectum/Low Colon	Salivary glands
				Skeletal muscle	Skin-protocol	Cervical SC	Thoracic SC
				Lumbar SC	Spleen	Sternum	Stomach
				Thyroid	Trachea	Urinary bladder	Uterus
				Zymbal's gland			
3530	F	3/1	28-Aug-03	Within normal limits			
3531	F	3/1	28-Aug-03	Within normal limits			
3532	F	3/1	28-Aug-03	Within normal limits			
3533	F	3/1	29-Aug-03	Within normal limits			
3534	F	3/1		Liver			
			29-Aug-03	Hernia, Left lobe, , , 0.6 - 0.9 cm, Moderate Pretruded through thoracic cavity			
				Tissues marked 'Within normal limits':			
			29-Aug-03	Adrenal Glands	Aorta	Brain	Cecum
				Colon	Duodenum	Esophagus	Eyes
				Femur	Heart	Ileum	Jejunum
				Kidneys	Lacrimal gland	Larynx	Lungs
				Mammary-protocol	Mediastinal LN	Mesenteric LN	Nerve
				Nose/Turbinates	Optic nerve	Ovaries	Pancreas
				Parathyroid	Pituitary gland	Rectum/Low Colon	Salivary glands
				Skeletal muscle	Skin-protocol	Cervical SC	Thoracic SC
				Lumbar SC	Spleen	Sternum	Stomach
				Submandib/Max LN	Thymus	Thyroid	Trachea
				Urinary bladder	Uterus	Zymbal's gland	
3535	F	3/1		Jejunum			
			29-Aug-03	Abnormal Contents, , Yellow, Thin fluid, , Moderate			
				Spleen			
			29-Aug-03	Irregular Surface, Parenchyma, , , , Slight			
				Submandib/Max LN			
			29-Aug-03	Enlarged, , , , , Severe			
				Tissues marked 'Within normal limits':			
			29-Aug-03	Adrenal Glands	Aorta	Brain	Cecum

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Animal number	Sex	Group/ Subgroup	Date data taken	Tissue / Observation(s) Locator, Color, General, Measurements, Severity levels			
3535	F	3/1	29-Aug-03	Tissues marked 'Within normal limits':			
				Colon	Duodenum	Esophagus	Eyes
				Femur	Heart	Ileum	Kidneys
				Lacrimal gland	Larynx	Liver	Lungs
				Mammary-protocol	Mediastinal LN	Mesenteric LN	Nerve
				Nose/Turbinates	Optic nerve	Ovaries	Pancreas
				Parathyroid	Pituitary gland	Rectum/Low Colon	Salivary glands
				Skeletal muscle	Skin-protocol	Cervical SC	Thoracic SC
				Lumbar SC	Sternum	Stomach	Thymus
				Thyroid	Trachea	Urinary bladder	Uterus
				Zymbal's gland			
4526	F	4/1	28-Aug-03	Within normal limits			
4527	F	4/1	28-Aug-03	Within normal limits			
4528	F	4/1	28-Aug-03	Within normal limits			
4529	F	4/1	28-Aug-03	Within normal limits			
4530	F	4/1	28-Aug-03	Within normal limits			
4531	F	4/1		Ileum			
			28-Aug-03	Abnormal Contents, , Yellow, Fluid, , Moderate			
				Thymus			
			28-Aug-03	Discolored, Bilateral, Tan, Foci, </= 0.1 cm, Slight			
				Tissues marked 'Within normal limits':			
			28-Aug-03	Adrenal Glands	Aorta	Brain	Cecum
				Colon	Duodenum	Esophagus	Eyes
				Femur	Heart	Jejunum	Kidneys
				Lacrimal gland	Larynx	Liver	Lungs
				Mammary-protocol	Mediastinal LN	Mesenteric LN	Nerve
				Nose/Turbinates	Optic nerve	Ovaries	Pancreas
				Parathyroid	Pituitary gland	Rectum/Low Colon	Salivary glands
				Skeletal muscle	Skin-protocol	Cervical SC	Thoracic SC
				Lumbar SC	Spleen	Sternum	Stomach
				Submandib/Max LN	Thyroid	Trachea	Urinary bladder
				Uterus	Zymbal's gland		
4532	F	4/1	28-Aug-03	Within normal limits			
4533	F	4/1	29-Aug-03	Within normal limits			

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Animal number	Sex	Group/ Subgroup	Date data taken	Tissue / Observation(s) Locator, Color, General, Measurements, Severity levels
4534	F	4/1	29-Aug-03	Within normal limits
4535	F	4/1	29-Aug-03	Within normal limits

	Equipment List	Appendix I

Exposure Chamber
1000 Liter glass and stainless steel chamber (Wahmann)

Flowmeters
Top Trak™ Mass Flow Meter, sizes 0 - 100 sccm, 0 - 1 and 0 - 10 Lpm, Model 821-1 (Sierra Instruments), calibrated prestudy with Gilian Gilibrator Generator, S/N 646-L and 569-S
Flowmeter, size 0 - 40 Lpm (Dwyer®)

Pressure Gauges
MG Industries backpressure gauges, P/N 1D206 and 1D201

Regulator
MG Industries, Series 300

Valve
Metering Valve, Model SS-4L Series (Nupro® Co.)

Tubing
Teflon® size ¼"
Plastic, sizes ¼" and ½" (Norton, Baxter)
Stainless steel, size ½"
Clear plastic 1/8" (Tygon)
"T"-tube

Vacuum Pump
Thomas Industries Inc., Model 707CM 50
GAST® vacuum pump, Model 169-01

Air Analyzer
MIRAN® 1A-CVF Ambient Air Analyzer (Wilks) with a Cole Parmer Strip Chart Recorder, Model 201, and a Micronta® LCD Benchtop Digital Multimeter No. 22-195
Balston® Microfibre™ Disposable Filter Unit, Grade DQ, was attached in-line

	Equipment List	Appendix I

Particle Sizer

TSI Aerodynamic Particle Sizer, Model 331001 and a DELL computer, Model 486P/25, equipped with an Epson LQ-570+ Dot matrix printer, Model P630B

Environmental Monitoring

VWR Temperature and Humidity Gauge
Digital Sound Level Meter, Model 840029 (SPER Scientific)
Photometer 1 Light Meter (Quantum Instruments)

Chamber Air Flow

Dwyer® Magnehelic® gauge, calibrated prestudy with Side Trak™ III, with Digital Meter, Model 831-N2 (Sierra Instruments Inc.)

Chamber Static Pressure

Dwyer® Magnehelic® gauge (Dwyer® Instruments Inc.); calibrated prestudy with a Dwyer® Mark II Manometer, Model 25 (Dwyer® Instruments Inc.) and gas tight syringe (Hamilton, Co.)

	MIRAN® Calibration	Appendix J

Methodology for Propane

Settings: The instrument settings for the unit are summarized below:

Wavelength, microns	10.9
Pathlength, dial setting	8.5
Slit width, mm	1
Range, absorbance	1
Response, seconds	1[a]
Gain	High
Chart speed, cm/min	1
Chart volts	1

Calibrations: The MIRAN® was turned on and allowed to warm up for approximately 10 minutes. The cell was flushed with room air for approximately one minute. The loop was closed, the unit was zeroed and the calibration series was performed as shown below. The resultant data were plotted to obtain a calibration curve. Each operator used a separate syringe for calibration.

Injection Volume (µL)	Calculated Concentration[1] (ppm)	Absorbance Operator 1 (volts)	Absorbance Operator 2 (volts)	Absorbance Average (volts)
540	96	0.0035	0.0079	0.0057
680	121	0.0053	0.0097	0.0075
7000	1241	0.0792	0.0822	0.0807
68,000	12057	0.619	0.707	0.663
82,000	14539	0.832	0.846	0.839

[1]Calculated Conc. (ppm) = $\frac{\text{Volume injected (µL)}}{5.64\text{L}}$

where: 5.64L = volume of MIRAN® closed-loop

[a]On 15 August 2003 (Exposure Day 2) due to background noise, the response was changed to 40 seconds.

	MIRAN® Calibration	Appendix J

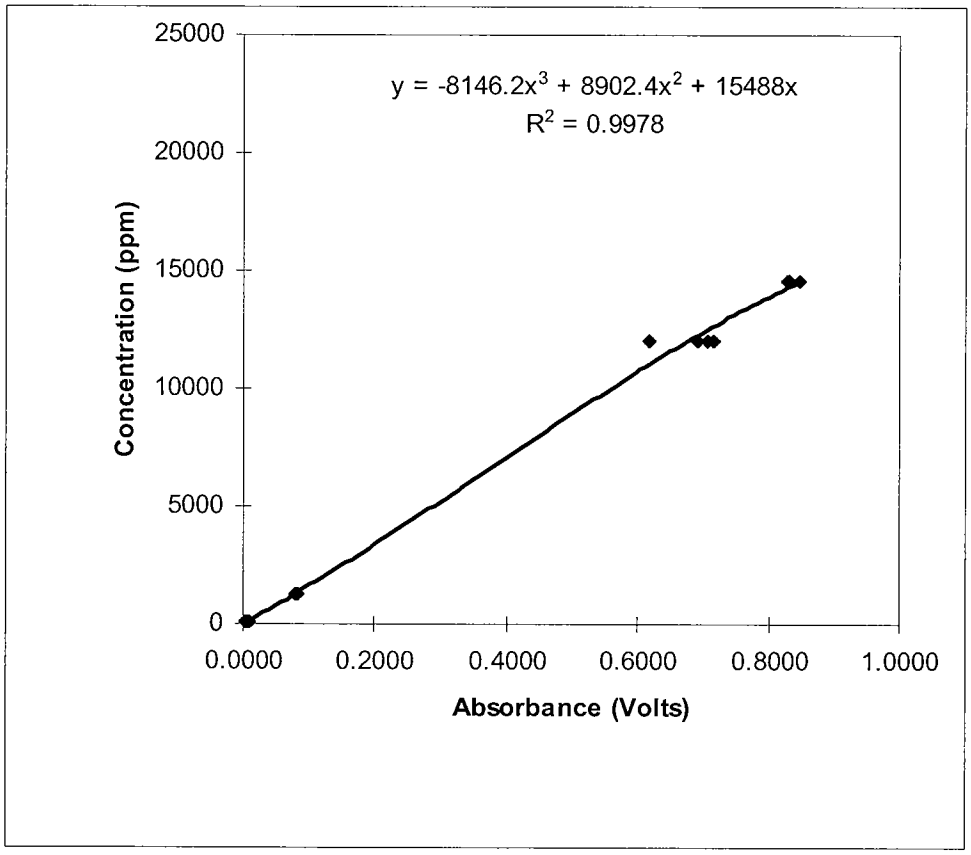
Calibration Checks: A three-point calibration check of the MIRAN® was performed prior to the exposure. The parameters are shown below:

Injection Volume (µL)	Calculated Concentration (ppm)	Expected Absorbance Reading (volts)	Acceptable Absorbance Range (volts)
680	121	0.0067	0.0057 – 0.0077
7000	1241	0.0816	0.0694 – 0.0938
68000	12057	0.684	0.581 – 0.787

The absorbance was recorded after each injection. The absorbance was considered satisfactory if it was within 15% of the original calibration series. If the absorbance value fell outside the 15% range, the injection was rechecked as follows. The volume for the value that was out of range was reinjected twice. The closer pair of the three injections were averaged and the results were compared to the original curve. If the average of the pair was within the 15% range, the original was accepted. If the value of the average was outside the 15% range, the Study Director decided if a new graph was to be prepared.

	MIRAN® Calibration	Appendix J

Calibration Curve for Propane



	Chamber Distribution Results	Appendix K

Group (target)	Date	Port	IR Conc (ppm)	Ratio to H-1
2 (120 ppm)	5 August 2003	H-1	119	1.00
		H-2	127	1.07
		H-7	129	1.08
		H-8	125	1.05
3 (1200 ppm)	5 August 2003	H-1	1230	1.00
		H-2	1240	1.01
		H-7	1230	1.00
		H-8	1250	1.02
4 (12000 ppm)	5 August 2003	H-1	11800	1.00
		H-2	11700	0.99
		H-7	11500	0.97
		H-8	11600	0.98

	Testing Room Environmental Monitoring	Appendix L

Interval	Location	Test Substance (ppm)[a]	Light (Ft Candles)	Noise (dB)	Oxygen (%)	Particle Sizing (mg/m^3)[b]
Pretest	Room	0	32.1	58.3	NM	NM
	Group 1	0	NM	NM	21	2.33×10^{-3}
	Group 2	123	NM	NM	21	2.17×10^{-3}
	Group 3	1246	NM	NM	21	2.52×10^{-3}
	Group 4	11640	NM	NM	21	2.50×10^{-3}
Exposure 1	Room	0	36.0	59.1	NM	
	Group 1	0	NM	NM	21	
	Group 2	119	NM	NM	21	
	Group 3	1320	NM	NM	21	
	Group 4	12530	NM	NM	21	
Exposure 8	Room	0	35.8	64.8	NM	
	Group 1	0	NM	NM	21	
	Group 2	120	NM	NM	21	
	Group 3	1280	NM	NM	21	
	Group 4	12380	NM	NM	21	
Exposure 14	Room	0	35.1	59.0	NM	
	Group 1	0	NM	NM	21	
	Group 2	121	NM	NM	21	
	Group 3	1213	NM	NM	21	
	Group 4	12000	NM	NM	21	

NM = Not Measured

[a]Values presented are the daily average for the chamber samples and a single time point for the room air samples.

[b]Pretest results presented. For on-test results, see CMR (Appendix A).

Appendix M

PROTOCOL

PROPANE

A 2-WEEK RANGE-FINDING INHALATION TOXICITY STUDY IN THE RAT VIA WHOLE-BODY EXPOSURES

CONFIDENTIAL

HLS Study No.:	**03-6146**
Protocol No.:	**Final**
Date:	**21 July 2003**

PROTOCOL SIGNATURES / PREFACE

(Confidential Information - to be distributed on a need-to-know basis)

Study Title: Propane: A 2-Week Range-Finding Inhalation Toxicity Study in the Rat via Whole-Body Exposures

HLS Study No.: 03-6146

This is the Final Protocol. It has been reviewed and approved by:

[redacted] 30 July 03
Date

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1. INTRODUCTION

HLS Study No.	03-6146
Study Title	Propane: A 2-Week Range-Finding Inhalation Toxicity Study in the Rat via Whole-Body Exposures
Testing Facility	Huntingdon Life Sciences 100 Mettlers Road P.O. Box 2360 East Millstone, NJ 08875-2360
Purpose	This study is designed to provide a preliminary assessment of the toxicity of the test substance when administered via whole-body inhalation to rats for 2 weeks in order to determine exposure levels for a subsequent OECD 422 inhalation study 03-4245.

2. STUDY PERSONNEL

Study Director
Alternate Contact

[redacted]

Additional personnel will be documented in the study file and presented in the final report.

3. PROPOSED STUDY DATES

Study Initiation	Date Study Director signs protocol
Receipt of Test Animals	29 July 2003
First Day of Treatment	14 August 2003 (Experimental Start)
Last Day of Treatment	28 August 2003
Necropsy - Termination	28-29 August 2003
Experimental Termination	29 August 2003 (Date of last data collection)
Submission of Audited Draft Report	26 November 2003
Study Completion	Date final report is signed by Study Director

4. EXPERIMENTAL DESIGN

4.1. STUDY SUMMARY

Group	Test Substance	Exposure Level[a]	Number of Animals[b]	
		ppm	Males	Females
1	**Air Control**	0	10	10
2	**Propane**	120	10	10
3	**Propane**	1200	10	10
4	**Propane**	12000	10	10

[a]Exposures will be 6 hours per day for 7 consecutive days per week for 2 weeks for a total of at least 14 exposures. Exposure levels are expressed as ppm of test substance. The exposures will be conducted via whole-body exposure.

[b]Complete postmortem evaluations will be performed on animals at termination of the study and on animals which are found dead or euthanized in a moribund condition during the course of the study.

The first day of exposures will be defined as Day 0 of the study.

4.2. JUSTIFICATION FOR ROUTE, DURATION AND FREQUENCY

The inhalation route is one of the potential routes of human exposure to this test substance. The duration of the study and frequency of exposures are considered to be the minimum necessary for determining exposure levels for a subsequent OECD 422 Study 03-4245.

4.3. JUSTIFICATION FOR TEST ANIMAL SELECTION

The rat is an animal model commonly utilized in toxicity studies as recommended in OECD and EPA guidelines. In addition, a historical database is available for comparative evaluation.

4.4. JUSTIFICATION FOR NUMBER OF ANIMALS

The number of animals in the protocol is considered to be the minimum necessary for scientific and statistical reasons in order to evaluate the data with sufficient confidence levels.

4.5. JUSTIFICATION FOR EXPOSURE LEVEL SELECTION

The exposure levels were selected based on prior results of minimal toxicity up to 10% (100000 ppm). Therefore, the high exposure level was established (for safety reasons) as 50% of the lower explosion limit (2.4% = 24000 ppm) for the test substance.

5. TEST SUBSTANCE

5.1. TEST SUBSTANCE: PROPANE

Test Substance Category: industrial gas

Description, lot number, storage, expiration date (if available) and handling procedures, as well as other pertinent information will be documented in the study data. The Testing Facility will purchase the test substance from a Sponsor approved vendor (MG Industries, Malvern PA). The test substance will be stored (ambient conditions) in an outside solvent shed except when in use in the inhalation laboratory. The test substance will be handled as a flammable gas.

5.2. IDENTIFICATION OF TEST SUBSTANCE

Unless otherwise noted, the identity, strength, purity, composition, stability and method of synthesis, fabrication and/or derivation of each batch of the test substance will be documented by the Supplier before its use in the study. This documentation will be maintained by the Supplier.

The Testing Facility will ensure that the location of the documentation of fabrication is provided in the report. Purity of the test substance will also be determined by the Testing Facility by assaying by GC before the study.

5.3. ARCHIVAL SAMPLES

An archival sample from each lot of test substance will be taken and stored in the Archives of the Sponsor (EPL Archives, Inc., 45610 Terminal Drive, Sterling, VA 20166). If multiple studies are conducted with the same test substance, a common archival sample may be taken and appropriately labeled.

5.4. ADMINISTRATION OF TEST SUBSTANCE

The test substance will be administered by whole-body inhalation exposure. The test substance will be administered as a gas (depending on the physical properties of the test substance) in the breathing air of the animals. The test atmosphere will be generated by an appropriate procedure determined during pre-study trials. The trials will be performed (at least two 6-hour periods) to evaluate the optimal set of conditions and equipment to generate a stable and uniform atmosphere at the target exposure levels. The method will be described in the raw data of the study and in the report.

The whole-body exposure chambers will each have a volume of approximately 1000 liters. Each chamber will be operated at a minimum flow rate of 200 liters per minute. The final airflow will be set to provide at least one air change in 5.0 minutes (12 air changes/hour) and a T_{99} equilibrium time of at most 23 minutes. This chamber size and air flowrate is considered adequate to maintain the animal loading factor below 5% and the oxygen level at 19% or higher. At the end of the exposure, all animals will remain in the chamber for a minimum of 30 minutes. During this time the chamber will be operated at approximately the same flow rate using clean air only.

5.5. EXPOSURE CONCENTRATION DETERMINATION

A nominal exposure concentration will be calculated daily, if possible. The flow of test substance into the chamber and the flow of air through the chamber will be monitored using appropriate calibrated equipment. The average test substance flow during the exposure will be divided by the average chamber airflow to give the nominal concentration.

During each exposure, measurements of airborne concentrations of test substance in the animal's breathing zone will be performed at least four times using an appropriate sampling procedure and infrared spectrophotometric analytical procedure. Also prior to initiation of animal exposures, additional samples will be taken to determine the distribution of the test substance in the exposure chamber.

If more than the normal amount of trial time is required because of test substance generation or monitoring problems (80 technician hours), the Sponsor will be consulted prior to additional trials (additional cost).

5.6. PARTICLE SIZE DISTRIBUTION ANALYSIS

During each exposure, particle size determinations will be performed using a TSI Aerodynamic Particle Sizer to characterize the aerodynamic particle size distribution of any aerosol present.

5.7. CHAMBER AND EXPOSURE ROOM ENVIRONMENT

Chamber temperature, humidity, airflow rate and static pressure will be monitored continuously and recorded every 30 minutes during exposure. Chamber temperature and relative humidity will be maintained, to the maximum extent possible, between 20 to 24°C and 40 to 60%, respectively. Chamber oxygen levels (maintained at least 19%) will be measured pretest and at the beginning, middle and end of the study.

Air samples will be taken in the vapor generation area pretest and at the beginning, middle and end of the study. Light (maintained approximately 30-40 foot-candles at 1.0 meter above the floor) and noise levels (maintained below 85 decibels) in the exposure room will be measured pretest and at the beginning, middle and end of the study.

5.8. SUMMARY OF CHAMBER ACTIVITY

The minimum frequency of chamber activity is summarized below:

Activity	Frequency/chamber
Measured Test Substance Concentration	4X/day
Particle Size	1X/day
Temperature	13X/day
Relative Humidity	13X/day
Airflow Rate & Static Pressure	13X/day
Nominal Test Substance Concentration	1X/day
Rotation Pattern of Exposure Cages	1X/day
Loading/Unloading Verification	1X/day

5.9. FREQUENCY AND DURATION OF ADMINISTRATION

The test substance will be administered for 6 hours per day for 7 consecutive days per week for 2 weeks for a total of at least 14 exposures. Test substance administration will continue through the day prior to necropsy.

5.10. UNUSED TEST SUBSTANCE

The unused portion of the test substance as well as any empty test substance containers will be returned to the Supplier following completion of the in-life phase of the final study with this test substance.

6. TEST ANIMALS

6.1. SPECIES

Albino Rats (Outbred) Vaf/Plus®
Sprague-Dawley - derived (CD®)
Crl: CD (SD) IGS BR

6.2. SUPPLIER

Charles River Laboratories

Documentation of the specific breeding facility will be maintained in the study file.

6.3. ANIMAL REQUIREMENTS/SPECIFICATIONS

6.3.1. NUMBER OF ANIMALS ON STUDY

Total	Males	Females
80	40	40

6.3.2. AGE

Young adult (approximately 6 weeks at receipt; approximately 8 weeks (and no more than 9 weeks) at initiation of exposures.

6.3.3. WEIGHT

Approximately 200 to 300 grams (males) and 150 to 250 grams (females) at first exposure. Animals outside of this range may be used at the discretion of the Study Director.

6.4. ACCLIMATION PERIOD

Approximately 2 weeks; all animals will be checked for viability twice daily. Prior to assignment to study, all animals will be examined to ascertain suitability for study.

6.5. ANIMAL CARE AND HUSBANDRY

6.5.1. FACILITIES MANAGEMENT/ANIMAL HUSBANDRY

Currently acceptable practices of good animal husbandry will be followed, e.g., *Guide for the Care and Use of Laboratory Animals*; National Academy Press, 1996. Huntingdon Life Sciences Inc. is fully accredited by the Association for Assessment and Accreditation of Laboratory Animal Care International (AAALAC).

6.5.2. VETERINARY CARE

Animals will be monitored by the technical staff for any conditions requiring possible veterinary care. If any such conditions are identified, a staff veterinarian will be notified for an examination and evaluation. Animals will be treated as outlined in the Animal Welfare Act Compliance section of this protocol.

6.5.3. ENVIRONMENTAL CONDITIONS

Light/Dark Cycle

Twelve hour light/dark cycle provided via automatic timer.

Temperature

Temperature will be monitored in accordance with Testing Facility SOPs to ensure that the desired range of 18 to 26°C is maintained to the maximum extent possible.

Humidity

Humidity will be monitored in accordance with Testing Facility SOPs to ensure that the desired range of 30 to 70% is maintained to the maximum extent possible.

6.5.4. HOUSING

Animals will be individually housed in suspended, stainless steel wire mesh cages during the study.

6.5.5. FEED

Certified Rodent Diet, No. 5002; (Meal) (PMI Nutrition International, St. Louis, MO) *ad libitum.*

6.5.6. WATER

Elizabethtown Water Company, Westfield, NJ; *ad libitum,* via automated watering system.

6.5.7. FEED ANALYSIS

Analytical certification of batches of feed provided by the manufacturer will be maintained on file at the Testing Facility. There are no known contaminants in the feed which are expected to interfere with the objectives of this study.

6.5.8. WATER ANALYSIS

Water analyses are conducted by Elizabethtown Water Company to assure that water meets standards specified under the EPA Federal Safe Drinking Water Act Regulations (40 CFR Part 141). Water analysis, provided by the supplier, will be maintained on file at the Testing Facility. In addition, chemical and microbiological analyses are conducted biannually on water samples collected from representative rooms in this facility. Results are maintained on file at the Testing Facility. There are

no known contaminants which are expected to interfere with the objectives of this study.

6.5.9. ANIMAL ASSIGNMENT

More animals than required for the study will be purchased and acclimated. Animals considered suitable for study on the basis of pretest physical examinations, body weight data and any other pretest evaluations, will be randomly assigned to control or treated groups in an attempt to equalize mean group body weights. Individual weights of animals placed on test shall be within ±20% of the mean weight for each sex. Disposition of all animals not utilized in the study will be maintained in the study file.

6.5.10. IDENTIFICATION

Each animal will be assigned a temporary identification number upon receipt. After selection for study, each animal will be ear-tagged with a number assigned by the Testing Facility. This number plus the study number will comprise the unique animal number for each animal. If the tag is lost, it will be replaced. Each cage will be provided with a cage card which will be color coded for exposure level identification and will contain the study number and animal number.

6.5.11. ANIMAL HUSBANDRY/EXPOSURE

Housing:	Individually in cages.
Feed:	None.
Water:	None.

7. IN-LIFE EVALUATIONS

7.1. CLINICAL OBSERVATIONS

7.1.1. VIABILITY CHECKS (CAGE-SIDE)

Observations for mortality and general condition will be made at least twice daily (once in the morning and once in the afternoon). Animals in poor health or in a possible moribund condition will be identified for further monitoring and possible euthanasia.

7.1.2. PHYSICAL EXAMINATIONS

In-Chamber: All animals will be observed as a group at least once during each exposure.

Out-of-Chamber: Each animal will be removed from its cage and examined at least once pretest and once per week during the study period. Examinations will include observations of general condition, skin and fur, eyes, nose, oral cavity, abdomen and external genitalia, occurrence of secretions and excretions, and autonomic activity (e.g., lacrimation, piloerection, pupil size, unusual respiratory pattern). Changes in gait, posture and response to handling as well as the presence of clonic or tonic movements, stereotypy (e.g., excessive grooming, repetitive circling) or bizarre behavior (e.g., self-mutilation, walking backward) will be recorded.

7.2. BODY WEIGHTS

Non-fasted body weights for each animal will be recorded at least once pretest, on the first day of exposures and once per week during the study period. Fasted weights will be obtained prior to necropsy.

7.3. FEED CONSUMPTION

Feed consumption will be measured (weighed) during the week prior to treatment initiation and once per week during the study period. Feed will be available without restriction 7 days/week except during exposures. Animals will be presented with weighed feeders at the scheduled intervals. After at least 5 days, the feeders will be reweighed and the resulting weight subtracted from the initial feeder weight to obtain the grams of feed consumed per animal per day. The grams consumed per kilogram of body weight per day will then be calculated for each animal.

8. POSTMORTEM EVALUATIONS

8.1. MACROSCOPIC PATHOLOGY

A complete macroscopic examination will be performed on all animals, including animals euthanized in a moribund condition or found dead; all abnormal observations will be recorded. The necropsy will consist of a careful examination of the external surface of the body, all orifices and the cranial, thoracic and abdominal cavities and their contents. Special attention should be paid to the organs of the reproduction system.

8.1.1. MORIBUND ANIMALS

Animals showing signs of severe debility, particularly if death appears imminent, will be humanely euthanized to prevent loss of tissues through autolysis.

8.1.2. TERMINAL NECROPSY

Necropsy will be performed on 10 animals/sex/group after animals have been treated for at least 14 days. Necropsy schedules will be established in order to assure that approximately equal numbers of males and females from each group will be examined at similar times of the day of necropsy.

8.2. METHOD OF EUTHANASIA

Exsanguination following carbon dioxide inhalation.

8.3. ORGAN WEIGHTS

Organs indicated below will be taken from all survivors at the scheduled necropsies, weighed, recorded and organ/body and organ/brain weight ratios calculated. Organs will not be weighed for animals found dead or euthanized in a moribund condition during the course of the study. Prior to weighing, all organs will be carefully dissected and properly trimmed to remove fat and other contiguous tissues in a uniform manner. Organs will be weighed as soon as possible after dissection to avoid drying. Paired organs will be weighed together.

adrenals	liver	seminal vesicles
brain	lungs	spleen
epididymides	ovaries	testes
heart	pituitary	thymus
kidneys		uterus

8.4. TISSUE PRESERVATION

Tissues listed in Appendix A will be obtained at necropsy and preserved for all animals.

Eyes – glutaraldehyde/paraformaldehyde initially and then 10% neutral buffered formalin

Testes and epididymides – modified Davidson's solution initially and then 10% neutral buffered formalin

All other tissues - 10% neutral buffered formalin

Note: Lungs and urinary bladder will be infused with formalin to ensure fixation.

8.5. MICROSCOPIC PATHOLOGY EVALUATIONS

No examinations are required. Authorization will be obtained from the Sponsor prior to performing any examinations. If tissues are examined, standard stains (hematoxylin and eosin) will be used. Special stains may be employed on selected tissues to aid in making a diagnosis at the discretion of the Study Pathologist. Special stains may also be employed at the request of the Sponsor (additional cost).

9. ARCHIVING OF RECORDS AND SPECIMENS

All data documenting experimental details and study procedures and observations will be recorded and maintained as raw data. At the completion of the study, all reports, raw data, preserved archival specimens and retained samples will be maintained in the Testing Facility's Archives for a period of 1 year after submission of the signed final report.

The Sponsor will be contacted in order to determine the final disposition of these materials. The Sponsor is responsible for all cost associated with the storage of these materials beyond one year from the issuance of the final report and for any costs associated with the shipment of these materials to the Sponsor or to any other facility designated by the Sponsor.

10. STATISTICAL ANALYSIS

10.1. ITEMS TO BE ANALYZED

The following will be compared for control and test substance-treated groups.

mean body weight values
mean feed consumption values
mean terminal organ weights, organ/body and organ/brain weight ratios

10.2. PROCEDURES

Evaluation of equality of group means will be made by the appropriate statistical method, followed by a multiple comparison test if needed. Bartlett's test (Bartlett, 1937; Sokal and Rohlf, 1995) will be performed to determine if groups have equal variances. For all parameters except organ weights, if the variances are equal, parametric procedures will be used; if not, nonparametric procedures will be used. Organ weight data will be analyzed only by parametric methods. The parametric method

will be the standard one-way analysis of variance (ANOVA) using the F ratio to assess significance (Armitage, 1971; Dunlap and Duffy, 1975). If significant differences among the means are indicated, additional tests will be used to determine which means are significantly different from the control: Dunnett's (Dunlap et al., 1981; Dunnett, 1955, 1964), Williams (Williams, 1971, 1972), or Cochran and Cox's modified t-test (Cochran and Cox, 1959). The nonparametric method will be the Kruskal-Wallis test (Kruskal and Wallis, 1952, 1953) and if differences are indicated, Shirley's test (Shirley, 1977), Steel's test (Steel, 1959), or Pairwise Comparison with Bonferroni Correction (Games and Howell, 1976) will be used to determine which means differ from control. Bartlett's test for equality of variance will be conducted at the 1% significance level; all other statistical tests will be conducted at the 5% and 1% significance levels.

References for these procedures are:

Armitage, P. 1971. *Statistical Methods in Medical Research.* Oxford, UK: Blackwell Scientific Publications; Bartlett, M.S. 1937. Properties of sufficiency and statistical tests. *Proceedings of the Royal Society, Series A,* 160: 268-282; Cochran, W.G. and Cox, G.M. 1959. *Experimental Designs,* New York: John Wiley, pp. 100-102; Dunlap, W.P. and Duffy, J.A. 1975. Fortran IV Functions for Calculating Exact Probabilities Associated with Z, Chi-Square, T and F Values. *Behav. Res. Methods and Instrumentations* 7:59-60; Dunlap, W.P., Marx, M.S. and Agamy, G.G. 1981. Fortran IV functions for calculating probabilities associated with Dunnett's test. *Behav. Res. Methods and Instrumentation* 13: 363-366; Dunnett, C.W. 1955. A multiple comparison procedure for comparing several treatments with a control. *Journal of the American Statistical Association* 50: 1096-1121; Dunnett, C.W. 1964. New tables for multiple comparisons with a control. *Biometrics* 20-3: 482-491; Games, P.A. and Howell, J.F. 1976. Pairwise multiple comparison procedures with unequal n's and/or variances: a monte-carlo study. Journal of Educational Statistics 1: 113-125; Kruskal, W.H. and Wallis, W.A. 1952. Use of Ranks in one-criterion variance analysis. Journal of the American Statistical Association 47: 583-621; Kruskal, W.H. and Wallis, W.A. 1953. Errata for Kruskal-Wallis (1952) Journal of the American Statistical Association 48: 907-911; Shirley, E.A.C. 1977. A non-parametric equivalent of Williams' test for contrasting increasing dose levels of a treatment. Biometrics 33: 386-389; Sokal, R.R. and Rohlf, F.J. 1995. Biometry. 3rd Edition. San Francisco: W.H. Freeman pp. 369-371; Steel, R.G.D. 1959. A multiple comparison rank sum test: treatment versus control. *Biometrics* 15: 560-572.; Williams, D.A. 1971.

A test for differences between treatment means when several dose levels are compared with a zero dose control. Biometrics 27: 103-117; Williams, D.A. 1972. The comparison of several dose levels with a zero dose control. Biometrics 28: 519-531.

11. REPORTING

11.1. STATUS REPORTS

Periodic written (weekly) updates on study progress will be provided by the Study Director.

11.2. FINAL REPORT

One unbound hard copy and one electronic copy of an audited draft report will be submitted following termination of the study. After receipt and review of the Sponsor's comments, appropriate changes will be made and two hard copies and one electronic copy of a signed, final report will be issued. (Additional copies will be provided at additional cost). The report will minimally include:

Compliance Statement (including Sponsor signature line)
Quality Assurance Statement
Summary
Introduction
Experimental Design
Materials and Methods
Discussion of Study Results
Conclusion (including NOAEL statement, if applicable)
Tables of Exposure Data
Mortality Data
Individual animal termination history
Summary of daily animal observations (as appropriate)
Individual and summary tables of weekly physical examination data
Tables of mean and individual body weights
Tables of mean and individual feed consumption
Tables of mean and individual organ weights, organ/brain and organ/body weight ratios
Individual and summary tables of macroscopic pathology findings
References for experimental methodology
Senior personnel participating in the study
Copy of study protocol and associated amendments

12. REGULATORY REFERENCES

12.1. TESTING GUIDELINES

This study is not designed to meet regulatory requirements. It is designed to provide preliminary toxicity data for the test substance in order to determine appropriate exposure levels for a subsequent OECD 422 inhalation study 03-4245.

12.2. GOOD LABORATORY PRACTICES

This study will be conducted in compliance with EPA Good Laboratory Practices as set forth in 40 CFR Part 792 (TSCA) and Organization for Economic Cooperation and Development (OECD) Good Laboratory Practices as set forth in ENV/MC/CHEM(98)17.

12.3. ANIMAL WELFARE ACT COMPLIANCE

This study will comply with all appropriate parts of the Animal Welfare Act Regulations: 9 CFR Parts 1 and 2 Final Rules, Federal Register, Volume 54, No. 168, August 31, 1989, pp. 36112-36163 effective October 30, 1989 and 9 CFR Part 3 Animal Welfare Standards; Final Rule, Federal Register, Volume 56, No. 32, February 15, 1991, pp. 6426-6505 effective March 18, 1991. The Sponsor should make particular note of the following:

1. The Sponsor's signature on this protocol documents that, for the study described, there are no generally accepted non-animal alternatives and the study does not unnecessarily duplicate previous experiments in regard to species, test substance, route of administration or duration of treatment.

2. All procedures used in this study have been designed to avoid discomfort, distress and pain to the animals. All methods are described in this study protocol or written laboratory standard operating procedures.

3. Any procedures outlined in this study which cause more than momentary or slight pain or distress to the animals will be performed with appropriate sedatives, analgesics or anesthetics unless the withholding of these agents is justified for scientific reasons, in writing by the Sponsor and the Study Director, in which case the procedure will continue for the minimum time necessary. Documentation of the justification for withholding treatment for pain

or distress and IACUC approval of the procedures will be made prior to study initiation on the IACUC Protocol Review Form.

4. Animals experiencing more than momentary or slight pain or distress due to test substance or injury or illness will be treated by the Testing Facility's veterinary staff with approved analgesics or agents to relieve pain after consultation with the Study Director and Sponsor. However, in emergency situations, the veterinary staff is authorized to administer emergency treatment as necessary. Any subsequent treatment or euthanasia will be administered after consultation with the Study Director. The Sponsor will be advised by the Study Director of all emergency situations in as timely a manner as possible.

5. Methods of euthanasia used during this study are in conformance with the above-referenced regulations.

12.4. INSTITUTIONAL ANIMAL CARE AND USE COMMITTEE (IACUC)

The IACUC Protocol Review Subcommittee has reviewed this protocol and found it to be in compliance with all appropriate regulations.

13. QUALITY ASSURANCE MONITORING

The Huntingdon Life Sciences Quality Assurance Unit will monitor the facilities, equipment, personnel, methods, practices, records and controls used in this study to assure that they are in conformance with this protocol, company SOPs, and the appropriate Good Laboratory Practice requirements.

14. ALTERATION IN STUDY DESIGN

Alterations of this protocol may be made as the study progresses. No changes in the protocol will be made without the consent of the Sponsor. In the event that the Sponsor authorizes a protocol change verbally, such changes will be honored by the Testing Facility and will be followed by a written verification. All protocol modifications will be signed by the Study Director and a Sponsor representative. Any modifications potentially affecting animal welfare will also be signed by 2 members of the Institutional Animal Care and Use Committee prior to the modification's implementation.

APPENDIX A
Tissues Preserved

Tissue	Preserved
adrenal gland	X
aorta (thoracic)	X
bone (sternum/femur)	X
bone marrow (rib) [a]	X
brain (medulla/pons, cerebrum and cerebellum)	X
epididymides	X
esophagus	X
eye (with optic nerve)	X
heart	X
kidneys	X
large intestine (cecum, colon, and rectum)	X
lacrimal gland	X
larynx	X
liver	X
lungs (with mainstem bronchi)	X
lymph nodes (mediastinal and mesenteric)	X
mammary gland	X
muscle (biceps femoris)	X
nasopharyngeal tissue	X
nerve (sciatic)	X
ovaries	X
pancreas	X
pituitary	X
prostate	X

Tissue	Preserved
salivary gland with submandibular lymph node	X
seminal vesicles	X
skin	X
small intestine (duodenum, jejunum, ileum)	X
spinal cord (cervical, thoracic, lumbar)	X
spleen	X
stomach	X
testes	X
thymic region	X
thyroid (with parathyroids)	X
trachea	X
urinary bladder	X
uterus (body/horns with cervix)	X
Zymbal's gland	X
gross lesions and tissue masses	X
target organs[b]	X

[a]Bone marrow smears will be prepared. They will only be evaluated (Sponsor approval, additional cost) if needed.

[b]Target organs will be designated by the Study Director, Pathologist and/or Sponsor based on experimental findings.

Protocol Amendment No. 1

Study Title: Propane: A 2-Week Range-Finding Inhalation Toxicity Study in the Rat via Whole-Body Exposures

Changes

1. Proposed Study Dates, page 1:

Revise: Receipt of Test Animals	29 July 2003 **(Experimental Start)**
First Day of Treatment	14 August 2003 ~~(Experimental Start)~~

2. Identification of Test Substance, page ~~3~~ 8:
Add: ....Purity of the test substance will also be determined by the Testing Facility by assaying by GC before the study. **Stability of the test substance will also be determined by the Testing Facility by assaying by GC after the subsequent OECD 422 study 03-4245.**

3. Animal Requirements/Specifications, page 7:
Add: **Female rats will be nulliparous and non-pregnant.**

4. Statistical Analysis/Procedures, page 12:
Revise: Evaluation of equality of group means will be made by the appropriate statistical method, followed by a multiple comparison test if needed. Bartlett's test (Bartlett, 1937; Sokal and Rohlf, 1995) will be performed to determine if groups have equal variances. For all parameters except organ weights, if the variances are equal, parametric procedures will be used; if not, nonparametric procedures will be used. Organ weight data will be analyzed only by parametric methods. The parametric method will be the standard one-way analysis of variance (ANOVA) using the F ratio to assess significance (~~Armitage, 1971;~~ Dunlap and Duffy, 1975). If significant differences among the means are indicated, additional tests will be used to determine which means are significantly different from the control: Dunnett's (Dunlap et al., 1981; Dunnett, 1955, 1964), ~~Williams (Williams, 1971, 1972),~~ or Cochran and Cox's modified t-test (Cochran and Cox, 1959). The nonparametric method will be the Kruskal-Wallis test (Kruskal and Wallis, 1952, 1953) and if differences are indicated, ~~Shirley's test (Shirley, 1977)~~, ~~Steel's test (Steel, 1959)~~, or Pairwise Comparison with Bonferroni Correction (Games and Howell, 1976) will be used to determine which means differ from control. Bartlett's test for equality of variance will be conducted at the 1% significance level; all other statistical tests will be conducted at the 5% and 1% significance levels.

References for these procedures are:

~~Armitage, P. 1971. Statistical Methods in Medical Research. Oxford, UK: Blackwell Scientific Publications;~~ Bartlett, M.S. 1937. Properties of sufficiency and statistical tests.

Protocol Amendment No. 1

Proceedings of the Royal Society, Series A, 160: 268-282; Cochran, W.G. and Cox, G.M. 1959. *Experimental Designs*, New York: John Wiley, pp. 100-102; Dunlap, W.P. and Duffy, J.A. 1975. Fortran IV Functions for Calculating Exact Probabilities Associated with Z, Chi-Square, T and F Values. *Behav. Res. Methods and Instrumentations* 7:59-60; Dunlap, W.P., Marx, M.S. and Agamy, G.G. 1981. Fortran IV functions for calculating probabilities associated with Dunnett's test. *Behav. Res. Methods and Instrumentation* 13: 363-366; Dunnett, C.W. 1955. A multiple comparison procedure for comparing several treatments with a control. *Journal of the American Statistical Association* 50: 1096-1121; Dunnett, C.W. 1964. New tables for multiple comparisons with a control. *Biometrics* 20-3: 482-491; Games, P.A. and Howell, J.F. 1976. Pairwise multiple comparison procedures with unequal n's and/or variances: a monte-carlo study. Journal of Educational Statistics 1: 113-125; Kruskal, W.H. and Wallis, W.A. 1952. Use of Ranks in one-criterion variance analysis. Journal of the American Statistical Association 47: 583-621; Kruskal, W.H. and Wallis, W.A. 1953. Errata for Kruskal-Wallis (1952) Journal of the American Statistical Association 48: 907-911; ~~Shirley, E.A.C. 1977. A non parametric equivalent of Williams' test for contrasting increasing dose levels of a treatment. Biometrics 33: 386-389;~~ Sokal, R.R. and Rohlf, F.J. 1995. Biometry. 3rd Edition. San Francisco: W.H. Freeman pp. 369-371; ~~Steel, R.G.D. 1959. A multiple comparison rank sum test: treatment versus control. Biometrics 15: 560-572.; Williams, D.A. 1971. A test for differences between treatment means when several dose levels are compared with a zero dose control. Biometrics 27: 103-117; Williams, D.A. 1972. The comparison of several dose levels with a zero dose control. Biometrics 28: 519-531.~~

Reasons for Changes

1. Correction of the Experimental Start Date as per OECD GLP's.
2. Clarification of how the stability of the test substance will be documented.
3. Oversight in original protocol.
4. Removal of statistical procedures and references not relevant to this study.

Amendment approved by:

[redacted]

28 Oct 03
Date

[redacted]

10/28/03
Date

	Analytical Report	Appendix N

STUDY TITLE

Analytical Report For:

Propane:
A "2-Week" Range-Finding Inhalation Toxicity Study
in the Rat via Whole-Body Exposures

AUTHOR

[redacted]

REPORT DATE

9 April 2010

STUDY NUMBER

03-6146

SIGNATURES

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Formulation Chemistry Services
07 Apr 10
Date

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07 Apr 10
Date

	Analytical Report	Appendix N

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1. Summary

The test substance and the analytical standard (Propane) were analyzed ("pre-study") to determine the purity of the test substance by comparison to the analytical standard. The analytical method was validated at Huntingdon Life Sciences (HLS). The analytical method involved gas bag sampling of the test substance and the analytical standard and quantification using Gas Chromatography with Flame Ionization Detection (FID).

2. Experimental Procedures

The analytical method (HLS-011-03) was validated by Formulation Chemistry at HLS. Details of the analytical method and the validation are maintained in this study file.

Gas bag sampling of the test substance and the analytical standard was performed in the Inhalation Department at HLS. The test substance and the analytical standard were analyzed using a Gas Chromatograph equipped with a HP Plot Q (30 m x 0.32 mm, 20 µm) column and Flame Ionization Detector (FID) to determine the purity of Propane test substance. HP 3396A integrator was used for data collection and Excel was used for processing the data.

Date of sample analysis is listed as follows:

Interval	Date Analyzed
"Pre-Study" Characterization	29 May 03

3. Results and Discussion

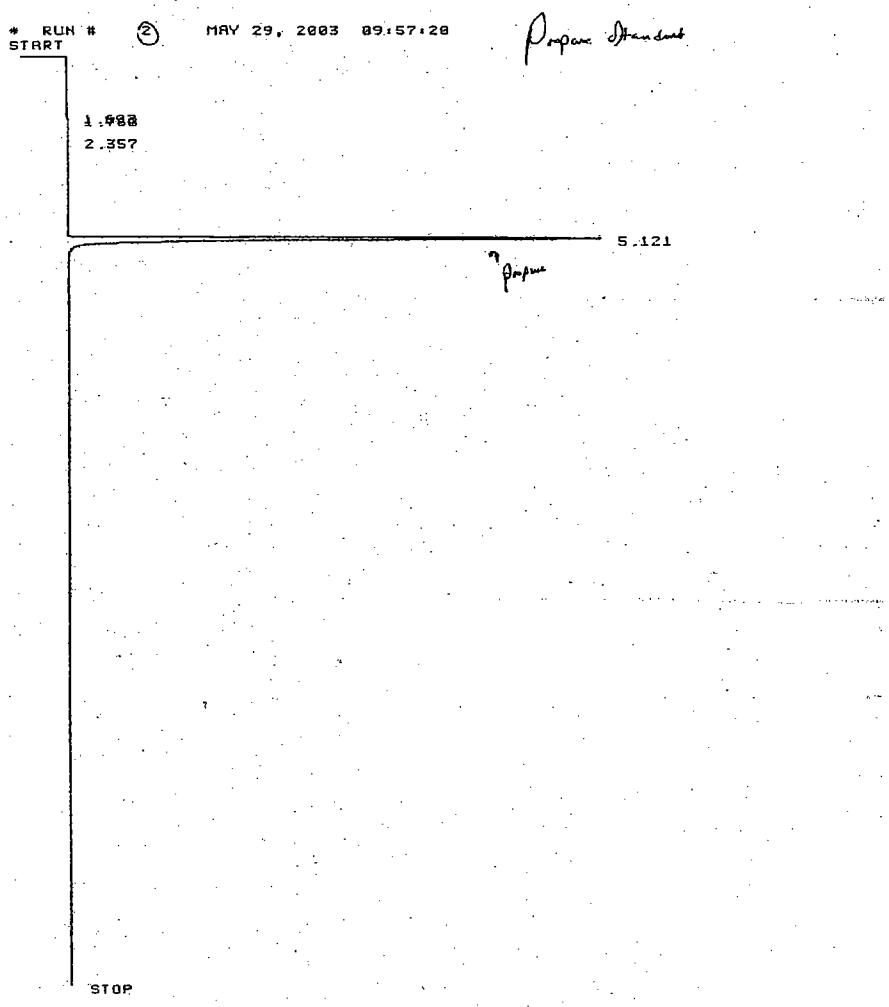
The test substance and analytical standard (Propane) were analyzed prior to the initiation of the study to determine the purity of the test substance. The results of the characterization are presented in Table I. A typical chromatogram of Propane standard is presented in Figure I. A typical chromatogram of Propane test substance is presented in Figure II.

Table I: Propane Characterization ("Pre-Study")

Sample ID	Area % of Ethane	Area % of Isobutane	Area % of Butane	Area % of other Impurities	Area % of Propane Standard	Mean Area % of Propane Standard
Propane Standard	0.08	0.00	0.00	0.09	99.83	99.84
Propane Standard	0.08	0.00	0.00	0.10	99.82	
Propane Standard	0.08	0.00	0.00	0.05	99.87	

Sample ID	Area % of Ethane	Area % of Isobutane	Area % of Butane	Area % Other Impurities	Area % of Propane Substance	Mean Area % of Propane Test Substance
Propane Test Substance	0.00	0.00	0.00	0.12	99.88	99.91
Propane Test Substance	0.00	0.00	0.00	0.08	99.92	
Propane Test Substance	0.00	0.00	0.00	0.08	99.92	

Figure I. A Typical Gas Chromatogram of Propane Analytical Standard



RUN# 2 MAY 29, 2003 09:57:20

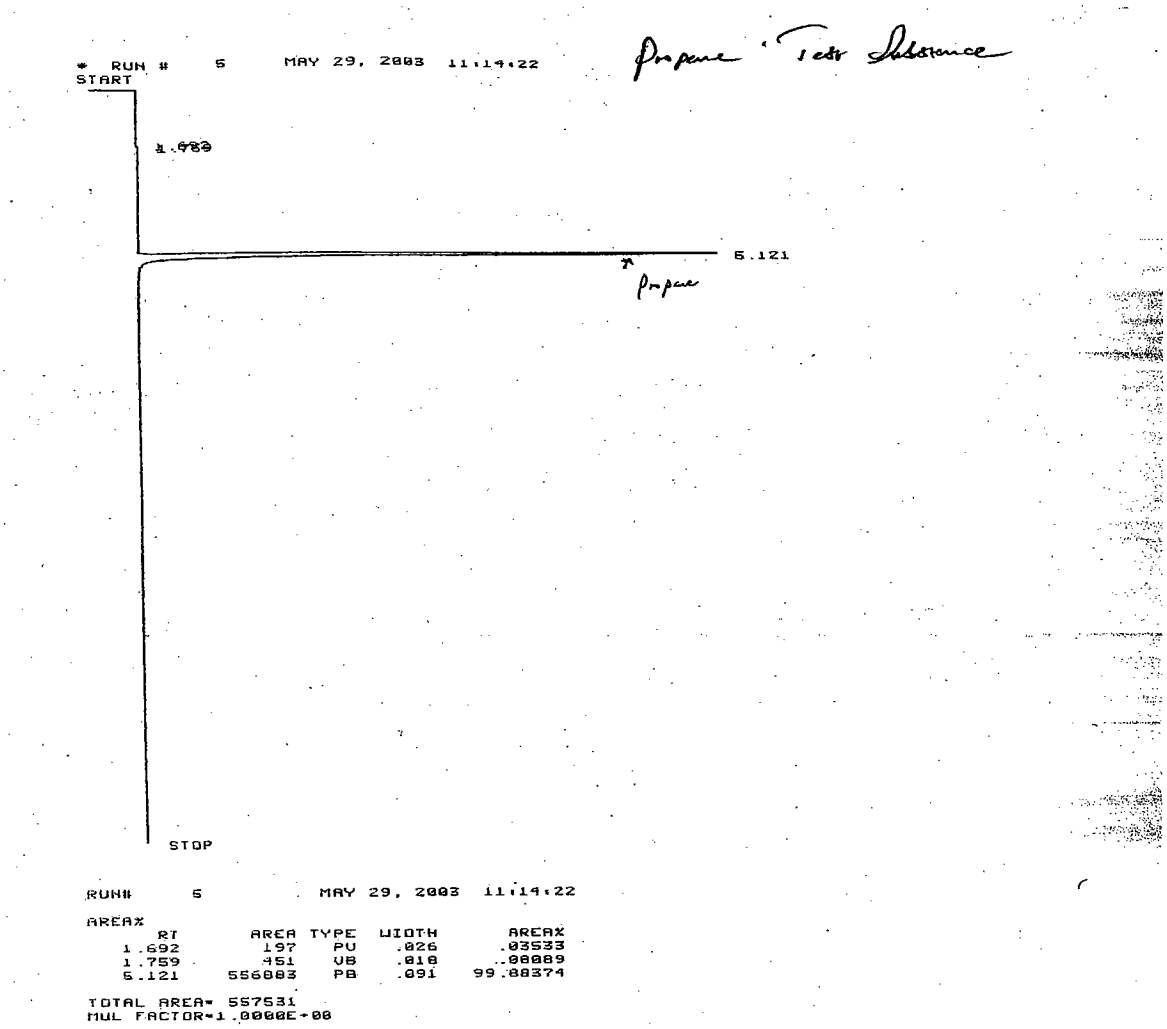
AREA%

RT	AREA	TYPE	WIDTH	AREA%
1.693	219	BV	.027	.04038
1.760	325	VV	.019	.05992
2.357	410	BB	.020	.07559
5.121	541424	PB	.091	99.82410

TOTAL AREA= 542378

Response (mV) vs Time (minutes)

Figure II. A Typical Gas Chromatogram of Propane Test Substance



Response (mV) vs Time (minutes)

	Testing Facility Personnel	Appendix O

TITLE/DEPARTMENT	NAME/DEGREE
SENIOR VICE PRESIDENT, SAFETY ASSESSMENT	[redacted]
DIRECTOR OF REPRODUCTIVE TOXICOLOGY	[redacted]
DIRECTOR, ANALYTICAL SERVICES	[redacted]
DIRECTOR, TOXICOLOGY OPERATIONS	[redacted]
DIRECTOR, QUALITY ASSURANCE	[redacted]
STUDY DIRECTOR	[redacted]
STUDY MONITOR	[redacted]
VETERINARIAN	[redacted]
MANAGER/SUPERVISOR Inhalation Toxicology Pharmacy Analytical Services Necropsy	[redacted]

	Report Amendments	Appendix P

There are no amendments for this report at this time.

Appendix MM

PROTOCOL

PROPANE

COMBINED REPEATED-EXPOSURE TOXICITY, REPRODUCTION AND NEUROTOXICITY SCREENING IN RATS VIA WHOLE-BODY INHALATION EXPOSURES

CONFIDENTIAL

HLS Study No.:	**03-4245**
Protocol No.:	**Final**
Date:	**10 December 2003**

PROTOCOL PREFACE

(Confidential Information - to be distributed on a need-to-know basis)

Study Title: Propane: Combined Repeated-Exposure Toxicity, Reproduction and Neurotoxicity Screening in Rats via Whole-Body Inhalation Exposures

HLS Study No.: 03-4245

This is the Final Protocol. It has been reviewed and approved by:

[redacted] 15 Dec 03
Date

Huntingdon Life Sciences (HLS)
Address: 100 Mettlers Road
East Millstone, NJ 08875-2360
Phone No.: 732-873-2550 x2920
Fax No.: 732-873-3992
Email: [redacted]

[redacted] 12/14/03
Date

American Petroleum Institute (API)
Address: 1220 L Street, Northwest
Washington, D.C. 20005-4070
Phone No.: 202-682-8480
Fax No.: 202-682-8270
Email: [redacted]

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1. INTRODUCTION

HLS Study No.	03-4245
Title	Propane: Combined Repeated-Exposure Toxicity, Reproduction and Neurotoxicity Screening in Rats via Whole-Body Inhalation Exposures
Testing Facility	Huntingdon Life Sciences 100 Mettlers Road East Millstone, NJ 08875-2360
Purpose	This study is designed to assess the potential toxicity, including neurotoxicity, and reproductive performance in male and female rats when the test substance is administered by whole-body inhalation exposure. For male and female rats, it should permit detection of effects on gonadal function which may not be detected by histological examination of the reproductive organs and on mating behavior. In addition, for female rats this study should detect effects on conception, development of the conceptus and parturition and pup survival to Lactation Day 4.

2. STUDY PERSONNEL

Study Director	[redacted]
Alternate Contact	[redacted]
Director of Reproductive Toxicology	[redacted]

Additional personnel will be documented in the project file and presented in the final report.

3. PROPOSED STUDY DATES

Study Initiation Date	Date Study Director Signs Protocol
Receipt of Test Animals	6 January 2004 (Experimental Start)*
Initiation of Exposures	19 January 2004 (Experimental Start)**
Initiation of Mating	2 February 2004
Termination of Mating	16 February 2004
Termination of Exposures	Main Study Rats: 17 February 2004 Satellite Female Rats: 6 March 2004
Necropsy:	Main Study Rats: 17-18 February 2004 Satellite Female Rats: 28 February–13 March 2004
Submission of Draft Final Report:	15 July 2004
Experimental Termination:	Date of last data collection
Study Completion Date:	Date final report is signed by Study Director

*as per OECD GLP's
**as per EPA GLP's

4. EXPERIMENTAL DESIGN

Group	Group Designation	Exposure Levels (ppm)	Treatment Schedule Pre-mating Period		Number of Animals	
			Main Study Male Rats[b]	Main Study and Satellite Female Rats[b,c]	Main Study Male Rats	Main Study and Satellite Female Rats*
1	Air Control[a]	0	2 weeks	2 weeks	12	24
2	Low	1200	2 weeks	2 weeks	12	24
3	Mid	4000	2 weeks	2 weeks	12	24
4	High	12000	2 weeks	2 weeks	12	24

*12/group = main study animals for subchronic evaluations only

*12/group = satellite animals for reproductive evaluations only

[a] Control animals will be treated with air only with the same treatment regimen as the treated groups.

[b] Main Study male rats (12/group) will be exposed once daily (6 hours/day), seven days/week for 2 weeks prior to mating initiation. Exposure of Main Study male rats will continue during the mating and post-mating periods for a minimum exposure of 28 days. Main Study female rats (12/group) will be exposed once daily (6 hours/day), seven days/week for 4 weeks for a minimum exposure of 28 days.

[c] Satellite female rats (12/group) for the reproduction study will be exposed once daily (6 hours/day), seven days/week for at least two weeks prior to mating initiation. Satellite female rats will continue to be treated once daily (6 hours/day) during mating. Once mated, Satellite female rats will be treated once daily (6 hours/day) during gestation (days 0-19). Satellite female rats without evidence of mating will continue to be treated for 19 days (6 hours/day) following completion of the mating period and then held for an additional 7 days. In the event that Satellite female rats without evidence of mating appear pregnant, exposure will be terminated on the estimated Gestation Day 19.

The first day of exposures will be defined as Day 0 of the study.

4.1. JUSTIFICATION FOR ROUTE, DURATION AND FREQUENCY

The inhalation route is one of the potential routes of human exposure to this test substance and is the route specified in the referenced guidelines. The duration of the study and frequency of exposures are as recommended in the referenced guidelines.

4.2. JUSTIFICATION FOR TEST SYSTEM SELECTION

The rat is a rodent animal model acceptable under OECD and EPA testing guidelines for reproductive toxicity and neurotoxicity studies. In addition, a historical database is available in the Testing Facility for comparative evaluation with this strain of rat.

4.3. JUSTIFICATION FOR NUMBER OF ANIMALS

The number of animals in this study is considered the minimum necessary to allow for meaningful interpretation of the data, as required by OECD and EPA guidelines. Ten pregnancies per group are considered an adequate number for screening for developmental toxicities. The reference guideline indicates 8-10 litters per group provide the necessary degree of consistency between studies. With the group size of 12 used in this study, and with recent pregnancy rates of 80-90%, this should provide between 8-10 litters/group for evaluation. On this basis, group sizes of 12 paired Main Study male and Satellite female rats are considered appropriate for this study and will provide a sufficient number of litters in each group to meet guideline requirements. Group sizes of 12 Main Study female rats are considered appropriate for providing comparable data to the Main Study male rats.

4.4. JUSTIFICATION FOR EXPOSURE LEVEL SELECTION

The exposure levels are based on results of a 2-week range-finding Study 03-6146 which showed no toxicity at exposure levels of 120, 1200 and 12000 ppm. Therefore, the high exposure level was established (for safety reasons) at 12000 ppm since it is 50% of the lower explosion limit (2.4% = 24000 ppm) for the test substance.

5. TEST SUBSTANCE

5.1. TEST SUBSTANCE PROPANE

Test Substance Category: industrial gas

Description, lot number, storage, expiration date (if available) and handling procedures, as well as other pertinent information will be documented in the study data. The Testing Facility will purchase the test substance from a Sponsor approved vendor (MG Industries, Malvern PA). The test substance will be stored (ambient conditions) in an outside solvent shed except when in use in the inhalation laboratory. The test substance will be handled as a flammable gas.

5.1.1. Purity	To be determined by the Testing Facility by assaying by GC before the study.
5.1.2. Stability	To be determined by the Testing Facility by assaying by GC before and after the study.

5.2. IDENTIFICATION OF TEST SUBSTANCE

Unless otherwise noted, the identity, strength, purity, composition, stability, and method of synthesis, fabrication and/or derivation of each batch of the test substance will be documented by the Supplier. This documentation will be maintained by the Supplier. The Testing Facility will ensure that the location of the documentation of fabrication is provided in the report.

5.3. ARCHIVAL SAMPLES

An archival sample from each lot of test substance will be taken and stored in the Archives of the Sponsor (EPL Archives, Inc., 45610 Terminal Drive, Sterling, VA 20166). If multiple studies are conducted with the same test substance, a common archival sample may be taken and appropriately labeled.

5.4. UNUSED TEST SUBSTANCE

The unused portion of the test substance as well as any empty test substance containers will be returned to the Supplier following submission of the final report of the final study with this test substance.

6. TEST ANIMALS

6.1. SPECIES

Albino Rats (Outbred) Vaf/Plus®
Sprague-Dawley - derived (CD®)
Crl: CD (SD) IGS BR

6.2. SUPPLIER

Charles River Laboratories
Raleigh, North Carolina
Note: males and females will be supplied from separate colony rooms

6.3. ANIMAL REQUIREMENTS/SPECIFICATIONS

6.3.1. Number

Male Rats	Female Rats	Total
48	96	144

6.3.2. Age and Weight

Animals will be ordered with body weight stipulations to allow all rats of the same sex to be within ± 20% of the mean weight at the time of randomization.

Male rats will be approximately six weeks at receipt and approximately 8 weeks (200-300 grams) at initiation of treatment. Animals outside this weight range will be used at the discretion of the Study Director.

Female rats will be approximately six weeks at receipt and approximately 8 weeks (150-250 grams) at initiation of treatment. Female rats will be nulliparous and non-pregnant. Animals outside this weight range will be used at the discretion of the Study Director.

6.4. ANIMAL HUSBANDRY

6.4.1. Facilities Management/Animal Husbandry

Currently acceptable practices of good animal husbandry will be followed, e.g., Guide for the Care and Use of Laboratory Animals; National Academy Press 1996. Huntingdon Life Sciences is fully accredited by the Association for Assessment and Accreditation of Laboratory Animal Care International (AAALAC).

6.4.2. Veterinary Care

Animals are monitored by the technical staff for any conditions requiring possible veterinary care. If any such conditions are identified, a staff veterinarian will be notified for an examination and evaluation. Animals will be treated as outlined in the Animal Welfare Act Compliance section of this protocol.

6.4.3. Housing

All animals will be housed individually in stainless steel suspended cages with wire mesh floors and fronts except for the mating period when one Main Study male and one Satellite female rat will

be housed together. During cohabitation (when Satellite female rats will be brought to the Main Study male rat's cages), male and female rats will then be housed in stainless steel cages of appropriate size for group housing animals. Each cage will be fitted to secure a glass feeder jar with a stainless steel lid. Clean feeder jars and fresh feed will be provided at least weekly. From Day 18 of gestation and during lactation, the dam will be housed with her litter in plastic "shoebox" cages with bedding. Clean feed jars and fresh feed will be provided at least weekly for periods when feed consumption is not being recorded and at each interval when feed consumption will be recorded.

6.4.4. Feed and Feed Analysis

Certified Rodent Diet, No. 5002; (Meal) supplied by PMI Nutrition International (St. Louis, MO) and provided *ad libitum.*

Analytical certification of batches of feed provided by the manufacturer will be maintained on file at the Testing Facility. There are no known contaminants in the feed which are expected to interfere with the objectives of this study.

6.4.5. Water and Water Analysis

Facility water is supplied by Elizabethtown Water Company (Westfield, NJ) and will be provided *ad libitum* to individual animal cages via an automated watering system.

Water analyses are conducted by Elizabethtown Water Company to assure that water meets standards specified under the EPA Federal Safe Drinking Water Act Regulations (40 CFR Part 141). Water analysis, provided by the supplier, will be maintained on file at the Testing Facility. In addition, chemical and microbiological analyses are conducted biannually on water samples collected from representative rooms in this facility. Results are maintained on file at the Testing Facility. There are no known contaminants which are expected to interfere with the objectives of this study.

6.4.6. Bedding and Bedding Analysis

Ground corncob bedding (Bed-O'-Cobs® 1/4 inch Irradiated, The Andersons, Maumee, Ohio) will be provided for each mated female rat on Gestation Day 18. Fresh bedding will be provided weekly or as needed throughout lactation. Analyses for each batch of bedding used on study provided by the supplier, will be maintained on file at the Testing Facility. There are no known

contaminants in the bedding that are expected to interfere with the results of this study.

6.4.7. Environmental Conditions

Light/Dark Cycle

Twelve hour light/dark cycle provided via automatic timer.

Temperature

Temperature will be monitored in accordance with Testing Facility SOPs to ensure that the desired range of 18 to 26°C is maintained to the maximum extent possible.

Humidity

Humidity will be monitored in accordance with Testing Facility SOPs to ensure that the desired range of 30 to 70% is maintained to the maximum extent possible.

6.5. ACCLIMATION PERIOD

Approximately 2 weeks; all animals will be checked for viability twice daily. Prior to assignment to study, all animals will be examined to ascertain suitability for study.

6.6. ANIMAL ASSIGNMENT

More animals than required for the study will be purchased and acclimated. Animals considered suitable for study on the basis of pretest physical examinations, body weight data and any other pretest evaluations, will be randomly assigned to control or treated groups in an attempt to equalize mean group body weights. Female animals will be randomly assigned to Main Study or Satellite groups. Individual weights of animals placed on test shall be within ±20% of the mean weight for each sex. Disposition of all animals not utilized in the study will be maintained in the study file.

6.7. ANIMAL IDENTIFICATION

Each animal will be assigned a temporary identification number upon receipt. After selection for study, each animal will be ear-tagged with a number assigned by the Testing Facility. This number plus the study number will comprise the unique animal number for each animal. If the tag is lost, it will be replaced or the animal will be tattooed for identification. Each cage will be provided with a cage card which will be color coded for exposure level identification and will contain the study number and animal number.

6.8. MATING PROCEDURE

Within each treatment group, the Main Study male and Satellite female rats will be co-housed (1:1) until evidence of mating is seen or for 2 consecutive weeks. During mating, cohabitation of male and female littermates will be prohibited. Satellite female rats will be observed at approximately the same time each morning for the presence of a vaginal plug or sperm in the vaginal smear. If not mated, the stage of estrous will instead be recorded. The day on which evidence of mating is observed will be defined as day 0 of gestation. Once mated, the Satellite female rat will be removed from the mating unit and housed individually for the remainder of the study. After the mating period is over, Satellite female rats without evidence of copulation will be removed from the mating unit and housed individually for the remainder of the study (26 days) and monitored for visible signs of pregnancy with corresponding body weight gain.

6.9. ANIMAL HUSBANDRY DURING EXPOSURE

Housing - individually in suspended stainless steel cages
Feed – none
Water - none

7. TEST SUBSTANCE ADMINISTRATION

7.1. ROUTE OF ADMINISTRATION

Inhalation via whole-body exposure.

7.2. JUSTIFICATION FOR ROUTE OF ADMINISTRATION

The inhalation route is one of the potential routes of human exposure to this test substance.

7.3. DURATION AND FREQUENCY OF ADMINISTRATION

Main Study male rats will be exposed once daily, seven days/week for 2 weeks prior to mating initiation. Exposure of Main Study male rats (12/group) will continue during the mating and post-mating periods for a minimum exposure of 28 days. Main Study female rats (12/group) will be exposed once daily, seven days/week for 4 weeks for a minimum exposure of 28 days. Satellite female rats (12/group) for the reproduction study will be exposed once daily, seven days/week for at least two weeks prior to mating initiation. Satellite female rats will continue to be treated once daily during mating. Once mated, Satellite female rats will be treated once daily during gestation (days 0-19). Satellite female rats without evidence

of mating will continue to be treated for 19 days following completion of the mating period and then held for an additional 7 days. In the event that Satellite female rats without evidence of mating appear pregnant, exposure will be terminated on the estimated Gestation Day 19.

7.4. ADMINISTRATION OF TEST SUBSTANCE

The test substance will be administered as a gas in the breathing air of the animals. The test atmosphere will be generated by an appropriate procedure determined during pre-study trials. The trials will be performed (at least two 6-hour periods) to evaluate the optimal set of conditions and equipment to generate a stable and uniform atmosphere at the target exposure level(s). The method will be described in the raw data of the study and in the report.

The whole-body exposure chambers will each have a volume of approximately 1000 liters. The chambers will be operated at a minimum flow rate of 200 liters per minute. The final airflow will be set to provide at least one air change in 5.0 minutes (12 air changes/hour) and a T_{99} equilibrium time of at most 23 minutes. This chamber size and air flowrate is considered adequate to maintain the animal loading factor below 5% and the oxygen level at 19% or higher. At the end of the 6-hour exposure, all animals will remain in the chambers for a minimum of 30 minutes. During this time, the chambers will be operated at approximately the same flow rate using clean air only.

7.5. EXPOSURE CONCENTRATION ADMINISTRATION

A nominal exposure concentration will be calculated daily, if possible. The flow of test substance into the chamber and the flow of air through the chamber will be monitored using appropriate calibrated equipment. The average test substance flow during each exposure will be divided by the average chamber airflow to give the nominal concentration. Also, the additive nominal concentration for all 3 test substance chambers for each exposure day will be measured by weighing the test substance cylinder before and after the exposure and dividing the difference by the average chamber airflow.

During each exposure, measurements of airborne concentrations of test substance in the animal's breathing zone will be performed at least four times using an appropriate sampling procedure and infrared spectrophotometric analytical procedure. If more than the normal amount of trials is required because of test substance generation or monitoring problems (50 technician hours), the Sponsor will be consulted prior to additional trials (additional cost).

7.6. PARTICLE SIZE DISTRIBUTION ANALYSIS

During each week of exposure, particle size determinations will be performed using a TSI Aerodynamic Particle Sizer to characterize the aerodynamic particle size distribution of any aerosol present.

7.7. CHAMBER AND EXPOSURE ROOM ENVIRONMENT

Chamber temperature, humidity, airflow rate and static pressure will be monitored continuously and recorded every 30 minutes during exposure. Chamber temperature and relative humidity will be maintained, to the maximum extent possible, between 20 to 24°C and 40 to 60%, respectively. Chamber oxygen levels (maintained at least 19%) will be measured pretest and at the beginning, middle and end of the study.

Air samples will be taken in the vapor generation area pretest and at the beginning, middle and end of the study. Light (maintained approximately 30-40 foot-candles at 1.0 meter above the floor) and noise levels (maintained below 85 decibels) in the exposure room will be measured pretest and at the beginning, middle and end of the study.

7.8. SUMMARY OF CHAMBER ACTIVITY

The minimum frequency of chamber activity is summarized below:

Activity	Frequency/chamber
Measured Test Substance Concentration	4X/day
Particle Size	1X/week
Temperature	13X/day
Relative Humidity	13X/day
Airflow Rate	13X/day
Nominal Test Substance Concentration (excluding the air control chamber)	1X/day
Rotation Pattern of Exposure Cages	1X/day
Loading/Unloading Verification	1X/day

8. EXPERIMENTAL EVALUATION

8.1. OBSERVATIONS

8.1.1. Viability Checks (Cageside)

Observations for mortality and general condition will be made at least twice daily (once in the morning and once in the afternoon). Animals in poor health or in a possible moribund condition will be identified for further monitoring and possible euthanasia.

8.1.2. Detailed Physical Observations

All animals will be observed as a group at least once during each exposure. This will routinely be performed near the middle of each exposure and may be performed more frequently if significant signs of toxicity are noted.

Each animal will be removed from its cage and a detailed physical observation performed prior to randomization. Main Study male rats will have a detailed physical observation performed once weekly beginning during the premating period and continuing through euthanasia. Main Study female rats will have a detailed physical observation performed once weekly beginning after randomization and continuing through euthanasia. Satellite female rats will have a detailed physical observation performed weekly during the premating period and on Gestation Days 0, 7, 14, 20 and Lactation Days 0, 1 and 4. Satellite female rats without evidence of mating will continue to be observed weekly during the mating and post-mating period until euthanized.

Examinations during non-exposure periods will include observations of general condition, skin and fur, eyes, nose, oral cavity, abdomen and external genitalia, occurrence of secretions and excretions, and autonomic activity (e.g., lacrimation, piloerection, pupil size, unusual respiratory pattern). Changes in gait, posture and response to handling as well as the presence of clonic or tonic movements, stereotypy (e.g., excessive grooming, repetitive circling) or bizarre behavior (e.g., self-mutilation, walking backward) will be recorded.

8.2. BODY WEIGHTS

Body weights of the Main Study male rats and the Main Study female rats will be recorded at the time of randomization into test groups, on the day treatment is initiated and weekly thereafter throughout the study until euthanized. Satellite female rats for the reproduction study will be weighed at the time of randomization into test groups, on the day treatment is initiated and twice weekly until evidence of copulation is observed. Mated Satellite female rats will be weighed on Gestation Days 0, 7, 14 and 20 and Satellite female rats that deliver litters will be weighed on Lactation Days 1 and 4. Satellite female rats without evidence of mating will continue to be weighed twice weekly during the mating and post-mating period until euthanized. A terminal body weight will also be recorded for each animal.

8.3. FEED CONSUMPTION

Feed consumption for the Main Study male rats will be recorded pretest and weekly during the pre-mating treatment period. Feed consumption for the Main Study female rats will be recorded pretest and weekly during the treatment period. Feed consumption for Satellite female rats will be recorded pretest and weekly during the pre-mating treatment period and, if not mated, during the post-mating period. Feed consumption will not be recorded during the mating period when Main Study male rats are being co-housed with Satellite female rats. For pregnant or confirmed mated Satellite female rats, feed consumption will be recorded on Gestation Days 0-7, 7-14, and 14-20 and on Lactation Days 1-4.

8.4. PARTURITION AND LACTATION

On Day 18 of Gestation, several days prior to expected parturition, Satellite female rats will be transferred to solid, plastic cages with bedding article provided. Thereafter, examination for signs of parturition will be made twice daily (morning and afternoon). The duration of gestation will be documented. Evidence of difficult or prolonged parturition or bizarre behavior (including but not limited to self-mutilation, walking backwards), if observed, will be recorded. The day on which parturition initiates will be defined as Lactation Day 0. Litters will be observed as soon as possible after parturition completion for the number of live and dead pups, pup abnormalities and each pup will be sexed. Thereafter, litters will be observed twice daily (morning and afternoon). All pups in the litter will be uniquely identified by toe tattoo after parturition completion. The presence of dead pups will be recorded, and these will be removed from the litter as found. Unusual observations and the absence of milk in the stomach will be noted.

8.5. F_1 PUP EVALUATIONS

8.5.1. Pup Physical Examinations

Each pup will be given a gross physical examination on Lactation Days 0 and 4. Pups will also be observed for any abnormal behavior.

8.5.2. Body Weights and Sexing Data

Individual pup body weights data will be recorded on Lactation Days 1 and 4. Pups will be sexed on Lactation Day 0 and sex verified on Lactation Day 4.

8.6. NEUROBEHAVIORAL EXAMINATIONS

Observations, as outlined below, on all Main Study male rats and all Main Study female rats from all exposure groups will be recorded. Observations will be assessed during the last week of exposure to the test substance. The functional observational battery and motor activity assessments will be performed for all animals on a non-exposure day. Testing will be staggered over several sessions. Each session will consist of approximately equal numbers of animals per sex per exposure level. Noise level will be maintained within a level of 55 to 65 decibels by a white noise generator. Temperature, humidity, and illumination will be measured and recorded to ensure that variations in environmental conditions are minimal during all evaluations. The functional observational battery will be performed for all animals before evaluation of motor activity.

FUNCTIONAL OBSERVATIONAL BATTERY

The time of testing will be balanced across treatment groups. All observations during the treatment period will be performed blind, i.e., the observer will be unaware of the animals' treatment.

Sensory Observations
- startle response to auditory stimuli
- tail pinch response

Neuromuscular Observations
- grip strength – hindlimb and forelimb

Physiological Observations
- rectal temperature

MOTOR ACTIVITY

Activity will be monitored using an automated Photobeam Activity System (San Diego Instruments, Inc.) Sessions will be 60 minutes in length; each session will be divided into 12 five-minute intervals. The time of testing will be balanced across treatment groups. Positive historical control data demonstrating the sensitivity of the procedure will be documented in the final report.

8.7. CLINICAL PATHOLOGY

Clinical pathology procedures and parameters are based on those recommended in guidelines published by the Joint Scientific Committee for International Harmonization of Clinical Pathology Testing in "Harmonization of Animal Clinical Pathology Testing in Toxicity and Safety Studies", *Fund. Appl. Tox.*: 29, 198-201 (1996).

Blood samples for hematology, coagulation and clinical chemistry studies will be obtained from lightly anesthetized (CO_2/O_2) Main Study animals via puncture of the orbital sinus (retrobulbar). Animals will be fasted overnight prior to clinical chemistry blood collection. Blood will be collected and studies performed as follows:

8.7.1. HEMATOLOGY

Blood for hematology studies (~ 0.25 mL) will be collected into tubes containing EDTA anticoagulant.

Number of Animals/Intervals 12/sex/group at termination

Parameters Evaluated

erythrocyte count
hematocrit
hemoglobin
mean corpuscular volume
mean corpuscular hemoglobin
mean corpuscular hemoglobin concentration
leukocyte count (total and differential)
platelet count
reticulocyte count
erythrocyte morphology (from peripheral blood smear)
platelet morphology (from peripheral blood smear)

To be evaluated only if deemed necessary by the Study Director, based on results of other hematology and/or pathology results (additional cost):

bone marrow differential count

8.7.2. COAGULATION

Blood for coagulation studies (~ 0.75 mL) will be collected into tubes containing sodium citrate anticoagulant.

Number of Animals/Intervals 12/sex/group at termination

Parameters Evaluated

prothrombin time
activated partial thromboplastin time

8.7.3. CLINICAL CHEMISTRY

Blood for clinical chemistry studies (~ 1.0 mL) will be collected into tubes with no anticoagulant, allowed to clot, and centrifuged to obtain serum. If an adequate volume of serum is not available for all assays, they will be performed in the order listed.

Number of Animals/Intervals 12/sex/group at termination

Parameters Evaluated

alanine aminotransferase
aspartate aminotransferase
alkaline phosphatase
gamma glutamyl transpeptidase
urea nitrogen
creatinine
glucose
total cholesterol
triglycerides
total protein
albumin
globulin (calculated as total protein - albumin = globulin)
albumin/globulin ratio (calculated)
bilirubin (total)
sodium
potassium
chloride
calcium
phosphorus

8.7.4. RETENTION/STORAGE OF SPECIMENS

Any remaining (frozen) serum, which may have limited storage stability, will be stored for up to 6 months after completion of assays and will then be discarded. Peripheral blood smears will be retained and archived with the study.

9. POSTMORTEM

9.1. METHOD OF EUTHANASIA

All animals (except Lactation day 4 pups) will be euthanized by

exsanguination following an overexposure of inhaled carbon dioxide. Lactation day 4 pups will be euthanized using an intraperitoneal injection of sodium pentobarbital.

9.2. POSTMORTEM EXAMINATION - ANIMALS DYING DURING THE STUDY

Animals that die during the study will be given a macroscopic postmortem examination and gross lesions will be saved and preserved in 10% neutral buffered formalin. Reproductive tissues as indicated below will also be saved but no organ weights recorded. Satellite female rats dying during the study will have the number of implantation sites and corpora lutea recorded.

9.3. EUTHANASIA SCHEDULE

9.3.1. Main Study Male and Female Rats

Main Study male rats and female rats will be euthanized after at least 28 days of exposure.

9.3.2. Satellite Female Rats in the Reproduction Study

Mated Satellite female rats will be euthanized on post-partum day 4. Satellite female rats in which evidence of mating was detected but failed to deliver will be sacrificed 26 days after evidence of mating. Satellite female rats where no evidence of mating was detected and who failed to deliver will be euthanized 26 days after the completion of the mating period. Satellite female rats with total litter loss will be euthanized on post-partum day 4.

9.4. MACROSCOPIC EXAMINATION – MAIN STUDY MALE RATS

Macroscopic postmortem examinations will be performed on all Main Study male rats, including those dying spontaneously or euthanized in a moribund condition. Postmortem examinations will include examination of external surface, all orifices, cranial cavity, nasal cavity (external examination), neck and its associated tissues and organs, thoracic, abdominal and pelvic cavities and their associated tissues and organs, and external surfaces of the brain. Gross lesions or tissues with significant findings will be preserved in 10% neutral buffered formalin. If lesions are saved, corresponding tissues from several control animals may be saved for comparative purposes.

9.5. MACROSCOPIC EXAMINATIONS – FEMALE RATS

Macroscopic postmortem examinations will be performed on all Main Study and Satellite female rats, including those dying spontaneously or euthanized in a moribund condition and on Satellite female rats sacrificed after aborting or premature delivery of a litter. Postmortem examinations will include examination of external surface, all orifices, cranial cavity, nasal cavity (external examination), neck and its associated tissues and organs, thoracic, abdominal and pelvic cavities and their associated tissues and organs, and external surfaces of the brain. The number of implantation sites and corpora lutea will be recorded for each Satellite female rat. Gross lesions or tissues with significant findings will be saved in 10% neutral buffered formalin. If lesions are saved, corresponding tissues from several control animals may be saved for comparative purposes.

9.6. ORGAN WEIGHTS

Organs indicated below will be taken at the scheduled necropsy, weighed wet, recorded and organ/body and organ/brain weight ratios calculated. Organs will not be weighed for animals found dead or euthanized in a moribund condition and for those Satellite female rats not delivering pups. Prior to weighing, all organs will be carefully dissected and properly trimmed to remove fat and other contiguous tissue in a uniform manner. Organs will be weighed as soon as possible after dissection to avoid drying. Paired reproductive organs will be weighed separately. All other paired organs will be weighed together.

Main Study Male Rats	**Main Study and Satellite Female Rats**	**All Rats**	
Testes	Ovaries with Oviducts	Adrenal Glands	
Epididymides	Uterus with Vagina	Brain with Brainstem	
		Heart	Lungs
		Kidneys	Spleen
		Liver	Thymus

9.7. TISSUES PRESERVED

Tissues listed in Appendix A will be obtained at necropsy for all Main Study male and all Main Study and Satellite female rats from each exposure group and preserved in 10% neutral buffered formalin with the exception of testes and epididymides which will be preserved in a modified Davidson's fixative for at least 24 hours and then stored in 10% neutral buffered formalin. Lungs and urinary bladder will be infused with 10% neutral buffered formalin for optimal preservation.

9.8. MICROSCOPIC PATHOLOGY EVALUATIONS

Microscopic examinations for control and high exposure group Main Study male and Main Study female animals will be performed on tissues and organs as designated in Appendix A. During the microscopic examination of the testes, special emphasis will be placed on the stages of spermatogenesis and the histopathology of interstitial testicular cell structure. Note: Any abnormalities not noted during macroscopic postmortem examinations which are seen during histological processing will be recorded. If treatment-related changes are observed in the high exposure group, microscopic examinations will be performed on the animals of the low and mid exposure groups upon Sponsor approval (additional cost).

Stains: Standard stains (hematoxylin and eosin) will be used. Special stains may be employed on selected tissues to aid in making a diagnosis at the discretion of the Study Pathologist. Special stains may also be employed at the request of the Sponsor (additional cost).

9.9. MACROSCOPIC POSTMORTEM EXAMINATION - F_1 PUPS

Macroscopic postmortem examinations (internal and external) will be performed on all F_1 pups found dead during lactation. Unusual observations, including gross abnormalities and the absence of milk in the stomach, will be noted and then the carcasses will be discarded. F_1 pups found dead at birth will be identified (lung floatation test) as stillborn or alive but found dead. Macroscopic postmortem examinations (external only) will be performed on all F_1 pups on Lactation Day 4 for pups surviving to that interval. Unusual observations, including gross abnormalities, will be noted and then the carcasses will be discarded.

10. PRESERVATION OF RECORDS AND SPECIMENS

All data documenting experimental details and study procedures and observations will be recorded and maintained as raw data. At the completion of the study, all reports, raw data, preserved specimens and retained samples will be maintained in the Testing Facility's Archives for a period of 1 year after submission of the signed final report. Biological samples collected for clinical pathology will be discarded as described elsewhere in this protocol.

The Sponsor will be contacted in order to determine the final disposition of these materials. The Sponsor is responsible for all cost associated with the storage of these materials beyond 1 year from the issuance of the final report and for any costs associated with the shipment of these materials to the Sponsor or to any other facility designated by the Sponsor.

11. STATISTICAL EVALUATIONS

11.1. CONTINUOUS DATA - to include but not be limited to:

- Body weights
- Body weight changes
- Feed consumption values
- Rectal temperature
- Grip strength measurements
- Hematology and Coagulation values
- Clinical Chemistry values
- Gestation length
- Corpora lutea
- F_1 pup weights (each weighing interval during lactation)
- Number of pups (F_1 litters) per pregnant female rats
- Number of male and female pups
- Pup weight distinguished by sex and as a composite for both sexes (litter as experimental unit)
- Organ weights and organ weight to body weight and brain weight ratios

Evaluation of equality of group means will be made by the appropriate statistical method, followed by a multiple comparison test if needed. Bartlett's test (Bartlett, 1937; Sokal and Rohlf, 1995) will be performed to determine if groups have equal variances. For all FOB and clinical pathology parameters, if the variances are equal, parametric procedures will be used; if not, nonparametric procedures will be used. All other data will be analyzed only by parametric methods. The parametric method will be the standard one-way analysis of variance (ANOVA) using the F ratio to assess significance (Armitage, 1971; Dunlap and Duffy, 1975). If significant differences among the means are indicated, additional tests will be used to determine which means are significantly different from the control: Dunnett's (Dunlap et al., 1981; Dunnett, 1955, 1964), Williams (Williams, 1971, 1972), or Cochran and Cox's modified t-test (Cochran and Cox, 1959). The nonparametric method will be the Kruskal-Wallis test (Kruskal and Wallis, 1952, 1953) and if differences are indicated, Shirley's test (Shirley, 1977) or Steel's test (Steel, 1959) will be used to determine which means differ from control. Bartlett's test for equality of variance will be conducted at the 1% significance level; all other statistical tests will be conducted at the 5% and 1% significance levels.

References for these procedures are:

Armitage, P. 1971. Statistical Methods in Medical Research. Oxford, UK: Blackwell Scientific Publications; Bartlett, M.S. 1937. Properties of sufficiency and statistical tests. Proceedings of the Royal Society, Series A, 160: 268-282; Cochran, W.G. and Cox, G.M. 1959. Experimental Designs, New York: John Wiley, pp. 100-102; Dunlap, W.P. and Duffy, J.A. 1975. Fortran IV Functions for Calculating Exact Probabilities Associated with Z, Chi-Square, T and F Values. Behav. Res. Methods and Instrumentations 7:59-60; Dunlap, W.P., Marx, M.S. and Agamy, G.G. 1981. Fortran IV functions for calculating probabilities associated with Dunnett's test. Behav. Res. Methods and Instrumentation 13: 363-366; Dunnett, C.W. 1955. A multiple comparison procedure for comparing several treatments with a control. Journal of the American Statistical Association 50: 1096-1121; Dunnett, C.W. 1964. New tables for multiple comparisons with a control. Biometrics 20-3: 482-491; Kruskal, W.H. and Wallis, W.A. 1952. Use of Ranks in one-criterion variance analysis. Journal of the American Statistical Association 47: 583-621; Kruskal, W.H. and Wallis, W.A. 1953. Errata for Kruskal-Wallis (1952) Journal of the American Statistical Association 48: 907-911; Shirley, E.A.C. 1977. A non-parametric equivalent of Williams' test for contrasting increasing dose levels of a treatment. Biometrics 33: 386-389; Sokal, R.R. and Rohlf, F.J. 1995. Biometry. 3rd Edition. San Francisco: W.H. Freeman pp. 369-371; Steel, R.G.D. 1959. A multiple comparison rank sum test: treatment versus control. Biometrics 15: 560-572.; Williams, D.A. 1971. A test for differences between treatment means when several dose levels are compared with a zero dose control. Biometrics 27: 103-117; Williams, D.A. 1972. The comparison of several dose levels with a zero dose control. Biometrics 28: 519-531.

11.2. INCIDENCE DATA - to include but not be limited to:

- Mortality rate
- Mating indices, pregnancy rates, male rat fertility indices
- Litter survival indices
- Gestation indices
- Incidence of dams with no viable pups
- Mean pup survival indices (Days 0 and 4)

A Fisher Exact Test with Bonferonni correction (Seigel, S. 1956. Nonparametric Statistics for the Behavioral Sciences. New York: McGraw-Hill.) will be performed to identify differences between the control and treatment groups. All statistical tests will be conducted at the 5% and 1%, two-sided risk levels.

11.3. MOTOR ACTIVITY DATA

The data will be analyzed using split-plot repeated measures ANOVA with model terms for group, animal within group, interval and group by interval interaction. If the group x interval interaction is statistically significant (p=0.05), indicating non-parallelism in the behavioral profile between groups, a separate one-way ANOVA for group effects will be performed at each interval. If the response data passes on the parallel hypothesis, an ANOVA (using summed responses over intervals) will be used to test for the overall treatment effect which constitutes the level hypothesis. If any significant overall treatment group effect is found by any of the above ANOVAs, Dunnett's t-test will be used to find groups that differed from control. Analyses will be performed for sexes separately and combined. Treatment group effects will be deemed significant at the p=0.05 level. Plots, tables, listings, and analyses will be generated using SAS® version 8.2 for WINDOWS. Analyses will be conducted by CATO Research, 200 Westpark Corporate Center, 4364 South Alston Avenue, Durham, NC 27713-2280. The Testing Facility will be responsible for the GLP compliance of this subcontractor.

12. REPORTING

12.1. STATUS REPORTS

Periodic verbal and written updates on study progress will be provided by the Study Director. In general, written status reports will be submitted weekly and at termination of the study.

12.2. FINAL REPORT

One unbound hard copy and one electronic copy of an audited draft report will be submitted following termination of the study. After receipt and review of the Sponsor's comments, appropriate changes will be made and two hard copies and one electronic copy of a signed, final report will be issued. (Additional copies will be provided at additional cost). The report will minimally include:

12.2.1. Body of Report

- Compliance Statement (including Sponsor signature line)
- Quality Assurance Statement
- Summary
- Introduction
- Experimental Design
- Materials and Methods
- Results and Discussion

- Conclusion concerning a No-Observed-Adverse Effect Level (NOAEL)
- Statistical Procedures
- Protocol deviations and study impact statements

12.2.2. Summary Tables

- Exposures
- Mortality
- Mating indices, pregnancy rates and male rat fertility indices
- Physical in-life observations
- Mean body weight data
- Mean animal weight gain data
- Mean feed consumption data
- Mean Hematology and Coagulation
- Mean Clinical Chemistry
- Mean Functional Observation Battery
- Mean gestation length
- Mean number of corpora lutea
- Mean female rat litter data to include the number of pups (live, dead and total) at birth and number of live pups on Lactation Days 0 and 4
- Litter survival indices
- Mean litter pup survival indices (Lactation Days 0 and 4)
- Mean pup weights (Lactation Days 1 and 4)
- Mean pup sex ratio (Days 0 and 4)
- Macroscopic postmortem examination (Male Rats, Female Rats, F_1 pups)
- Mean organ weights and organ weight to body weight and brain weight ratios
- Microscopic Pathology

12.2.3. Miscellaneous

- Mating performance data
- Recent historical control data for the Testing Facility

12.2.4. Appendix Tables (Individual data)

- Mortality
- Mating indices, pregnancy rates and male rat fertility indices
- Physical in-life observations
- Individual body weight data
- Individual animal weight gain data
- Individual feed consumption data

- Individual Hematology and Coagulation
- Individual Clinical Chemistry
- Individual Functional Observation Battery
- Individual gestation length
- Individual number of corpora lutea
- Individual female rat litter data to include the number of pups (live, dead and total) at birth and number of live pups on Lactation Days 0 and 4
- Individual litter survival indices
- Individual litter pup survival indices (Days 0 and 4)
- Individual pup weights (Days 1 and 4)
- Individual macroscopic postmortem examination (Male Rats, Female Rats, F_1 pups)
- Individual organ weights and organ weight to body weight and brain weight ratios
- Individual Microscopic Pathology

12.2.5. Appendices

- Motor activity evaluation by CATO
- Personnel involved in the study
- Protocol and Amendments

A Robust Summary in IUCLID electronic format will also be separately provided by the Testing Facility's UK office.

13. REGULATORY REFERENCES

13.1. TEST GUIDELINE

This study complies with the Organization for Economic Cooperation and Development (March 22, 1996). OECD Guidelines for Testing of Chemicals; OECD Guideline 422: Combined Repeated Exposure Toxicity Study with the Reproduction/Development Toxicity Screening Test, pp. 1-14 and US EPA OPPTS Health Effects Test Guidelines 870.3650, Combined Repeated Exposure Toxicity Study with the Reproduction/Development Toxicity Screening Test, July 2000.

13.2. GOOD LABORATORY PRACTICES

This study will be conducted in compliance with Organization for Economic Cooperation and Development (OECD) Good Laboratory Practices as set forth in ENV/MC/CHEM(98)17 and EPA Good Laboratory Practices as set forth in 40 CFR Part 792 (TSCA).

13.3. ANIMAL WELFARE ACT COMPLIANCE

This study will comply with all appropriate parts of the Animal Welfare Act regulations: 9 CFR Parts 1 and 2 Final Rules, Federal Register, Volume 54, No. 168, August 31, 1989, pp. 36112-36163 effective October 30, 1989 and 9 CFR Part 3 Animal Welfare Standards; Final Rule, Federal Register, Volume 56, No. 32, February 15, 1991, pp. 6426-6505 effective March 18, 1991. The Sponsor should make particular note of the following:

1. The Sponsor's signature on this protocol documents for the study described, that there are no generally accepted non-animal alternatives and the study does not unnecessarily duplicate previous experiments.

2. All procedures used in this study have been designed to avoid discomfort, distress and pain to the animals. All methods are described in this study protocol or in written laboratory standard operating procedures.

3. Any procedures outlined in this study protocol which are expected to cause more than momentary or slight pain or distress to the animals will be performed with appropriate sedatives, analgesics or anesthetics unless the withholding of these agents is justified for scientific reasons, in writing, by the Sponsor and the Study Director and approved by the IACUC; in which case the procedure will continue for the minimum time necessary. Documentation of the justification for withholding treatment for pain or distress and IACUC approval of the procedures will be made prior to study initiation on the IACUC Protocol Review form.

4. Animals experiencing more than momentary or slight pain or distress due to test substance or emergency situations such as injury or illness will be treated by the Testing Facility's veterinarian staff with approved analgesics or agents to relieve pain. If possible, the Study Director will be consulted prior to treatment; however, the veterinary staff is authorized to administer emergency treatment as necessary. Any subsequent treatment or euthanasia will be administered after consultation with the Study Director. The Sponsor will be advised by the Study Director of all emergency situations in as timely a manner as possible.

5. Methods of euthanasia used during this study are in conformance with the above referenced regulations.

13.4. INSTITUTIONAL ANIMAL CARE AND USE COMMITTEE (IACUC)

The IACUC Protocol Review Subcommittee has reviewed this protocol and found it to be in compliance with appropriate animal welfare regulations.

14. QUALITY ASSURANCE MONITORING

The Quality Assurance Unit of Huntingdon Life Sciences (East Millstone, NJ) will monitor the facilities, equipment, personnel, methods, practices, records, raw data, draft and final reports and controls used in this study to assure that they are in conformance with this protocol, company Standard Operating Procedures and the referenced Good Laboratory Practice regulations.

15. ALTERATION OF DESIGN

Alterations of this protocol may be made as the study progresses. No changes in the protocol will be made without the consent of the Sponsor. In the event that the Sponsor authorizes a protocol change verbally, such changes will be honored by the Testing Facility and will be followed by a written verification. All protocol modifications will be signed by the Study Director and a Sponsor representative. Any modifications potentially affecting animal welfare will also be signed by two members of the Institutional Animal Care and Use Committee prior to the modification's implementation.

APPENDIX A
TISSUES PRESERVED/EXAMINED

Tissue	Tissues Preserved	Microscopic[a] Examination
Adrenal Glands	X	X
Bone (sternum/femur)[b]	X	X
Bone Marrow (rib)[c]	X	
Brain (medulla/pons, cerebrum and cerebellum)	X	X
Epididymides	X	X
Heart	X	X
Kidneys	X	X
Large Intestine (cecum, colon, and rectum)	X	X
Larynx	X	
Liver	X	X
Lungs (with mainstem bronchi)	X	X
Lymph Node (mesenteric)	X	X
Lymph Node (mediastinal)	X	X
Mammary Gland (with adjacent skin)	X	X
Nasopharynx	X	
Ovary with oviducts	X	X
Prostate	X	X
Seminal Vesicles	X	X
Small Intestine (duodenum, ileum and jejunum)	X	X
Spinal Cord (cervical, thoracic, lumbar)	X	X
Spleen	X	X
Stomach	X	X
Testes	X	X
Thymus	X	X
Thyroid with Parathyroids	X	X
Tibial Nerve	X	X
Trachea	X	X
Urinary Bladder	X	X
Uterus with Vagina	X	X
All Macroscopic Lesions and Tissue Masses	X	X

[a] Control and high exposure Main Study male and female animals. If a treatment-related change is observed in the high exposure group, microscopic examinations will be performed on the low and mid exposure groups upon Sponsor approval (additional cost).

[b] Qualitative examination (no differential count).

[c] Bone marrow smears will be prepared. They will only be evaluated (Sponsor approval, additional cost) if needed.

Protocol Amendment No. 1

Study Title: Propane: Combined Repeated-Exposure Toxicity, Reproduction and Neurotoxicity Screening in Rats via Whole-Body Inhalation Exposures

Changes

1. Detailed Physical Observations, page 12:

Revise: .....Satellite female rats will have a detailed physical observation performed weekly during the premating period and on Gestation Days 0, 7, 14, 20 and Lactation Days 0 **(except if parturition doesn't complete on the same day as it initiates)**, 1 and 4.....

2. Statistical Evaluations, page 20:

Add for Continuous Data: .....Corpora lutea **and Implantation sites, Pre-implantation** loss and Post-implantation loss.....

3. Final Report, page 22:
Add for Summary Tables:.....Mean number of corpora lutea **and Implantation sites, Pre-implantation loss and Post-implantation loss**.....

Add for Appendix Tables:.....Individual number of corpora lutea **and Implantation sites, Pre-implantation loss and Post-implantation loss**.....

4. Final Report, page 24:

Add for Appendices: **The final report for the range-finding study 03-6146 will be included.**

Reasons for Changes

1.Clarification of the observation intervals during lactation if a dam doesn't complete its delivery of pups until the morning after delivery is initiated.
2. and 3.This was an oversight in the original protocol since these parameters are required as per the relevant test guidelines.
4. As per Sponsor request.

Additional Cost Required: NO

Amendment approved by:

[redacted]

19 July 04
Date

[redacted]

July 19 2004
Date

Protocol Amendment No. 2

Study Title: Propane: Combined Repeated-Exposure Toxicity, Reproduction and Neurotoxicity Screening in Rats via Whole-Body Inhalation Exposures

Changes

Statistical Evaluations, page 20:

Add: **Exception: When 75% of the values for a clinical pathology parameter were the same, Fisher's Exact Test (Fisher, R.A. 1973. *Statistical Methods for Research Workers.* 14th edition. New York: Hafner Publishing Company) was performed followed by Mantel's test (Mantel, N. 1963. Chi-square test with one degree of freedom: extensions of the Mantel-Haenszel procedure. *Journal of the American Statistical Association* 58: 690-700).**

Reasons for Changes

Clarification of the statistical procedures.

Additional Cost Required: No

Amendment approved by:

[redacted]

17 Dec 08
Date

[redacted]

12/17/08
Date

Protocol Amendment No. 3

Study Title: Propane: Combined Repeated-Exposure Toxicity with Reproduction/Developmental Toxicity and Neurotoxicity Screening in Rats via Whole-Body Inhalation Exposures

Changes

Revise Study Title from:

Combined Repeated-Exposure Toxicity, Reproduction and Neurotoxicity Screening in Rats via Whole-Body Inhalation Exposures

to

Combined Repeated-Exposure Toxicity with Reproduction/Developmental Toxicity and Neurotoxicity Screening in Rats via Whole-Body Inhalation Exposures

Reasons for Changes

Clarification of the study title to accurately reflect the relevant OECD and EPA test guidelines as per protocol.

Note that in the final report that the study title will only be revised on the Cover Page and the Summary Page since all other pages were computer generated based on the original study title.

Amendment approved by:

[redacted]

16Nov09
Date

[redacted]

11/3/2009
Date

	Testing Facility Personnel	Appendix NN

TITLE/DEPARTMENT	NAME/DEGREE
SENIOR VICE PRESIDENT, SAFETY ASSESSMENT	[redacted]
DIRECTOR, REPRODUCTIVE AND DEVELOPMENTAL TOXICOLOGY	[redacted]
DIRECTOR, ANALYTICAL SERVICES	[redacted]
DIRECTOR, TOXICOLOGY OPERATIONS	[redacted]
DIRECTOR, QUALITY ASSURANCE	[redacted]
STUDY DIRECTOR	[redacted]
PATHOLOGIST	[redacted]
STUDY MONITOR	[redacted]
VETERINARIAN	[redacted]
MANAGER/SUPERVISOR	
Rodent and Reproductive Toxicology Inhalation Toxicology Pharmacy Analytical Services Clinical Pathology	[redacted]
Necropsy and Fetal Pathology Histology	

	Certificates of Analysis Preface	Appendix OO

Table of Contents

Feed Analysis 986
Water Analysis 1002
Bedding Analysis 1007

LabDiet PMI NUTRITION INTERNATIONAL

Return to Certified Analysis Retrieval

Product Code: 5002M
Product Desc: CERTIFIED RODENT DIET MEAL
Lab Number: L0326577-2
Lot Code: DEC 03 03 2B
Entered: 1/5/2004

Assay	Analysis	Units
PROTEIN	21.2	%
FAT ACID (HYDRO.)	5.39	%
FIBER (CRUDE)	4.48	%
ARSENIC	LESS THAN 0.2	PPM
CADMIUM	0.064	PPM
CALCIUM	0.918	%
LEAD	0.143	PPM
MERCURY	LESS THAN 0.025	PPM
PHOSPHORUS	0.639	%
SELENIUM	0.259	PPM

ORGANOPHOSPHATES	PPM	ORGANOPHOSPHATES	PPM
Diazinon	LESS THAN 0.02	Disulfoton	LESS THAN 0.02
Ethion	LESS THAN 0.02	Malathion	LESS THAN 0.02
Methyl Parathion	LESS THAN 0.02	Parathion	LESS THAN 0.02
Thimet	LESS THAN 0.02	Thiodan	LESS THAN 0.02
Trithion	LESS THAN 0.02		

PESTICIDES AND PCB	PPM	PESTICIDES AND PCB	PPM
Aldrin	LESS THAN 0.02	Alpha-BHC	LESS THAN 0.02
Beta-BHC	LESS THAN 0.02	Chlordane	LESS THAN 0.02
DDE	LESS THAN 0.02	DDT	LESS THAN 0.02
Delta-BHC	LESS THAN 0.02	Dieldrin	LESS THAN 0.02
Endrin	LESS THAN 0.02	HCB	LESS THAN 0.02
Heptachlor	LESS THAN 0.02	Heptachlor Epoxide	LESS THAN 0.02
Lindane	LESS THAN 0.02	Methoxychlor	LESS THAN 0.02

Mirex	LESS THAN 0.02	PCB	LESS THAN 0.15
AFLATOXINS	Aflatoxins	LESS THAN 5 PPB	

No notes.
For additional information, please contact:
1) Customer Service at (314) 982-1310 -- for assay methodology
2) Dr. Dorrance Haught at (314) 768-4362 -- for nutritional interpretation
3) Richmond, IN Manufacturing Plant at (765) 962-9561 -- all other questions

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LabDiet PMI NUTRITION INTERNATIONAL

Return to Certified Analysis Retrieval

Product Code: 5002M
Product Desc: CERTIFIED RODENT DIET MEAL
Lab Number: L0322569-2
Lot Code: SEP 20 03 2B
Entered: 10/3/2003

Assay	Analysis	Units
PROTEIN	21.6	%
FAT ACID (HYDRO.)	6.07	%
FIBER (CRUDE)	4.48	%
ARSENIC	0.226	PPM
CADMIUM	0.061	PPM
CALCIUM	0.907	%
LEAD	0.146	PPM
MERCURY	LESS THAN 0.025	PPM
PHOSPHORUS	0.660	%
SELENIUM	0.241	PPM

ORGANOPHOSPHATES	PPM	ORGANOPHOSPHATES	PPM
Diazinon	LESS THAN 0.02	Disulfoton	LESS THAN 0.02
Ethion	LESS THAN 0.02	Malathion	LESS THAN 0.02
Methyl Parathion	LESS THAN 0.02	Parathion	LESS THAN 0.02
Thimet	LESS THAN 0.02	Thiodan	LESS THAN 0.02
Trithion	LESS THAN 0.02		

PESTICIDES AND PCB	PPM	PESTICIDES AND PCB	PPM
Aldrin	LESS THAN 0.02	Alpha-BHC	LESS THAN 0.02
Beta-BHC	LESS THAN 0.02	Chlordane	LESS THAN 0.02
DDE	LESS THAN 0.02	DDT	LESS THAN 0.02
Delta-BHC	LESS THAN 0.02	Dieldrin	LESS THAN 0.02
Endrin	LESS THAN 0.02	HCB	LESS THAN 0.02
Heptachlor	LESS THAN 0.02	Heptachlor Epoxide	LESS THAN 0.02
Lindane	LESS THAN 0.02	Methoxychlor	LESS THAN 0.02

Mirex	LESS THAN 0.02	PCB	LESS THAN 0.15
AFLATOXINS	Aflatoxins	LESS THAN 5 PPB	

No notes.
For additional information, please contact:
1) Customer Service at (314) 982-1310 -- for assay methodology
2) Dr. Dorrance Haught at (314) 768-4362 -- for nutritional interpretation
3) Richmond, IN Manufacturing Plant at (765) 962-9561 -- all other questions

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LabDiet PMI NUTRITION INTERNATIONAL

Return to Certified Analysis Retrieval

Product Code: 5002M
Product Desc: CERTIFIED RODENT DIET MEAL
Lab Number: L0323129-3
Lot Code: OCT 01 03 1C
Entered: 10/14/2003

Assay	Analysis	Units
PROTEIN	21.8	%
FAT ACID (HYDRO.)	5.58	%
FIBER (CRUDE)	4.17	%
ARSENIC	0.611	PPM
CADMIUM	LESS THAN 0.05	PPM
CALCIUM	1.02	%
LEAD	0.131	PPM
MERCURY	LESS THAN 0.025	PPM
PHOSPHORUS	0.622	%
SELENIUM	0.211	PPM

ORGANOPHOSPHATES	PPM	ORGANOPHOSPHATES	PPM
Diazinon	LESS THAN 0.02	Disulfoton	LESS THAN 0.02
Ethion	LESS THAN 0.02	Malathion	LESS THAN 0.02
Methyl Parathion	LESS THAN 0.02	Parathion	LESS THAN 0.02
Thimet	LESS THAN 0.02	Thiodan	LESS THAN 0.02
Trithion	LESS THAN 0.02		

PESTICIDES AND PCB	PPM	PESTICIDES AND PCB	PPM
Aldrin	LESS THAN 0.02	Alpha-BHC	LESS THAN 0.02
Beta-BHC	LESS THAN 0.02	Chlordane	LESS THAN 0.02
DDE	LESS THAN 0.02	DDT	LESS THAN 0.02
Delta-BHC	LESS THAN 0.02	Dieldrin	LESS THAN 0.02
Endrin	LESS THAN 0.02	HCB	LESS THAN 0.02
Heptachlor	LESS THAN 0.02	Heptachlor Epoxide	LESS THAN 0.02
Lindane	LESS THAN 0.02	Methoxychlor	LESS THAN 0.02

Mirex	LESS THAN 0.02	PCB	LESS THAN 0.15
AFLATOXINS	Aflatoxins	LESS THAN 5 PPB	

No notes.
For additional information, please contact:
1) Customer Service at (314) 982-1310 -- for assay methodology
2) Dr. Dorrance Haught at (314) 768-4362 -- for nutritional interpretation
3) Richmond, IN Manufacturing Plant at (765) 962-9561 -- all other questions

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LabDiet PMI NUTRITION INTERNATIONAL

Return to Certified Analysis Retrieval

Product Code: 5002M
Product Desc: CERTIFIED RODENT DIET MEAL
Lab Number: L0324455-1
Lot Code: NOV 01 03 1A
Entered: 11/10/2003

Assay	Analysis	Units
PROTEIN	21.2	%
FAT ACID (HYDRO.)	5.11	%
FIBER (CRUDE)	4.91	%
ARSENIC	0.222	PPM
CADMIUM	0.054	PPM
CALCIUM	1.04	%
LEAD	0.171	PPM
MERCURY	LESS THAN 0.025	PPM
PHOSPHORUS	0.665	%
SELENIUM	0.235	PPM

ORGANOPHOSPHATES	PPM	ORGANOPHOSPHATES	PPM
Diazinon	LESS THAN 0.02	Disulfoton	LESS THAN 0.02
Ethion	LESS THAN 0.02	Malathion	LESS THAN 0.02
Methyl Parathion	LESS THAN 0.02	Parathion	LESS THAN 0.02
Thimet	LESS THAN 0.02	Thiodan	LESS THAN 0.02
Trithion	LESS THAN 0.02		

PESTICIDES AND PCB	PPM	PESTICIDES AND PCB	PPM
Aldrin	LESS THAN 0.02	Alpha-BHC	LESS THAN 0.02
Beta-BHC	LESS THAN 0.02	Chlordane	LESS THAN 0.02
DDE	LESS THAN 0.02	DDT	LESS THAN 0.02
Delta-BHC	LESS THAN 0.02	Dieldrin	LESS THAN 0.02
Endrin	LESS THAN 0.02	HCB	LESS THAN 0.02
Heptachlor	LESS THAN 0.02	Heptachlor Epoxide	LESS THAN 0.02
Lindane	LESS THAN 0.02	Methoxychlor	LESS THAN 0.02

Mirex	LESS THAN 0.02	PCB	LESS THAN 0.15
AFLATOXINS	Aflatoxins	LESS THAN 5 PPB	

No notes.
For additional information, please contact:
1) Customer Service at (314) 982-1310 -- for assay methodology
2) Dr. Dorrance Haught at (314) 768-4362 -- for nutritional interpretation
3) Richmond, IN Manufacturing Plant at (765) 962-9561 -- all other questions

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LabDiet PMI NUTRITION INTERNATIONAL

Return to Certified Analysis Retrieval

Product Code: 5002M
Product Desc: CERTIFIED RODENT DIET MEAL
Lab Number: L0326577-1
Lot Code: DEC 03 03 2A
Entered: 1/5/2004

Assay	Analysis	Units
PROTEIN	21.2	%
FAT ACID (HYDRO.)	5.92	%
FIBER (CRUDE)	4.08	%
ARSENIC	LESS THAN 0.2	PPM
CADMIUM	0.063	PPM
CALCIUM	0.898	%
LEAD	0.147	PPM
MERCURY	LESS THAN 0.025	PPM
PHOSPHORUS	0.635	%
SELENIUM	0.273	PPM

ORGANOPHOSPHATES	PPM	ORGANOPHOSPHATES	PPM
Diazinon	LESS THAN 0.02	Disulfoton	LESS THAN 0.02
Ethion	LESS THAN 0.02	Malathion	LESS THAN 0.02
Methyl Parathion	LESS THAN 0.02	Parathion	LESS THAN 0.02
Thimet	LESS THAN 0.02	Thiodan	LESS THAN 0.02
Trithion	LESS THAN 0.02		

PESTICIDES AND PCB	PPM	PESTICIDES AND PCB	PPM
Aldrin	LESS THAN 0.02	Alpha-BHC	LESS THAN 0.02
Beta-BHC	LESS THAN 0.02	Chlordane	LESS THAN 0.02
DDE	LESS THAN 0.02	DDT	LESS THAN 0.02
Delta-BHC	LESS THAN 0.02	Dieldrin	LESS THAN 0.02
Endrin	LESS THAN 0.02	HCB	LESS THAN 0.02
Heptachlor	LESS THAN 0.02	Heptachlor Epoxide	LESS THAN 0.02
Lindane	LESS THAN 0.02	Methoxychlor	LESS THAN 0.02

Mirex	LESS THAN 0.02	PCB	LESS THAN 0.15
AFLATOXINS	Aflatoxins	LESS THAN 5 PPB	

No notes.
For additional information, please contact:
1) Customer Service at (314) 982-1310 -- for assay methodology
2) Dr. Dorrance Haught at (314) 768-4362 -- for nutritional interpretation
3) Richmond, IN Manufacturing Plant at (765) 962-9561 -- all other questions

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LabDiet PMI NUTRITION INTERNATIONAL

Return to Certified Analysis Retrieval

Product Code: 5002M
Product Desc: CERTIFIED RODENT DIET MEAL
Lab Number: L0327051-1
Lot Code: DEC 10 03 2A
Entered: 1/5/2004

Assay	Analysis	Units
PROTEIN	21.2	%
FAT ACID (HYDRO.)	5.89	%
FIBER (CRUDE)	4.37	%
ARSENIC	LESS THAN 0.2	PPM
CADMIUM	LESS THAN 0.05	PPM
CALCIUM	0.890	%
LEAD	0.158	PPM
MERCURY	LESS THAN 0.025	PPM
PHOSPHORUS	0.669	%
SELENIUM	0.252	PPM

ORGANOPHOSPHATES	PPM	ORGANOPHOSPHATES	PPM
Diazinon	LESS THAN 0.02	Disulfoton	LESS THAN 0.02
Ethion	LESS THAN 0.02	Malathion	LESS THAN 0.02
Methyl Parathion	LESS THAN 0.02	Parathion	LESS THAN 0.02
Thimet	LESS THAN 0.02	Thiodan	LESS THAN 0.02
Trithion	LESS THAN 0.02		

PESTICIDES AND PCB	PPM	PESTICIDES AND PCB	PPM
Aldrin	LESS THAN 0.02	Alpha-BHC	LESS THAN 0.02
Beta-BHC	LESS THAN 0.02	Chlordane	LESS THAN 0.02
DDE	LESS THAN 0.02	DDT	LESS THAN 0.02
Delta-BHC	LESS THAN 0.02	Dieldrin	LESS THAN 0.02
Endrin	LESS THAN 0.02	HCB	LESS THAN 0.02
Heptachlor	LESS THAN 0.02	Heptachlor Epoxide	LESS THAN 0.02
Lindane	LESS THAN 0.02	Methoxychlor	LESS THAN 0.02

Mirex	LESS THAN 0.02	PCB	LESS THAN 0.15
AFLATOXINS	Aflatoxins	LESS THAN 5 PPB	

No notes.
For additional information, please contact:
1) Customer Service at (314) 982-1310 -- for assay methodology
2) Dr. Dorrance Haught at (314) 768-4362 -- for nutritional interpretation
3) Richmond, IN Manufacturing Plant at (765) 962-9561 -- all other questions

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LabDiet PMI NUTRITION INTERNATIONAL

Return to Certified Analysis Retrieval

Product Code: 5002M
Product Desc: CERTIFIED RODENT DIET MEAL
Lab Number: L0326577-1
Lot Code: DEC 03 03 2A
Entered: 1/5/2004

Assay	Analysis	Units
PROTEIN	21.2	%
FAT ACID (HYDRO.)	5.92	%
FIBER (CRUDE)	4.08	%
ARSENIC	LESS THAN 0.2	PPM
CADMIUM	0.063	PPM
CALCIUM	0.898	%
LEAD	0.147	PPM
MERCURY	LESS THAN 0.025	PPM
PHOSPHORUS	0.635	%
SELENIUM	0.273	PPM

ORGANOPHOSPHATES	PPM	ORGANOPHOSPHATES	PPM
Diazinon	LESS THAN 0.02	Disulfoton	LESS THAN 0.02
Ethion	LESS THAN 0.02	Malathion	LESS THAN 0.02
Methyl Parathion	LESS THAN 0.02	Parathion	LESS THAN 0.02
Thimet	LESS THAN 0.02	Thiodan	LESS THAN 0.02
Trithion	LESS THAN 0.02		

PESTICIDES AND PCB	PPM	PESTICIDES AND PCB	PPM
Aldrin	LESS THAN 0.02	Alpha-BHC	LESS THAN 0.02
Beta-BHC	LESS THAN 0.02	Chlordane	LESS THAN 0.02
DDE	LESS THAN 0.02	DDT	LESS THAN 0.02
Delta-BHC	LESS THAN 0.02	Dieldrin	LESS THAN 0.02
Endrin	LESS THAN 0.02	HCB	LESS THAN 0.02
Heptachlor	LESS THAN 0.02	Heptachlor Epoxide	LESS THAN 0.02
Lindane	LESS THAN 0.02	Methoxychlor	LESS THAN 0.02

Mirex	LESS THAN 0.02	PCB	LESS THAN 0.15
AFLATOXINS	Aflatoxins	LESS THAN 5 PPB	

No notes.
For additional information, please contact:
1) Customer Service at (314) 982-1310 -- for assay methodology
2) Dr. Dorrance Haught at (314) 768-4362 -- for nutritional interpretation
3) Richmond, IN Manufacturing Plant at (765) 962-9561 -- all other questions

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LabDiet PMI NUTRITION INTERNATIONAL

Return to Certified Analysis Retrieval

Product Code: 5002M
Product Desc: CERTIFIED RODENT DIET MEAL
Lab Number: L0327051-3
Lot Code: DEC 10 03 2C
Entered: 1/5/2004

Assay	Analysis	Units
PROTEIN	21.2	%
FAT ACID (HYDRO.)	5.67	%
FIBER (CRUDE)	4.01	%
ARSENIC	0.221	PPM
CADMIUM	0.057	PPM
CALCIUM	0.840	%
LEAD	0.144	PPM
MERCURY	LESS THAN 0.025	PPM
PHOSPHORUS	0.622	%
SELENIUM	0.247	PPM

ORGANOPHOSPHATES	PPM	ORGANOPHOSPHATES	PPM
Diazinon	LESS THAN 0.02	Disulfoton	LESS THAN 0.02
Ethion	LESS THAN 0.02	Malathion	LESS THAN 0.02
Methyl Parathion	LESS THAN 0.02	Parathion	LESS THAN 0.02
Thimet	LESS THAN 0.02	Thiodan	LESS THAN 0.02
Trithion	LESS THAN 0.02		

PESTICIDES AND PCB	PPM	PESTICIDES AND PCB	PPM
Aldrin	LESS THAN 0.02	Alpha-BHC	LESS THAN 0.02
Beta-BHC	LESS THAN 0.02	Chlordane	LESS THAN 0.02
DDE	LESS THAN 0.02	DDT	LESS THAN 0.02
Delta-BHC	LESS THAN 0.02	Dieldrin	LESS THAN 0.02
Endrin	LESS THAN 0.02	HCB	LESS THAN 0.02
Heptachlor	LESS THAN 0.02	Heptachlor Epoxide	LESS THAN 0.02
Lindane	LESS THAN 0.02	Methoxychlor	LESS THAN 0.02

Mirex	LESS THAN 0.02	PCB	LESS THAN 0.15
AFLATOXINS	Aflatoxins	LESS THAN 5 PPB	

No notes.
For additional information, please contact:
1) Customer Service at (314) 982-1310 -- for assay methodology
2) Dr. Dorrance Haught at (314) 768-4362 -- for nutritional interpretation
3) Richmond, IN Manufacturing Plant at (765) 962-9561 -- all other questions

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Elizabethtown Water Company
Physical & Chemical Analyses

Date January 6, 2004

General Source Raritan-Millstone Plant

Sample No. 1 Plant Delivered Water - 7:15 a.m. .1-6-04, MT

Sample No. 2

Sample No. 3

Sample No. 4

Sample No. 5

Sample No. 6

Sample No. 7

Sample No. 8

Parameter	MCL (mg/l)	1.0	2.0	3.0	4.0	5.0	6.0	7.0	8.0
Temperature * F	-	44							
Turbidity (NTU)	0.3 NTU	0.11							
Color	10 *	1							
Threshold Odor 40 * C	3 TON *	2.6/2cc							
Threshold Taste	3 TTN *	2.8							
Conductivity (micromhos / cm)	-	265							
Hardness, Total (as mg / l CaCO3)	250 mg / l *	78							
Alkalinity	-	30							
pH	6.5-8.5 *	6.9							
Chlorine, Free / Total (mg / l Cl)	-	<0.05/.74							
C[illegible]m (as mg / l CaCO3)	-	50							
Magnesium (as mg / l CaCO3)	-	28							
Iron, Total (mg / l Fe)	0.3 mg/ l *	<0.05							
Sulfates (mg / l SO4)	250 mg/ l *	33.3							
Chlorides (mg / l Cl)	250 mg/ l *	33.8							
Fluoride (mg / l F)	2 mg / l*	<0.10							
Total Dissolved Solids (mg / l)	500 mg / l *	114							
Total Suspended Solids (mg / l)	-	0.7							
Ammonia Nitrogen (mg / l N)	-	0.13							
Nitrate Nitrogen (mg / l N)	10 mg / l	1.49							
Dissolved Oxygen (mg / l O2)	-	16.1							
BOD 5 (mg / l O2)	-								
Langelier Index	+/- 1.0								
Surfactants (mg / l LAS)	0.5 mg / l *	<0.05							
Hydrogen Sulfide (mg / l H2S as S)	-	0							
Nitrite Nitrogen (mg / l N)	1 mg / l	<0.01							
Phosphate (mg / l PO3)	-	<0.05							
Manganese (mg / l MN)	0.05 mg / l *	<0.05							
T[illegible] (mg / l)	-	1.20							
	5 mg/l *								

REVIEWED
26 Jan 04

* Secondary or Recommended MCL

Laboratory Analyst: DSD

Any questions please call Water Quality Specialist- (908) 301-3163

Elizabethtown Water Company
Physical & Chemical Analyses

Date February 4, 2004

General Source Raritan-Millstone Plant

ple No. 1 Plant Delivered Water - 7:15 a.m. .2-4-04, DD

ample No. 2

Sample No. 3

Sample No. 4

Sample No. 5

Sample No. 6

Sample No. 7

Sample No. 8

Parameter	MCL (mg/l)	1.0	2.0	3.0	4.0	5.0	6.0	7.0	8.0
Temperature * F	-	38							
Turbidity (NTU)	0.3 NTU	0.11							
Color ①	10 *	11 *							
Threshold Odor 40 * C	3 TON *	2.3/1cc							
Threshold Taste	3 TTN *	2.9							
Conductivity (micromhos / cm)	-	630							
Hardness, Total (as mg / l CaCO3)	250 mg / l *	100							
Alkalinity	-	34							
pH	6.5-8.5 *	6.6							
Chlorine, Free / Total (mg / l Cl)	-	<.05/0.52							
Calcium (as mg / l CaCO3)	-	72							
esium (as mg / l CaCO3)	-	28							
Iron, Total (mg / l Fe)	0.3 mg/ l *	<0.05							
Sulfates (mg / l SO4)	250 mg/ l *	37.5							
Chlorides (mg / l Cl)	250 mg/ l *	135.9							
Fluoride (mg / l F)	2 mg / l*	<0.1							
Total Dissolved Solids (mg / l)	500 mg / l *	370							
Total Suspended Solids (mg / l)	-	0.3							
Ammonia Nitrogen (mg / l N)	-	0.07							
Nitrate Nitrogen (mg / l N)	10 mg / l	1.80							
Dissolved Oxygen (mg / l O2)	-	18.1							
BOD 5 (mg / l O2)	-								
Langelier Index	+/- 1.0	-2.39							
Surfactants (mg / l LAS)	0.5 mg / l *	-							
Hydrogen Sulfide (mg / l H2S as S)	-	0							
Nitrite Nitrogen (mg / l N)	1 mg / l	<0.10							
Phosphate (mg / l PO3)	-	<0.05							
Manganese (mg / l MN)	0.05 mg / l *	<0.05							
Zinc	5 mg/l *	0.21							
(mg / l)	5 mg/l *	1.4							

Laboratory Analyst: KK

* Secondary or Recommended MCL

REVIEWED 26 Feb04

ny questions please call Water Quality Specialist- (908) 301-3163

① Color is not a regulated parameter by Elizabethtown Water 26 Feb04

Elizabethtown Water Company
Physical & Chemical Analyses

Date March 2, 2004

General Source Raritan-Millstone Plant

nple No. 1 Plant Delivered Water - 7:30 a.m. .3-2-04, KK

Sample No. 2

Sample No. 3

Sample No. 4

Sample No. 5

Sample No. 6

Sample No. 7

Sample No. 8

Parameter	MCL (mg/l)	1.0	2.0	3.0	4.0	5.0	6.0	7.0	8.0
Temperature * F	-	43							
Turbidity (NTU)	0.3 NTU	0.01							
Color	10 *	1							
Threshold Odor 40 * C	3 TON *	2.8/2cc							
Threshold Taste	3 TTN *	2.5							
Conductivity (micromhos / cm)	-	331							
Hardness, Total (as mg / l CaCO3)	250 mg / l *	100							
Alkalinity	-	45							
pH	6.5-8.5 *	6.8							
Chlorine, Free / Total (mg / l Cl)	-	<.05/0.60							
ium (as mg / l CaCO3)	-	60							
Magnesium (as mg / l CaCO3)	-	40							
Iron, Total (mg / l Fe)	0.3 mg/ l *	<0.05							
Sulfates (mg / l SO4)	250 mg/ l *	36.0							
Chlorides (mg / l Cl)	250 mg/ l *	48.2							
Fluoride (mg / l F)	2 mg / l*	<0.1							
Total Dissolved Solids (mg / l)	500 mg / l *	186							
Total Suspended Solids (mg / l)	-	0.3							
Ammonia Nitrogen (mg / l N)	-	0.08							
Nitrate Nitrogen (mg / l N)	10 mg / l	1.50							
Dissolved Oxygen (mg / l O2)	-	14.1							
BOD 5 (mg / l O2)	-								
Langelier Index	+/- 1.0	-2.04							
Surfactants (mg / l LAS)	0.5 mg / l *	-							
Hydrogen Sulfide (mg / l H2S as S)	-	0							
Nitrite Nitrogen (mg / l N)	1 mg / l	<0.10							
Phosphate (mg / l PO3)	-	0.13							
Manganese (mg / l MN)	0.05 mg / l *	<0.05							
[illegible]	5 mg/l *	0.14							
C. (mg / l)	5 mg/l *	1.8							

Laboratory Analyst: MT/AW/JP

REVIEWED 25 March

* Secondary or Recommended MCL

Any questions please call Water Quality Specialist- (908) 301-3163

BENCHMARK ANALYTICS
4777 SAUCON CREEK ROAD
CENTER VALLEY, PA 18034-9004

PHONE (610) 974-8100
FAX (610) 974-8104

SEND DATA TO:

NAME:	Terry Kusznir	INV #:	318294,318298
COMPANY:	Huntingdon Life Sciences		381302
ADDRESS:	PO Box 2360, Mettlers Road	PAGE:	2 OF 6
	East Millstone, NJ 08875-2360		
		PO #:	
PHONE:	(732) 873-2550 x 2100		
FAX:	(732) 873-3992	PWS ID#:	

TEST REPORT

PROJECT NAME:	ANIMAL DRINKING WATER	GRAB SAMPLES:	318294,298,302
SAMPLED BY:	ALLISON HAMMAR	COMPOSITE SAMPLES:	NONE
LOCATION:	SEE BELOW	DATE RECEIVED BY LAB:	01/23/04
DATE:	01/22/04	TIME RECEIVED BY LAB:	0930
TIME:	SEE BELOW	RECEIVED FOR LAB BY:	J. ALTEMOSE

SAMPLE: SITE #4, L WING ROOM 456 TIME: 1555

TEST	RESULT	UNITS	METHOD	INV #	START DATE	START TIME	END DATE	INIT.
COPPER	0.019	MG/L	EPA 200.7	318294	01/26/04	0800	01/26/04	GR
LEAD	<0.002 *	MG/L	EPA 200.9	318294	01/26/04	0800	01/26/04	KFW

SAMPLE: SITE #5, V-1 ROOM 721 TIME: 1540

TEST	RESULT	UNITS	METHOD	INV #	START DATE	START TIME	END DATE	INIT.
COPPER	0.011	MG/L	EPA 200.7	318298	01/26/04	0800	01/26/04	GR
LEAD	<0.005 *	MG/L	EPA 200.9	318298	01/26/04	0800	01/26/04	KFW

SAMPLE: SITE #6, INHALATION ROOM 812 TIME: 1602

TEST	RESULT	UNITS	METHOD	INV #	START DATE	START TIME	END DATE	INIT.
COPPER	0.015	MG/L	EPA 200.7	318302	01/26/04	0800	01/26/04	GR
LEAD	<0.005 *	MG/L	EPA 200.9	318302	01/26/04	0800	01/26/04	KFW

REVIEWED
T 13 Feb 04

REMARKS:

* LIMIT OF DETECTION INCREASED DUE TO MATRIX INTERFERENCE AND SPIKE RECOVERY DATA.

THE ABOVE TEST RESULTS MEET ALL THE REQUIREMENTS OF NELAC.

MANAGER: Stephanie Olesa DATE: Feb 3, 2004

BENCHMARK ANALYTICS
4777 SAUCON CREEK ROAD
CENTER VALLEY, PA 18034-9004

PHONE (610) 974-8100
FAX (610) 974-8104

SEND DATA TO:

NAME:	Terry Kusznir	INV #:	318299-318301
COMPANY:	Huntingdon Life Sciences		318303-318305
ADDRESS:	PO Box 2360, Mettlers Road	PAGE:	5 OF 6
	East Millstone, NJ 08875-2360		
		PO #:	
PHONE:	(732) 873-2550 x2100		
FAX:	(732) 873-3992 **TEST REPORT**	PWS ID#:	

PROJECT NAME:	ANIMAL DRINKING WATER	GRAB SAMPLES:	318299-318301
SAMPLED BY:	ALLISON HAMMAR		318303-318305
LOCATION:	SEE BELOW	COMPOSITE SAMPLES:	NONE
DATE:	01/22/04	DATE RECEIVED BY LAB:	01/23/04
TIME:	SEE BELOW	TIME RECEIVED BY LAB:	0930
		RECEIVED FOR LAB BY:	J. ALTEMOSE

SAMPLE: SITE #5, V-1 ROOM 721 TIME: 1540

TEST	RESULT	UNITS	METHOD	INV #	START DATE	START TIME	END DATE	INIT.
PSEUDOMONAS	<1	PER 100 ML	SM#19 9215 B	318299	01/23/04	1420	01/24/04	DNG
ST DARD PLATE COUNT	46	CFU/ML	SM#19 9215 B	318300	01/23/04	1415	01/25/04	JLS
TOTAL COLIFORM	0	PER 100 ML	EPA 600-R-00-013	318301	01/23/04	1305	01/24/04	DNG
E. COLI	0	PER 100 ML	EPA 600-R-00-013	318301	01/23/04	1305	01/24/04	DNG

SAMPLE: SITE #6, INHALATION ROOM 812 TIME: 1602

TEST	RESULT	UNITS	METHOD	INV #	START DATE	START TIME	END DATE	INIT.
PSEUDOMONAS	<1	PER 100 ML	SM#19 9215 B	318303	01/23/04	1420	01/24/04	DNG
STANDARD PLATE COUNT	<1	CFU/ML	SM#19 9215 B	318304	01/23/04	1415	01/25/04	JLS
TOTAL COLIFORM	0	PER 100 ML	EPA 600-R-00-013	318305	01/23/04	1305	01/24/04	DNG
E. COLI	0	PER 100 ML	EPA 600-R-00-013	318305	01/23/04	1305	01/24/04	DNG

REMARKS:

REVIEWED
13 Feb 04

THE ABOVE TEST RESULTS MEET ALL THE REQUIREMENTS OF NELAC.

MANAGER: Stephanie Olsen DATE: Feb 3, 2004

NAMSA
Ensuring Medical Device Safety and Compliance™

Corp. Hdqtrs: 2261 Tracy Road, Northwood, OH 43619-1397 / 419.666.9455 / Fax 419.666.2954
3400 Cobb International Blvd., Kennesaw, GA 30152-7601 / 770.427.3101 / Fax 770.426.5692
9 Morgan, Irvine, CA 92618-2078 / 949.951.3110 / Fax 949.951.3280
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MS005_00P

Ted Weaver
The Andersons
PO Box 119
Maumee , OH 43537

Lab No. 03T_22579_01
P.O. No. Ted Weaver
Test Facility: NAMSA
6750 Wales Road
Northwood, OH 43619

STERILITY TEST

Test Article: Bed O' Cobs 425RB
ID No. Lot: MK1703, Run #And6030036
Procedure/Test Method: S-20431-01-00/Immersion
Test Article Received: November 24, 2003
Test Start Date: November 24, 2003
Test Termination Date: December 8, 2003
Number of Products Tested:

STERILITY TEST RESULTS
Test Article Identity Maintained as Submitted by Client

Articles Tested	Number of Articles Tested	Type of Media	Incubation Temperature (Degrees C)	Number of Days Incubated	Number of Positive Articles
Product Section	1	SCDB-400 ml	20-25	14	0
Product Section	1	FTM-400 ml	30-35	14	0

SCDB = Soybean Casein Digest Broth FTM = Fluid Thioglycollate Medium

Results and conclusions apply only to the test article tested. No further evaluation of these results is made by NAMSA. Any extrapolation of these data to other samples is the responsibility of the sponsor. All procedures were conducted in conformance with good laboratory practice and ISO 17025.

Record Storage: All raw data pertaining to this study and a copy of the final report are to be retained in designated NAMSA archive files for a period of 5 years.

EXACT PHOTO COPY OF ORIGINAL
INIT. JMD DATE 12Feb04

cal Date Completed 12-8-03 Approved By

Michelle R. Pierce
Manager, Microbiology

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Sterigenics * 305 Enterprise Drive * Westerville, Ohio 43081 * USA *
614-888-4077 * FAX 614-888-4223 * www.sterigenics.com

Certificate of Processing

acility: Westerville
ustomer Name: The Anderson Inc.
ustomer PO #:
un Date: 11/11/03
un Number: **AND01 AND 6030036**
otal Pallets: 22

Cell: Production A
Date Format: MM/DD/YY
Customer Ref:

ATERIALS PROCESSED:

Qty	Product	Description	Lot Number	LOT #
1,760	BED'O COB 1/4" BAG	10/TOTE 23.75 X 11.75 X 8"	425RB	MK1703
1	SAMPLE-506		425RB	MK1703
1,761 Bags		Total		

Minimum Dose: 27.4 kGy
Maximum Dose: 50.7 kGy

Sterigenics certifies that the materials listed above (as described by its manufacturer) received the indicated doses within the precision and accuracy of the dosimetry system employed:

Certified By: [signature]
Date: 11/13/03

ISO 9001:2000 REGISTERED

Original

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Corp. Hdqtrs: 2261 Tracy Road, Northwood, OH 43619-1397 / 419.666.9455 / Fax 419.666.2954
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MS005-FEE

Lab No. 03T 10650 00
P.O. No. TED WEAVER

TED WEAVER
THE ANDERSONS INC.
PO BOX 119
MAUMEE, OH 43537-1639

ID No. Lot: DH143

STERILITY TEST

Test Article:	¼" Bed O'Cobs 425URB Run #6030024
Procedure/Test Method:	S-00165-01-00/Immersion
Test Article Received:	8-28-03
Test Start Date:	8-29-03
Test Termination Date:	9-12-03
Number of Products Tested:	1

STERILITY TEST RESULTS

Test Article Identity Maintained as Submitted by Client

Articles Tested	Number of Articles Tested	Type of Media	Incubation Temperature (Degrees C)	Number of Days Incubated	Number of Positive Articles
Product Section	1	SCDB-400 ml	20-25	14	0
Product Section	1	FTM-400 ml	30-35	14	0

SCDB = Soybean Casein Digest Broth FTM = Fluid Thioglycollate Medium

Results and conclusions apply only to the test article tested. No further evaluation of these results is made by NAMSA. Any extrapolation of these data to other samples is the responsibility of the sponsor. All procedures were conducted in conformance with good laboratory practice and ISO 17025.

Record Storage: All raw data pertaining to this study and a copy of the final report are to be retained in designated NAMSA archive files.

Test Facility: NAMSA, 2261 Tracy Road, Northwood, OH 43619-1397.

cal Date Completed 9-12-03 Approved By _____
Michelle R. Pierce

Authorization for duplication of this report, except in whole, is reserved pending NAMSA's written approval.

Sterigenics * 305 Enterprise Drive * Westerville, Ohio 43082 USA *
614-888-4077 * FAX 614-888-4223 * www.sterigenics.com

GUARDIAN
the IBA Group

Certificate of Processing

Facility: Westerville
Customer Name: The Anderson Inc.
Customer PO #:
Run Date: 08/22/03
Run Number: **AND01 AND 6030024**
Total Pallets: 21

Cell: Production A
Date Format: MM/DD/YY
Customer Ref:

MATERIALS PROCESSED:

Qty	Product	Description	Lot Number	LOT #
400	BED'O COB 1/8" BAG	10/TOTE	DH133	825RB
80	BED'O COB 1/8" BAG	10/TOTE	DG033	825RB
1	SAMPLE-504		DH133	825RB
1,200	BED'O COB 1/4" BAG	10/TOTE 23.75 X 11.75 X 8"	DH143	425RB
1	SAMPLE-506		DH143	425RB
1,682 Bags	Total			

Minimum Dose: 29.2 kGy
Maximum Dose: 50.3 kGy

IBA certifies that the materials listed above (as described by its Manufacturer) received the indicated doses within the precision and accuracy of the dosimetry system employed:

Certified By: Linda P. Hughes

Date: 08/25/03

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	Report Amendments	Appendix PP

There are no amendments for this report at this time.